PLAN BAY AREA 2050+

DRAFT ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE #2025010348

OCTOBER 2025

ASSOCIATION OF BAY AREA GOVERNMENTS

METROPOLITAN TRANSPORTATION COMMISSION

PLAN BAY AREA 2050+

DRAFT ENVIRONMENTAL IMPACT REPORT

State Clearinghouse Number 2025010348

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ACRONYMS AND ABBREVIATIONS

µg	micro grams
µPa	micro-Pascals
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACE	Altamont Corridor Express
ACWD	Alameda County Water District
AFY	acre feet per year
AIA	airport influence area
AIRFA	American Indian Religious Freedom Act of 1978
ALUC	Airport Land Use Commission
ALUCP	Airport Land Use Compatibility Plan
APS	Alternative Planning Strategy
ARPA	Archeological Resources Protection Act of 1979
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
ATCM	Airborne Toxic Control Measure
ATP	Active Transportation Program
BAAQMD	Bay Area Air Quality Management District
BACT	best available control technology
BAIFA	Bay Area Infrastructure Financing Authority
BARR	Bay Area Regional Reliability
BART	Bay Area Rapid Transit
BASMAA	Bay Area Stormwater Management Agencies Association
BATA	Bay Area Toll Authority
BAWSCA	Bay Area Water Supply & Conservation Agency
Bay Region	San Francisco Bay Hydrologic Region
BCDC	Bay Conservation and Development Commission
BMP	best management practices
BP	Before Present
C&D	construction and demolition
CAA	Clean Air Act
CAAQS	California ambient air quality standards
Cal EMA	California Emergency Management Agency
CAL FIRE	California Department of Forestry and Fire Projection
Cal OES	California Governor’s Office of Emergency Services
CalARP	California Accidental Release Prevention Program
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency

CALGreen	California Green Building Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resource Board
CARE	Community Air Risk Evaluation
CASQA	California Stormwater Quality Association
CBC	California Building Code
CBP	Commuter Benefits Program
CBTP	Community-Based Transportation Plan
CCA	Community Choice Aggregations
CCWD	Contra Costa Water District
CDE	California Department of Education
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CESA	California Endangered Species Act
CFC	California Fire Code
CGS	California Geological Survey
CHHSL	California Human Health Screening Levels
CHP	California Highway Patrol
CLN	Conservation Land Network
CMA	Congestion Management Agencies
CMP	Congestion Management Plans
CMRA	Construction Materials Recycling Association
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO_2	carbon dioxide
CPP	corridor protection program
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CRRP	Community Risk Reduction Plan
CTA	County Transportation Agencies
CTC	California Transportation Commission
CTMP	Comprehensive Truck Management Plan
CTP	Countywide Transportation Plans
CUPA	Certified Uniform Program Agencies
CVP	Central Valley Project
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibels

Delta	Sacramento–San Joaquin Delta
diesel PM	diesel particulate matter
DMA 2000	Disaster Mitigation Act of 2000
DOF	Department of Finance
DOT Act	U.S. Department of Transportation Act
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPS	distinct population segment
DSC	Delta Stewardship Council
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EACCS	East Alameda County Conservation Strategy
EBMUD	East Bay Municipal Utility District
ECA	Essential Connectivity Areas
ECCC HCP/NCCP	East Contra Costa County HCP and NCCP
ECCID	East Contra Costa Irrigation District
EFH	essential fish habitat
EIR	Environmental impact reports
EISA	Energy Independence and Security Act
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act
EPCRA	Emergency Planning Community Right-to-Know Act
ESA	Endangered Species Act
ESU	evolutionarily significant unit
EV	electric vehicle
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FPA	Z'berg-Nejedly Forest Practice Act
FPI	Freeway Performance Initiative
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
FSP	Freeway Service Patrol
FTA	Federal Transit Administration
GHG	greenhouse gas
GIS	geographic information system
GSA	Groundwater Sustainability Agency

GSP	Groundwater Sustainability Plans
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HALS	Historic American Landscape Survey
HCD	California Department of Housing and Community Development
HCP	Habitat Conservation Plan
HCP/NCCP	Habitat Conservation Plan/Natural Community Conservation Plans
HDVIP	Heavy-Duty Vehicle Inspection Program
HEPA	high efficiency particulate air
HMTA	Hazardous Materials Transportation Act
HOV	High Occupancy Vehicle
HRA	High Resource Areas
HUD	U.S. Department of Housing and Urban Development
HVAC	heating, ventilation and air conditioning
Hz	hertz
I-	Interstate
IBC	International Building Code
IFC	International Fire Code
in/sec	inches/second
IPaC	Information for Planning and Consultation
IPM	integrated pest management
ISO	International Organization for Standardization
ISR	indirect source review
IWMA	Waste Management Act of 1989
kw	kilowatts
LAFCo	local agency formation commission
LCFS	Low Carbon Fuels Standard
LCP	local coastal programs
Ldn	Day-Night Average Level
LEA	local educational agency
Leq	Equivalent Sound Level
L_{eq}[h	A-weighted equivalent sound level
LID	low-impact development
L_{max}	Maximum Sound Level
Ln	Percentile-Exceeded Sound Level
LOS	level of service
LRA	Local Responsibility Areas
m^3	cubic meter
MAQIP	Maritime Air Quality Improvement Plan
MCA	mitigation credit agreements

MERV	minimum efficiency reporting value
mgd	million gallons per day
MLD	most likely descendant
MMI	Modified Mercalli Intensity
MMWD	Marin Municipal Water District
MPO	metropolitan planning organization
MS4	municipal separate storm sewer systems
MTC	Metropolitan Transportation Commission
$MTCO_2e$	metric tons of carbon dioxide equivalent
MWELO	Model Water Efficient Landscape Ordinance
NAAQS	national ambient air quality standards
NAC	Noise Abatement Criteria
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NEHRP	National Earthquake Hazard Reduction Program
NEPA	National Environmental Policy Act of 1969
NFIP	National Flood Insurance Program
NGA	Natural Gas Act
NHPA	National Historic Preservation Act of 1966
NHTSA	National Highway Traffic Safety Administration
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	Naturally occurring asbestos
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NOP	Notice of Preparation
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSCAPCD	Northern Sonoma County Air Pollution Control District
NWIC	Northwest Information Center
OBAG	One Bay Area Grant program
OEHHA	Office of Environmental Health Hazard Assessment
OES	California Office of Emergency Services
OPR	Governor's Office of Planning and Research
OSPR	Office of Spill Prevention and Response
ozone	photochemical smog
PCA	Priority Conservation Areas
PCB	polychlorinated biphenyls
PDA	Planned Development Areas
PEV	Plug-in Electric Vehicles

PG&E	Pacific Gas and Electric Company
PM	Particulate matter
$PM_{2.5}$	fine particulate matter
PPA	Priority Production Areas
ppb	parts per billion
PPV	peak particle velocity”
PRMP	paleontological resource management plan
PSDC	Project Specific Design Criteria
PSIP	Periodic Smoke Inspection Program
PUA	Priority Use Area
PURPA	Public Utility Regulatory Policies Act
RCA	regional conservation assessments
RCIS	regional conservation investment strategies
RCRA	Resource Conservation and Recovery Act of 1976
RECP	Regional Emergency Coordination Plan
RFS	Renewable Fuel Standard
RHNA	Regional Housing Need Allocation
RMS	root-mean-square
ROG	Reactive Organic Gases
ROW	rights-of-way
RPF	Registered Professional Forester
RPS	Renewables Portfolio Standard
RTP	range transportation plans
RTPA	Regional Transportation Planning Agencies
RWQCB	Regional Water Quality Control Board
SAFE	Safer Affordable Fuel-Efficient
SARA	Superfund Act and Reauthorization Act of 1986
SB	Senate Bill
SBE	State Board of Education
SCEA	Sustainable Communities Environmental Assessment
SCS	Sustainable Communities Strategy
SCVHP	Santa Clara Valley Habitat Plan
SCVWD	Santa Clara Valley Water District
SCWA	Solano County Water Agency
SDC	Seismic Design Criteria
SEL	Single-Event Noise Level
SEMS	Standard Emergency Management System
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Plans
SLCP	short-lived climate pollutants
SMARA	Surface Mining and Reclamation Act

SMART	Sonoma Marin Area Rail Transit
SMGB	State Mining and Geology Board
SO_2	sulfur dioxide
SO_X	sulfur oxide
SPL	sound pressure level
SR	State Route
SRA	State Responsibility Areas
SWAP	Shared Water Access Program
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TAF	Transportation Analysis Framework
TCM	transportation control measures
TDM	Transportation demand management
THP	Timber Harvest Plan
TMDL	Total Maximum Daily Load
TNC	transportation network companies
TOD	Transit Oriented Development
TPA	Transit Priority Area
TPP	transit priority projects
TPZ	Timberland Production Zones
TRA	Transit Rich Areas
UCMP	University of California Museum of Paleontology
UHI	urban heat island”
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	United States Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	velocity level in decibels
VDECS	Verified Diesel Emissions Control Strategy
VMT	vehicle miles traveled
VTA	Santa Clara Valley Transportation Authority
WDR	waste discharge requirements
WSA	water supply assessment
WUI	wildland-urban interface
YSAQMD	Yolo-Solano Air Quality Management District
ZEV	Zero Emission Vehicles

EXECUTIVE SUMMARY

INTRODUCTION

This summary is provided in accordance with the State California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations [CCR] Section 15123). As stated in the State CEQA Guidelines (CCR Section 15123[a]), "an environmental impact report (EIR) shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." As required by the State CEQA Guidelines, this section includes: (1) a summary description of the proposed plan; (2) a synopsis of environmental impacts and recommended mitigation measures; (3) identification of the alternatives evaluated and discussion of the environmentally superior alternative; (4) a discussion of the areas of controversy associated with the project; and (5) issues to be resolved, including the choice among alternatives.

INTRODUCTION TO THE EIR

SUMMARY DESCRIPTION OF THE PROJECT

Background

LOCATION

The San Francisco Bay Area region includes nine counties that may be aggregated geographically into four subareas: North Bay (Marin, Napa, Solano, and Sonoma Counties), East Bay (Alameda and Contra Costa Counties), South Bay (Santa Clara County), and the West Bay (San Francisco and San Mateo Counties). There are 101 cities spread throughout these nine counties. The total area of the region is approximately 4.4 million acres (7,000 square miles). The region is bordered by Mendocino, Lake, and Yolo Counties to the north; Sacramento, San Joaquin, Stanislaus, and Merced Counties to the east; San Benito, Monterey, and Santa Cruz Counties to the south; and the Pacific Ocean to the west. As of January 2024, the region had a population estimate of 7.59 million, which is approximately 19% of California's population. Roughly 18% of the region's approximately 4.4 million acres were developed as of 2022 (see **Table 2-3** in Chapter 2, "*Project Description*"). The undeveloped area includes open space and agricultural lands, as well as water bodies (excluding the San Francisco Bay) and parks.

MTC, ABAG, AND PLAN BAY AREA

MTC was formed in 1970 and functions under State and federal law as the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. It covers the same geographic area as the Association of Bay Area Governments (ABAG). MTC is the federally designated metropolitan planning organization (MPO) and the State-designated regional transportation planning agency (RTPA) for the Bay Area. It is responsible for preparing and updating the Regional Transportation Plan (RTP) every 4 years.

ABAG was formed in 1961 by a joint powers agreement among Bay Area local governments and serves as the comprehensive regional planning agency and Council of Governments for the nine counties and 101 cities and towns of the San Francisco Bay region. It is a public entity created by local governments to meet their planning

and research needs related to land use and is responsible under State law for conducting the Regional Housing Needs Allocation (RHNA) process. ABAG also hosts several joint powers and administrative entities related to environmental and water resource protection, disaster resilience, energy efficiency, hazardous waste mitigation, financial services, and staff training to local counties, cities, and towns. It is responsible for preparing and updating the Sustainable Communities Strategy (SCS) every 4 years.

The most recent RTP/SCS for the Bay Area—Plan Bay Area 2050—was adopted in 2021. As the Bay Area's third RTP to include an SCS, the 2021 plan was considered a "major" update of Plan Bay Area 2040, adopted in 2017, as it accompanied a concurrent RHNA cycle. The proposed plan serves as the fourth RTP/SCS for the Bay Area and is a limited and focused update to Plan Bay Area 2050 and does not accompany a RHNA cycle. The proposed plan continues the framework of Plan Bay Area 2050 and focuses on four interrelated elements—transportation, housing, the economy, and the environment. The proposed plan is composed of 35 integrated strategies across the four elements that provide a blueprint for how the Bay Area can accommodate future growth and make the region more equitable and resilient and achieve regional greenhouse gas (GHG) emissions reduction targets established by the California Air Resources Board (CARB) pursuant to Senate Bill (SB) 375. As required by State law (Government Code Section 65080 et seq.) and by federal law (Title 23 U.S. Code Section 134), MTC is responsible for preparing the RTP for the San Francisco Bay Area region. The plan meets all State and federal requirements for an RTP/SCS.

Once adopted by MTC and ABAG, Plan Bay Area 2050+ will guide regional transportation, housing, economic, and environmental strategies and investments for the region. For additional background on Plan Bay Area 2050, see Section 1.7, "Plan Bay Area 2050+ Background" in Chapter 1, "Introduction."

PURPOSE OF THIS EIR

This EIR has been prepared in compliance with the CEQA Statutes and Guidelines. In general, the purpose of an EIR is to:

- analyze the potential environmental effects of the adoption and implementation of the proposed plan;
- inform decision-makers, responsible and trustee agencies, and members of the public as to the range of the environmental impacts of the proposed plan;
- impose mitigation measures to mitigate significant adverse impacts; and
- analyze a range of reasonable alternatives to the proposed plan.

The final EIR will include a mitigation, monitoring, and reporting program that identifies who will be responsible for implementing identified mitigation measures and the required timing for implementation. For some impacts, mitigation measures are commitments by MTC and ABAG. For most impacts, MTC and ABAG do not have regulatory or approval authority over future projects. In those cases, MTC and ABAG identify specific mitigation measures for application by the lead agency. In order to rely on this EIR to streamline environmental review for an individual project, the lead agency must require the applicable mitigation measures (or equally effective measures) as a part of the project-level environmental review. These commitments would obligate project sponsors to implement measures that would minimize or eliminate significant impacts pursuant to CEQA. As the joint lead agencies for preparing this EIR, MTC and ABAG will rely on the EIR analysis of potential environmental effects in their review and consideration of the proposed plan before approval.

As discussed in further detail below in Section 1.9, "CEQA Streamlining Opportunities," SB 375 provides streamlining benefits for certain transit-oriented projects consistent with an adopted SCS. Pursuant to these provisions of SB 375, this EIR has also been prepared to allow qualifying projects to streamline their environmental review.

EIR SCOPE

This is a program EIR, which is defined in Section 15168 of the CEQA Guidelines as an EIR addressing a series of actions that can be characterized as one large project and are related either:

(1) geographically;

(2) as logical parts in the chain of contemplated actions;

(3) in connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or

(4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts which can be mitigated in similar ways.

A program EIR can be used as the basic, general environmental assessment for an overall program of projects developed over a multi-year planning horizon and therefore is an appropriate review document for the proposed plan. A program EIR has several advantages. For example, it provides a basic reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. It also allows the lead agency to consider the broad, regional impacts of a program of actions before its adoption and eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts.

LEVEL OF ANALYSIS

This EIR presents a programmatic assessment of the potential impacts of the proposed plan, focusing on the entire set of the strategies contained in the proposed plan. Individual transportation, sea level rise adaptation, and land use development project impacts are not addressed in detail. The analysis focuses on these three categories of projects at the local (county) and regional (Bay Area) level. Impacts are analyzed from a regional and local perspective, as applicable.

For location-based impact assessments, geographic information system (GIS) was used to digitally overlay onto resource-related data, the footprint of the proposed plan associated with the forecasted land use growth footprint and footprints of sea level rise adaptation projects and transportation projects. Results are presented for the region and, where relevant, for each county. Where impacts are quantified through modeling or GIS analysis, they are reported at the regional and/or county level in tables and in the text. Information provided by county includes both incorporated and unincorporated areas in the county. The plan's Growth Geographies are geographic areas to guide where future growth in housing and jobs would be focused, they are not intended to estimate areas of potential land conversion. Additionally, future development is not solely limited to Growth Geographies, instead they are places likely to accommodate the majority of new residents and jobs. Therefore, this EIR uses the land use growth footprint and the footprints for development of sea level rise adaptation projects and transportation projects to capture impacts from the proposed plan.

The analysis in this EIR does not evaluate project-specific impacts of individual projects, although it provides environmental analysis and mitigation that is intended to address the range of impacts that may be associated with individual projects. This approach does not relieve local jurisdictions of responsibility for determining whether project-specific impacts require additional CEQA analysis; see Section 1.8, "Future Environmental Review," below, for more details.

EIR Organization

EXECUTIVE SUMMARY

The executive summary in this EIR outlines the proposed plan and alternatives and includes a summary of the potentially significant adverse environmental impacts of the proposed plan, the measures identified to mitigate those impacts, and an overview of whether or not identified measures would mitigate the significant impacts and to what level. The executive summary also discusses the environmentally superior alternative, and identifies "areas of controversy" and "issues to be resolved" as required by CEQA.

CHAPTER 1: INTRODUCTION

Chapter 1, "Introduction," describes the relationship between the proposed plan and the EIR, the organization of the EIR, and the basic legal requirements of a program-level EIR. It discusses the level of analysis and the alternatives considered, as well as how this EIR is related to other environmental documents and the EIR's intended uses. This is followed by more content on the regional setting and regulatory framework that provides the context for the proposed plan. This background information is followed by a discussion of plan development and public engagement processes, as well as planning assumptions.

CHAPTER 2: PROJECT DESCRIPTION

Chapter 2, "Project Description," describes the proposed plan and the project objectives and includes a discussion on planning assumptions and the plan's strategies and resulting forecasted changes.

SECTIONS 3.1 THROUGH 3.15: ENVIRONMENTAL ANALYSIS

The sections of Chapter 3 present the environmental analysis of the proposed plan. Section 3.1 provides an overview of the approach to the environmental analysis. Sections 3.2 through 3.15 describe the existing physical and regulatory settings for each of the environmental issue areas analyzed in this EIR, the potential impacts of the proposed plan on these environmental issue areas, and measures to mitigate the significant and potentially significant impacts identified. Each issue area is analyzed in a separate section, and each section is organized into the following subsections:

- "Environmental Setting,"
- "Regulatory Setting,"
- "Impact Analysis" which includes,
  - "Significance Criteria,"
  - "Method of Analysis," and
  - "Impacts and Mitigation Measures."

CHAPTER 4: ALTERNATIVES

Chapter 4 contains a description and analysis of the alternatives to the proposed plan. It provides an initial assessment of the potential of each alternative to achieve the objectives of the proposed plan while reducing potentially significant adverse environmental impacts. This discussion also includes a comparison summary table of regional environmental impacts associated with the alternatives, and information regarding the environmentally superior alternative.

CHAPTER 5: OTHER CEQA-MANDATED SECTIONS

Chapter 5 includes an assessment of the impacts of the proposed plan in several subject areas required by CEQA:

- significant irreversible environmental changes,
- significant and unavoidable impacts,
- growth-inducing impacts,
- cumulative impacts, and
- impacts found not to be significant.

Chapter 6: Report Preparers

Chapter 6 contains a list of report authors and others consulted for preparation of this EIR.

Chapter 7: References

Chapter 7 lists the references used to support preparation of this EIR.

APPENDICES

Appendix A includes the Notice of Preparation of this EIR, and Appendix B includes the comments received on the Notice of Preparation and at the scoping meetings, as well as the Scoping Summary Report. Appendix C includes special-status species data. Appendix D includes modeling outputs for air quality, GHG emission and energy modeling. Appendix E presents input and output data used for the impact analyses in Section 3.12, "Noise."

Project Objectives

The proposed plan's adopted vision is to ensure the Bay Area is affordable, connected, diverse, healthy, and vibrant for all by the year 2050. To support this vision, MTC and ABAG developed guiding principles and performance measures in conjunction with members of the public, partners, and elected officials. In addition, SB 375 mandates two performance targets related to housing all economic segments of the population and reducing per-capita GHG emissions from cars and light-duty trucks. Together, the guiding principles and performance metrics serve as the basis for the following CEQA objectives:

1. Address climate change by reducing carbon dioxide (CO_2) emissions pursuant to targets established by the CARB; specifically, meet or exceed a 19% reduction in per-capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels.
2. House 100% of the region's projected growth by income level, and with no increase in in-commuters over the proposed plan baseline year.
3. Ensure that all current and future Bay Area residents and workers have sufficient housing options they can afford by reducing how much residents spend on housing and transportation and by producing and preserving more affordable housing.

4. Support an expanded, well-functioning, safe and multimodal transportation system that connects the Bay Area by improving access to destinations and by ensuring residents and workers have a transportation system they can rely on.

5. Support an inclusive region where people from all backgrounds, abilities, and ages can remain in place with full access to the region's assets and resources by creating more inclusive communities and reducing the risk that Bay Area residents are displaced.

6. Conserve the region's natural resources, open space, clean water, and clean air with the intent of improving health of Bay Area residents and workers and improving the health of the environment locally and globally.

7. Support the creation of quality job opportunities for all and ample fiscal resources for communities by enabling the Bay Area economy to thrive and supporting the recovery of the region's downtowns from the pandemic.

Project Overview

Plan Bay Area 2050+ is defined by four elements: transportation, housing, the economy, and the environment. Within each, there are two or three central themes (totaling 11 across the entire plan) under which several strategies (totaling 35 across the entire plan) are nested. The guiding principles for the proposed plan are the following: affordable, connected, diverse, healthy, and vibrant. Equity and resilience are the cross-cutting issues addressed by Plan Bay Area 2050+, integrated into each element, theme, and strategy. The strategies are envisioned to be implemented through the year 2050 by local, regional, or State government, and the Implementation Plan specifies MTC's and ABAG's role in advancing each strategy through specific implementation actions over the next five years.

The proposed plan identifies needs and revenues to implement the 35 strategies. It also seeks to meet or exceed State and federal planning requirements, including State-mandated targets for GHG emissions reductions. In summary, the proposed plan:

- details transportation and select environmental strategies to invest $512 billion in expected transportation revenues from federal, State, regional, and local sources over the next 25 years (totals below may not sum due to rounding);
- details housing and economic strategies ("land use") to invest $746 billion in expected revenues to accommodate 1.8 million new residents, 1 million new households, 1.5 million new forecasted housing units, and 1.4 million new jobs between 2020 and 2050;
- details other environmental strategies to invest $229 billion in expected revenues to protect the region from 4.9 feet of inundation from both permanent sea level rise as well as temporary inundation from king tides and storms, reduce risks from other hazards such as wildfire and earthquakes, and maintain and expand the region's parks and open space system; and
- complies with SB 375, the State's SCS law, which requires integration of land use and transportation planning to reduce per-capita passenger vehicle GHG emissions by 2035 and provide adequate housing for all economic segments of the region's forecast of 1.8 million new residents and 1 million new households between 2020 and 2050.

The proposed plan is constrained by expected transportation revenues and the forecasted population and job growth discussed in Section 2.3, "Planning Assumptions." The proposed plan includes a fiscally constrained Transportation Project List outlining projects and programs eligible for future federal and State funding, but it does not allocate funds to any specific project or program. Additionally, the proposed

plan includes a list of locally developed sea level rise adaptation projects, as well as placeholder projects, collectively referred to as the Resilience Project List. The proposed plan does not change local land use policies; individual jurisdictions retain all local land use authority. The proposed plan facilitates subsequent streamlined CEQA analysis pursuant to SB 375, SB 226, SB 743, and other methods described in Section 1.9, "CEQA Streamlining Opportunities" in Chapter 1, "Introduction."

SUMMARY OF ALTERNATIVES

ALTERNATIVES

CEQA requires EIRs to evaluate a reasonable range of alternatives to the proposed project that could feasibly attain most of the basic project objectives and that would avoid or substantially lessen any of the significant environmental impacts. In addition, CEQA requires assessment of the likely foreseeable future condition if the proposed project were not implemented; this scenario is called the No Project Alternative.

This EIR evaluates the proposed plan and three alternatives, assuming the same regional forecast control totals, same 2050 horizon year, and full plan implementation. This EIR also documents the relative environmental advantages and disadvantages of the alternatives as compared to the proposed plan, and discusses the environmentally superior alternative.

The three alternatives are briefly described below. A full description of each alternative is provided in Chapter 4.

No Project Alternative

Analysis of the No Project Alternative is required under CEQA (CEQA Guidelines Section 15126.6[e]). The purpose of the No Project Alternative is to allow a comparison of the environmental impacts of approving the proposed project with the effects of not approving it. This alternative represents a future land use pattern and a more limited set of transportation and sea level rise adaptation projects consistent with local general plans and zoning that would be reasonably expected to occur if the proposed plan is not adopted.

Under the No Project Alternative, growth is assumed to occur consistent with local general plans and zoning without an adopted RTP/SCS, and assumes no new transportation or sea level rise adaptation projects beyond those currently under construction or those that have both full funding and environmental clearance ("committed"). Under the No Project Alternative, housing growth would be more dispersed, while job growth would be slightly more concentrated in San Francisco and the northern portion of the Bay Area. In comparison to the proposed plan, the No Project Alternative would result in higher household growth primarily in Contra Costa, Napa, and Santa Clara Counties, with higher job growth in San Francisco, Alameda, Contra Costa, Marin, Napa, and Sonoma Counties.

Alternative 1 – No New Highway Capacity and Transit Reinvestment Alternative

The No New Highway Capacity and Transit Reinvestment Alternative (Alternative 1) would retain the housing, economy, and environment strategies included in the proposed plan. Under this alternative, modifications are limited to the plan's transportation strategies, specifically through the removal of regionally significant roadway expansion and extension projects under Strategies T6, T7, and T8. These projects include general purpose freeway lanes, auxiliary lanes, high-occupancy vehicle (HOV) lanes, express lanes, major interchange improvements involving auxiliary lanes, and principal arterial expansions. Funding previously allocated to these roadway projects would instead be redirected to support increased transit service across all Bay Area transit operators under Strategy T11. This alternative prioritizes transit-focused investments to create a more connected and affordable Bay Area. By shifting

from highway expansion to improved transit, it enhances access to opportunity, reduces reliance on automobile travel, and lowers greenhouse gas emissions—supporting a healthy environment. While maintaining the proposed plan's land use framework, Alternative 1 positions transit as the core of regional mobility, helping to foster a more diverse and vibrant region where all residents can thrive.

Alternative 2 – Transit-Oriented Communities (TOC) Growth Focus Alternative

The TOC Growth Focus Alternative (Alternative 2) would retain all strategies in the proposed plan, including those related to transportation, housing, the economy, and the environment. However, unlike the proposed plan, which applies its housing and economy strategies across a broad range of Growth Geographies (see Chapter 2, "Project Description"), this alternative would focus application of these strategies primarily within TOC Policy Areas, thus increasing development capacity in areas close to major transit infrastructure. TOC Policy Areas are defined as the half-mile radius surrounding existing and planned fixed-guideway transit stations—including regional rail, commuter rail, light rail, bus rapid transit, and ferry terminals—based on proximity rather than local jurisdictional designation. By focusing application of housing and economy strategies within TOC Policy Areas, this alternative targets the plan's growth-supportive land use and economic development efforts within areas most directly served by major transit infrastructure. Additionally, this alternative seeks to improve the effectiveness of existing and planned transit services, reduce reliance on automobile travel, and encourage more compact, walkable, and transit-supportive communities. These changes support a connected and healthy Bay Area by lowering GHG emissions and improving access to reliable transportation, while also fostering diverse and vibrant communities where more residents can live near high-quality transit.

SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The EIR addresses impacts associated with projected growth and impacts associated with the projected land use, assumed transportation projects, and assumed sea level rise adaptation projects. Where a significant or potentially significant impact may occur, mitigation measures are provided. **Table ES-1** summarizes the impact conclusions and recommended mitigation measures identified in this EIR. The impacts are organized by environmental impact issue area in the order in which they appear in Sections 3.2 through 3.15.

Significant unavoidable impacts are those that cannot be mitigated to a less-than-significant level. Sections 3.2 through 3.15 of this EIR identify significant unavoidable impacts of the proposed plan, as summarized in **Table ES-1**. As stated in Chapter 3.1, "Approach to the Analysis," to the extent that an individual project adopts and implements all feasible mitigation measures described for each significant impact, many of the impacts listed below would be reduced to a less-than-significant level. For most impacts, MTC and ABAG do not have regulatory or approval authority over future projects. In those cases, MTC and ABAG identify specific mitigation measures for application by the lead agency. In order to rely on this EIR to streamline environmental review for an individual project, the lead agency must require the applicable mitigation measures as a part of the project-level environmental review. Therefore, many impacts have been identified as significant and unavoidable for purposes of this program-level review. Projects taking advantage of CEQA Streamlining provisions of SB 375 (Public Resources Code Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described in this EIR, as necessary and feasible to address site-specific conditions.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6(e)(2) states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives analyzed.

As discussed in Section 4.6, "Environmentally Superior Alternative," the No Project Alternative would result in two more significant and unavoidable impacts than the proposed Plan (Impacts AQ-1 and GHG-4). Because the No Project Alternative would result in more significant and unavoidable impacts than the proposed plan, it would not be the environmentally superior alternative.

Alternative 1 and Alternative 2 would result in the same number of less-than-significant and significant-and-unavoidable impacts as the proposed plan. The proposed plan, Alternative 1, and Alternative 2 would have the same reduction in per capita GHG emissions in 2035, while the no project alternative would result in no reduction. Furthermore, Alternative 1 would have the lowest daily VMT in 2050, followed by Alternative 2, the proposed plan, and no project alternative. Overall, Alternative 2 would have lower acreage of new developed land, lower acreage of development in agriculturally zoned land, lower development in toxic air contaminants (TAC) Risk Areas, and lower acreage in Bay Area Critical Linkages. Because impacts would be reduced overall under the Alternative 2, Alternative 2 is environmentally superior to the other alternatives.

AREAS OF CONTROVERSY

Section 15123 of the CEQA Guidelines requires that an EIR identify areas of controversy that are known to the Lead Agency, including issues raised by other agencies and the public. Areas of controversy associated with the proposed plan are made known through comments received during the Notice of Preparation process, as well as input solicited on the proposed plan during public scoping meetings, and an understanding of the community issues in the plan area. Areas of known controversy, related to the proposed plan and EIR include:

- Linkage between Plan Bay Area 2050+ and BCDC's Regional Shoreline Adaptation Plan (RSAP) and Subregional Shoreline Adaptation Plans (SSAPs). The RSAP and SSAP guidelines consider the impact of development on sea level rise and groundwater rise and provide a framework for shoreline communities. Stakeholders showed concern over vulnerabilities that communities near the shoreline will face. Sea level rise, including the plan's consistency with the RSAP and SSAP, is addressed throughout the proposed plan and in Chapter 3 of the EIR.
- Concerns about the existing Bay Area natural environment and habitat, including San Francisco Bay wetlands.
- Strategies and assumptions related to climate change adaptation. While sea level rise, wildfire, drought, and other impacts of climate change were addressed through specific strategies in the proposed plan or through exclusion from regional Growth Geographies, some stakeholders remain concerned that the proposed plan should reduce development in higher-risk areas for these natural hazards.
- Strategies related to climate change mitigation and sea level rise. Plan Bay Area 2050+ meets the year 2035 state greenhouse gas reduction target established by the California Air Resources Board, but some stakeholders have noted that MTC and ABAG should go further by incorporating ecological-oriented strategies in mitigation strategies.

ISSUES TO BE RESOLVED

CEQA Guidelines Section 15123(b)(3) requires that an EIR contain a discussion of issues to be resolved and whether or how to mitigate significant effects. Identified issues to be resolved include the following:

- Land use and mitigation authority. How to address potential impacts from the projected land development pattern that must be mitigated by the local jurisdiction, given that MTC and ABAG do not have land use authority.
- Plan consistency determinations. Methods to be employed by local jurisdictions for determining project consistency with Plan Bay Area 2050+ and adoption of mitigation measures by project sponsors and/or implementing agencies in a manner to enable CEQA streamlining for qualifying projects, per SB 375.
- Emission estimations. Due to the uncertainty surrounding P.L. No. 119-16 and P.L. No. 119-17, which rescinded California's ability to apply certain stricter emissions standards than required under federal law, and California's legal challenge to this federal law, MTC and ABAG must determine an appropriate modeling approach to estimate emissions from the proposed plan.
- Consideration of alternatives. In approving Plan Bay Area 2050+ MTC and ABAG must consider CEQA alternatives and make a determination regarding the most beneficial plan for the region.
- Balancing overriding considerations. In approving Plan Bay Area 2050+ MTC and ABAG must decide whether the benefits of implementing the final plan will override those environmental impacts that cannot be feasibly avoided or substantially reduced. A Statement of Overriding Considerations is required to support such a determination.

Table ES-1: Summary of Impacts and Mitigation Measures

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
3.2 Aesthetics and Visual Resources				
Impact AES-1: Have a substantial adverse effect on a scenic vista	PS	**Mitigation Measure AES-1:** Implementing agencies and/or project sponsors shall implement measures, where feasible and necessary based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Reduce the visibility of construction staging areas by fencing and screening these areas with low contrast materials consistent with the surrounding environment, and by revegetating graded slopes and exposed earth surfaces at the earliest opportunity. ◢ Site or design projects to minimize their intrusion into important viewsheds. Measures to achieve this could include, but are not limited to, requiring that the scale and massing of new development in higher-density areas provide appropriate transitions in building height and bulk that are sensitive to the physical and visual character of adjoining neighborhoods that have lower development intensities and building heights, and ensuring building heights are stepped back from sensitive adjoining uses to maintain appropriate transitions in scale and to protect scenic vistas and scenic resources. ◢ Design projects to minimize the potential to obscure, detract from, or negatively affect the quality of views from state-designated scenic roadways or scenic highways. ◢ Use see-through safety barrier designs (e.g., railings rather than walls). ◢ Develop interchanges and transit lines at the grade of the surrounding land to limit view blockage. ◢ Where highway screening is a required element of a development, design landscaping along all highways, including state-designated scenic highways, locally designated scenic highways, and highway corridors in rural and open space areas to add natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur. Retain or replace trees bordering highways so that clear-cutting is not evident. ◢ Identify, preserve, and enhance scenic vistas to and from hillside areas and other visual resources.	SU	SU

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Impact AES-2: Substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway	PS	**Mitigation Measure AES-2** Implement Mitigation Measure AES-1.	SU	SU
Impact AES-3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings and in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality	PS	**Mitigation Measure AES-3:** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Require that the scale, massing, and design of new development provide appropriate transitions in building height, bulk, and architectural style that are sensitive to the physical and visual character of surrounding areas. ◢ Contour the edges of major cut and fill slopes to provide a finished profile that is appropriate to the surrounding context, using shapes, textures, colors, and scale to minimize contrasts between the project and surrounding areas. ◢ Require project sponsors to conduct shadow studies for four-story high (and higher) buildings and roadway facilities to identify and implement development strategies for reducing the impact of shadows on public open space, where feasible. Study considerations shall include, but are not limited to, the placement, massing, and height of structures, surrounding land uses, time of day and seasonal variation, and reflectivity of materials. Study recommendations for reducing shadow impacts shall be incorporated into the project design as feasible based on project- and site-specific considerations.	SU	SU
Impact AES-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	PS	**Mitigation Measure AES-4:** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Design projects to minimize light and glare from lights, buildings, and roadways facilities. ◢ Minimize and control glare from transportation projects through the adoption of project design features that reduce glare. These features include: ▪ planting trees along transportation corridors to reduce glare from the sun; ▪ landscaping off-street parking areas, loading areas, and service areas; and ▪ shielding transportation lighting fixtures to minimize off-site light trespass. ◢ Minimize and control glare from land use and transportation projects through the adoption of project design features that reduce glare. These features include:	LTS	SU

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		▪ limiting the use of reflective materials, such as metal; ▪ using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry; ▪ screening parking areas by using vegetation or trees; and ▪ using low-reflective glass. ◢ Impose lighting standards that ensure that minimum safety and security needs are addressed and minimize light trespass and glare associated with land use development. These standards include the following: ▪ minimizing incidental spillover of light onto adjacent private properties and undeveloped open space; ▪ directing luminaries away from habitat and open space areas adjacent to the project site; ▪ installing luminaries that provide good color rendering and natural light qualities; and ▪ minimizing the potential for sky glow into the nighttime sky and for incidental spillover of light onto adjacent private properties and undeveloped open space.		
3.3 Agriculture and Forestry Resources				
Impact AGF-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use, or conflict with existing zoning for agricultural use, or a Williamson Act contract	PS	**Mitigation Measure AGF-1** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Require project relocation or corridor realignment, where feasible, to avoid agricultural land, especially Prime Farmland, Farmland of Statewide Significance, Unique Farmland, and land under a Williamson Act contract. ◢ Provide buffers, berms, setbacks, fencing, or other project design measures to protect surrounding agriculture, and to reduce conflict with farming that could result from implementation of transportation projects and/or the projected land use growth footprint included as a part of the RTP/SCS. ◢ Maintain and expand agricultural land protections such as urban growth boundaries.	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		◢ Achieve compensatory mitigation in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by the permitting agencies. ◢ Require acquisition of conservation easements on land in the same jurisdiction, if feasible, and at least equal in quality and size as mitigation for the loss of agricultural land. ◢ Institute new protection of farmland in the project area or elsewhere through the use of long-term restrictions on use, such as 20-year Farmland Security Zone contracts (Government Code Section 51296 et seq.) or 10-year Williamson Act contracts (Government Code Section 51200 et seq.).		
Impact AGF-2: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	PS	**Mitigation Measure AGF-2** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Require project relocation or corridor realignment, where feasible, to avoid land zoned for forest land or timberland. ◢ Maintain and expand forest land protections such as urban growthboundaries. ◢ Achieve compensatory mitigation in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by the permitting agencies. ◢ Require acquisition of conservation easements on land at least equal in quality and size as mitigation for the loss of forest land or timberland.	SU	SU
Impact AGF-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use	PS	**Mitigation Measure AGF-3** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Implement Mitigation Measures AGF-1 and AGF-2. ◢ Manage project operations to minimize the introduction of invasive species or weeds that may affect agricultural production on adjacent agricultural land. Where a project has the potential to introduce sensitive species or habitats or have other	SU	SU

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		spill-over effects on nearby agricultural lands, the project proponents shall be responsible for acquiring easements on nearby agricultural land and/or financially compensating for indirect effects on nearby agricultural land. Easements (e.g., flowage easements) shall be required for temporary or intermittent interruption in farming activities (e.g., because of seasonal flooding or groundwater seepage). Acquisition or compensation would be required for permanent or significant loss of economically viable operations. ◢ Design project features to minimize fragmenting or isolating agricultural land. Where a project involves acquiring land or easements, ensure that the remaining agricultural land is of a size sufficient to allow economically viable farming operations. The project sponsors shall be responsible for acquiring easements, making lot line adjustments, and merging affected land parcels into units suitable for continued commercial agricultural management.		
3.4 Air Quality				
Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan	LTS	None required.	LTS	LTS
Impact AQ-2: Result in a substantial net increase in construction-related emissions	PS	**Mitigation Measure AQ-2** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below: When applicable screening levels set by the relevant air district are exceeded, implementing agencies and/or project sponsors shall implement measures, where feasible as applicable to reduce impacts to a less-than-significant level based on project- and site-specific considerations, that include those (or equally effective measures) identified below: **Construction Best Practices for Exhaust** ◢ The applicant or general contractor for the project shall submit a list of all off-road equipment greater than 25 horsepower (hp) that would be operated for more than 20 hours over the entire duration of project construction, including equipment from subcontractors, to the relevant air district (e.g., the Bay Area Air District, NSCAPCD, or YSAQMD) for review and certification. The list shall include all information necessary to ensure the equipment meets the following requirements:	LTS-M	SU

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		▪ Equipment shall be zero emission or have engines that meet or exceed either EPA or CARB Tier 4 off-road emission standards, and it shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4 Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required. ▪ Idling time of diesel-powered construction equipment and trucks shall be limited to no more than 2 minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points. ▪ All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications. ▪ Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites, or propane and natural gas generators may be used when grid power electricity is not feasible. ▪ Current certificate(s) of compliance with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation (CCR, Title 13, Sections 2449 and 2449.1) shall be provided. **Construction Best Practices for Entrained Dust** ◢ All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. For projects over 5 acres in size, soil moisture should be maintained at a minimum of 12%. Moisture content can be verified by lab samples or a moisture probe. ◢ All haul trucks transporting soil, sand, or other loose material off-site shall be covered. ◢ All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads. ◢ All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour (mph). ◢ All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be paved as soon as possible after grading.		

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		◢ All construction sites shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints. The recommended response time for corrective action shall be within 48 hours. The Bay Area Air District's Complaint Line (1.800.334.6367) shall also be included on posted signs to ensure compliance with applicable regulations. ◢ All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. ◢ Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity. ◢ Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. ◢ The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. ◢ All trucks and equipment, including their tires, shall be washed off before leaving the site. ◢ Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel. ◢ Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1%. ◢ Hydroseed or apply nontoxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days. ◢ Minimize the amount of excavated material or waste materials stored at the site. Applicable mitigation measures shall be required at the time grading permits are issued.		
Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard	PS	**Mitigation Measure AQ-3(a)** MTC and ABAG, in partnership with the local air districts and implementing agencies, shall work together to support the use of existing air quality and transportation funds and seek additional funds to continue to implement the Bay Area Air District, NSCAPCD, YSAQMD, and CARB programs (e.g., Carl Moyer Program) intended to retrofit and replace trucks and locomotives.	SU	SU

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		Mitigation Measure AQ-3(b) MTC and ABAG, in partnership with the local air districts and the Port of Oakland, and other agency partners, shall work together to secure incentive funding to reduce mobile PM emissions from mobile exhaust and entrained PM sources, such as tire wear, brake wear, and roadway dust. **Mitigation Measure AQ-3(c)** MTC and ABAG, in partnership with local air districts, and implementing agencies shall: ◢ support the advancement of corridor-level plans and implementation of projects located on severely congested (LOS F) facilities, and ◢ incorporate transportation demand management (TDM) strategies into individual land use land transportation projects and plans, as part of the planning process; TDM strategies could include ridesharing, carsharing, telecommuting, adopting flexible working hours, implementing parking management and traffic-calming measures, and marketing TDM options (especially alternative commuting services). **Mitigation Measure AQ-3(d)** When applicable screening levels set by the applicable air district are exceeded for a specific project, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below or are updated by the applicable air district or within CalEEMod: ◢ use of energy-efficient lighting and process systems (e.g., low-NOX water heaters and boiler units); ◢ design streets to maximize pedestrian access to transit stops; ◢ include bus shelters at transit access points where deemed appropriate by local public transit operator in large residential, commercial, and industrial projects; ◢ equip residential structures with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment; ◢ provide for, or contribute to, dedication of land for off-site Class I and Class II bicycle facilities linking the project to designated bicycle commuting routes in accordance with the regional bikeway master plan; ◢ contribute to the provision of synchronized traffic signals on roadways affected by the project and as deemed necessary by the local public works department; ◢ provide transit-enhancing infrastructure that includes bus turnouts or bulbs, passenger benches, street lighting, route signs and displays, and shelters as		

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		demand and service routes warrant, subject to review and approval by local transportation planning agencies; ◢ provide pedestrian-enhancing infrastructure that includes sidewalks and pedestrian paths, direct pedestrian connections, street trees to shade sidewalks, pedestrian safety designs and infrastructure, street furniture and artwork, street lighting, pedestrian signalization and signage, and/or access between bus service and major transportation points within the project; ◢ include neighborhood park(s) or other recreational options, such as trails, within the development to minimize vehicle travel to off-site recreational and/or commercial uses; ◢ install solar water heaters; ◢ incorporate mixed uses, where permitted by local development regulations, to achieve a balance of commercial, employment, and housing options on the project site; ◢ contribute to traffic-flow improvements (e.g., right-of-way, capital improvements) that reduce traffic congestion and do not substantially increase roadway capacity; ◢ provide preferential parking spaces for carpool and vanpool vehicles, implement parking fees for single-occupancy vehicle commuters, and implement parking cash-out program for employees; ◢ use clean fuel vehicles in the vehicle fleet; ◢ require all employment centers to include an adequate number of on-site shower/locker facilities for bicycling and pedestrian commuters (typically one shower and three lockers for every 25 employees per shift); ◢ construct/contribute to bicycle and pedestrian facility improvements; ◢ provide ancillary services (e.g., cafeterias, health clubs, automatic tellers, and post offices) within walking distance of proposed development (no further than 1,500 feet) as appropriate and in compliance with local development regulations; ◢ provide park-and-ride lots as deemed feasible and appropriate by transportation planning agencies; ◢ employment centers that exceed a designated size, as measured by the number of employees, shall provide on-site child care and after-school facilities or contribute to off-site construction of such facilities within walking distance of employment land uses (for employment centers on or adjacent to industrial land uses, on-site		

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		child daycare centers shall be provided only if supported by the findings of a comprehensive HRA performed in consultation with the local air district); ◢ provide on-site pedestrian facility enhancements, such as walkways, benches, proper lighting, vending machines, and building access that are physically separated from parking lot traffic; ◢ offer alternative work schedules, where practical, that allow for work hours that are compressed into fewer than 5 days (e.g., 9/80, 4/40, or 3/36 schedules), or allow flextime schedules; ◢ provide transit amenities (e.g., on-site and off-site bus turnouts, passenger benches, or shelters) where deemed appropriate by local transportation planning agencies; ◢ contribute to the provision of synchronized traffic signals on roadways affected by the proposed project and as deemed necessary by the local public works department; ◢ provide video conferencing facilities; ◢ commit to support programs that include guaranteed ride home, subsidized transit passes, and rideshare matching; ◢ provide transportation (e.g., shuttles) to major transit stations and multimodal centers; ◢ require each employer employment center (more than 25 employees) to assign a transportation coordinator for the applicable transportation management association (TMA); ◢ require all employers to install a permanent display in employee common areas of alternate transit information, as determined by the requirements of the TMA; ◢ require employers or employment centers (more than 25 employees) to implement a guaranteed ride home program; ◢ require employers or employment centers (more than 25 employees) to implement an incentive program for riding transit, carpooling, vanpooling, biking, and walking instead of driving a single-occupancy vehicle to work, and design and locate buildings to facilitate transit access; ◢ install Energy Star (or equivalent) cool roofing systems on all buildings;		

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		◢ design shuttle and transit exits to adjoining streets to reduce time to reenter traffic from the project site; ◢ increase wall and attic insulation to 20% above Title 24 requirements (residential and commercial); ◢ orient buildings to take advantage of solar heating and natural cooling, and use passive solar designs (residential, commercial, and industrial); ◢ provide energy-efficient windows (double pane and/or Low-E) and awnings or other shading mechanisms for windows, porches, patios, and walkways; ◢ include passive solar cooling and heating features in designs, as well as ceiling and whole house fans; ◢ include programmable thermostats in the design of heating and cooling systems; and ◢ use day lighting systems, such as skylights, light shelves, and interior transom windows. See also Chapter 3, "Measures to Reduce GHG Emissions," in CAPCOA's Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (CAPCOA Handbook) for additional reduction measures (CAPCOA 2024). Although the CAPCOA Handbook focuses on GHG reduction measures, co-benefits of many measures include criteria pollutant emission reductions. Future project proponents shall use the CAPCOA Handbook to develop measures to reduce emissions to below thresholds if significant impacts are identified. **Mitigation Measure AQ-3(e)**: Implementing agencies and/or project sponsors shall implement the following measures, where feasible and as applicable to reduce impacts to a less-than-significant level based on project- and site-specific considerations, to reduce criteria air pollutant emitted by natural gas combustion in buildings: ◢ Prohibit natural gas infrastructure in new development. ◢ Use, or design to support, microgrid electric systems to facilitate the resiliency of new developments prohibiting natural gas. ◢ Equip residential structures containing front and rear yard area with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment. ◢ Install ground-source heat pumps, solar, or other alternatively-fueled water heaters instead of natural gas or grid-based electric water heaters.		

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		◢ Install ground-source heat pump, or other alternative, heating and cooling systems. ◢ Increase wall and attic insulation to 20% above Title 24 requirements (residential and commercial). ◢ Orient buildings to take advantage of solar heating and natural cooling, and use passive solar designs (residential, commercial, and industrial). ◢ Provide energy-efficient windows (double pane and/or Low-E) and awnings or other shading mechanisms for windows, porches, patios, and walkways. ◢ Use passive solar cooling and heating designs, ceiling and whole house fans, and programmable thermostats in the design of heating and cooling systems.		
Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations	PS	Implement Mitigation Measure AQ-2 **Mitigation Measure AQ-4(a)** When locating sensitive receptors in TAC risk areas, as identified in **Figure 3.4-2**, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ Install, operate and maintain in good working order a central heating, ventilation, and air conditioning (HVAC) system or other air intake system in the building, or in each individual unit, that meets or exceeds a minimum efficiency reporting value (MERV) of 13 (MERV-16 for projects located in the West Oakland Specific Plan area) or higher (BAAQMD 2016). The HVAC system shall include the following features: installation of a high-efficiency filter and/or carbon filter to filter particulates and other chemical matter from entering the building; either high-efficiency particulate air (HEPA) filters or American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) certified 85% supply filters shall be used. ◢ Reduce emissions from diesel trucks through implementing the following measures, if feasible: ▪ installing electrical hook-ups for diesel trucks at loading docks; ▪ requiring trucks to use transportation refrigeration units that meet Tier 4 emission standards; ▪ requiring truck-intensive projects to use advanced exhaust technology (e.g., hybrid) or alternative fuels; ▪ prohibiting trucks from idling for more than 2 minutes;	SU	SU

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		▪ establishing truck routes to avoid sensitive receptors in the project; and ▪ implementing a truck route program, along with truck calming, parking, and delivery restrictions. ◢ Install passive electrostatic filtering systems with low air velocities (i.e., less than 1 mph). ◢ Phase residential developments when proposed within 500 feet of freeways such that homes nearest the freeway are built last, if feasible. ◢ Locate sensitive receptors as far away from truck activity areas, such as loading docks and delivery areas, as feasible. ◢ Ensure that existing and new standby or emergency diesel generators meet CARB's Tier 4 emission standards, if feasible. ◢ Locate individual and common exterior open space and outdoor activity areas proposed as part of individual projects as far away as possible from emission source within the project site boundary, face them away major freeways, and shield them from the source (i.e., the roadway) of air pollution with buildings or otherwise buffer them to further reduce air pollution for project occupants. ◢ Locate air intakes and design windows to reduce PM exposure (e.g., windows nearest to the roadway do not open). ◢ If sensitive receptors are located near a distribution center, do not locate residents immediately adjacent to a loading dock or where trucks concentrate to deliver goods. ◢ Locate sensitive receptors in buildings in areas upwind of major roadway traffic to reduce exposure to reduce cancer risk levels and exposure to $PM_{2.5}$. ◢ Plant trees and/or vegetation between sensitive receptors and pollution source. Trees that are best suited to trapping PM shall be planted, including one or more of the following species: pine (Pinus nigra var. maritima), cypress (x Cupressocyparis leylandii), hybrid popular (Populus deltoids x trichocarpa), California pepper tree (Schinus molle), and redwood (Sequoia sempervirens). ◢ Reduce emissions from diesel trucks by establishing truck routes to avoid residential neighborhoods or other land uses serving sensitive populations, such as hospitals, schools, and child care centers. A truck route program, along with truck calming, parking and delivery restrictions, shall be implemented to direct traffic activity at non-permitted sources and large construction projects.		

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		These measures are consistent with recommendations in the Bay Area Air District's CEQA Guidelines (BAAQMD 2023a) and Planning Healthy Places (BAAQMD 2016). **Mitigation Measure AQ-4(b)** MTC and ABAG shall partner with the Bay Area Air District and local lead agencies to develop a program to install air filtration devices in existing residential buildings, and other buildings with sensitive receptors, located near freeways or sources of TACs and $PM_{2.5}$. **Mitigation Measure AQ-4(c)** MTC and ABAG shall partner with the Bay Area Air District to develop a program to provide incentives to replace older locomotives and trucks in the region to reduce TACs and $PM_{2.5}$. **Mitigation Measure AQ-4(d)** The implementing agency shall implement the strategies identified in the CARB Technical Advisory to reduce air pollution exposure near high-volume roadways to less-than-significant levels, where feasible. Examples of effective strategies include (CARB 2017): ◢ using speed reduction mechanisms, such as roundabouts to reduce the frequency of stop-and-go driving common among streets that support stop signs; ◢ using traffic signal management to limit the frequency of stop-and-go driving and vehicle idling; ◢ establishing and enforcing speed limit reductions of high-speed roadways; ◢ using design elements that promote air flow and pollutant dispersion along street corridors to optimize air flow, building downwash, and pollution dispersal; ◢ incorporating bike lanes and sidewalks to promote alternative, zero-pollution modes of transportation; and ◢ constructing solid barriers directly adjacent to high-volume roadways, such as sound walls to improve downwash.		
Impact AQ-5: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	LTS	None required.	LTS	LTS
3.5 Biological Resources				
Impact BIO-1a: Have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special status in	PS	**Mitigation Measure BIO-1(a)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):	LTS-M	SU

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local or regional plans, policies, or regulations, or by CDFW, USFWS, or NOAA Fisheries		◢ Implementing agencies shall require project sponsors to prepare biological resource assessments for specific projects proposed in areas known or likely to contain habitat suitable for special-status plants and wildlife, such as sites that are not surrounded by urban development and/or have not been previously disturbed or developed. The assessment shall be conducted by qualified professionals pursuant to adopted protocols and agency guidelines, where applicable. Where the biological resource assessments establish that mitigation is required to avoid and minimize direct and indirect adverse effects on special-status plant and wildlife species, or compensate for unavoidable effects, mitigation shall be developed consistent with the requirements or standards of CEQA, USFWS, CDFW, and local regulations and guidelines, in addition to requirements of any applicable and adopted HCP/NCCP or other applicable plans developed to protect species or habitat. ◢ For proposed plan projects subject to CEQA or NEPA, or subject to permitting processes and review by CDFW, USFWS, and NOAA Fisheries, pre-project biological surveys shall be conducted as part of the CEQA/NEPA process to determine the presence and extent of sensitive habitats and species in the project vicinity. Surveys shall follow established methods and shall be conducted at times when the subject species is most likely to be identified. In cases where impacts on State- or federally listed plant or wildlife species are possible, formal protocol-level surveys may be required on a species-by-species basis to determine the local presence and distribution of these species. Coordination with CDFW, USFWS, and NOAA Fisheries, as appropriate, shall be conducted early in the planning process at an informal level for projects that could adversely affect federal or State candidate, proposed, threatened, or endangered species to determine the need for consultation or permitting actions. Projects shall obtain incidental take authorization from the permitting agencies, as required, before project implementation. ◢ A species and habitat compensation plan shall be prepared and implemented for unavoidable direct impacts on special-status plant species and shall be reviewed and approved by the resource agencies and lead agency prior to project approval. The plan shall identify effective methods for reestablishing the affected species and habitat, including but not limited to seed collection, salvage of root masses, and planting seeds and/or root masses in an area with suitable conditions. The plan shall also specify a monitoring program designed to evaluate success in reestablishing the affected species and habitat, and remedial measures that shall be followed if the project is not		

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		meeting specified performance criteria. The monitoring program shall be designed and implemented to evaluate the current and probable future health of the resources, and their ability to sustain populations in keeping with natural populations following the completion of the program. Remedial measures are highly dependent upon the species and habitats in question, but generally shall include but not be limited to invasive species management, predator control, access control, replanting and reseeding of appropriate habitat elements, regarding, and propagation and seed bulking programs. ◢ Project designs shall be reconfigured, whenever practicable, to avoid special-status species and sensitive habitats. Projects shall minimize ground disturbances and transportation project footprints near sensitive areas to the extent practicable. ◢ Temporary access roads and staging areas shall not be located within the areas containing sensitive plants or wildlife species wherever feasible, to avoid or minimize impacts on these species. ◢ Project activities in the vicinity of sensitive resources shall be completed during the period that best avoids disturbance to plant and wildlife species present to the extent feasible. ◢ Individual projects shall minimize the use of in-water construction methods in areas that support sensitive aquatic species, especially when listed species could be present. ◢ If equipment needs to operate in any watercourse with flowing or standing water where special-status species may be affected, a qualified biological resource monitor shall be present to alert construction crews to the possible presence of such special-status species. ◢ If project activities involve pile driving or vibratory hammering in or near water, interim hydroacoustic threshold criteria for protected fish species shall be adopted as set forth by the Interagency Fisheries Hydroacoustic Working Group, as well as other avoidance methods to reduce the adverse effects of construction to sensitive fish, piscivorous birds, and marine mammal species. ◢ A qualified biologist shall locate and fence off sensitive resources before construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction. ◢ For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews		

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		and contractors (primarily crew and construction foremen) before construction activities begin. ◢ Biological monitoring shall be considered for areas near identified habitat for State- and federally listed species, and a "no take" approach shall be taken whenever feasible during construction near special-status plant and wildlife species. ◢ Mitigation Measure NOISE-1 shall be implemented when permanent or temporary noise has been identified as having a potential impact on wildlife. ◢ Impacts resulting from nighttime lighting associated with construction and future permanent lighting shall be assessed at the project level. This assessment shall include an analysis of current light sources in the vicinity of the project. All feasible measures to reduce impacts from nighttime lighting shall be considered and implemented at the project level based on site-specific conditions. They may include but shall not be limited to the following measures: ▪ To the extent feasible, nighttime lighting sources shall not be installed in areas that contain or are likely to contain habitat suitable for special-status species. ▪ Nighttime lighting shall be directed at the construction or project site and away from sensitive habitats. Light glare shields shall be used to reduce the extent of illumination onto adjoining areas. Permanent lighting shall be shielded and directed at intended use areas. ▪ LEDs or bulbs installed as part of a project shall be rated to emit or produce light at or under 2700 Kelvin, which results in the output of a warm white color spectrum. ▪ Physical barriers, including solid concrete barriers or privacy slats in cyclone fencing, shall be installed where they have the potential to reduce illumination from overhead lights and automobile lights. Barriers should only be utilized as a light pollution minimization measure if they do not create a substantial barrier to wildlife movement such that the height and/or width of the barrier do not allow wildfire to move through the area. Additional barrier types should be employed when feasible, such as privacy slats into the spacing of cyclone fencing to create light barriers for areas outside the roadway. ▪ Reflective highway markers shall be used to reduce raptor collisions on roadways.		

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		▪ Projects on previously unlit roadways with adjacent sensitive habitat and open space shall explore design options that address safety needs without the use of artificial lighting. ▪ If nighttime lighting has the potential to result in adverse effects on a listed or candidate wildlife species (e.g., a nest, den, or other important habitat feature is identified near the project site), then consultation with the appropriate natural resource agency may be required. ◢ Fencing and/or walls shall be built to avoid temporary or permanent access of humans or domestic animals from development areas into areas occupied by special-status species. Spoils, trash, or any debris shall be removed offsite to an approved disposal facility. ◢ Project activities shall comply with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures protective of special-status species. ◢ Compensatory mitigation for unavoidable loss of habitat or other impacts on special-status species may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning (RAMP) (i.e., Conservation and Mitigation Banking, natural community conservation planning, Regional Conservation Investment Strategies), as deemed appropriate by the permitting agencies. Projects will prioritize mitigation banking within the same county as the project, if possible (i.e., if mitigation banks or mitigation credits are available in a given county).		
Impact BIO-1b: Have substantial adverse impacts on designated critical habitat for federally listed plant and wildlife species	PS	**Mitigation Measure BIO-1(b)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, for projects that could affect designated critical habitat for federally listed plant and wildlife species that include those identified below (or other equally effective measures): ◢ Coordination with USFWS and NOAA Fisheries, as appropriate based on the species, shall be conducted early in the environmental review process to determine the need for further mitigation, consultation, or permitting actions. Formal consultation is required for any project with a federal nexus when a listed species or designated critical habitat is likely to be adversely affected. Any	LTS-M	LTS-M

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		conservation measures required by USFWS or NOAA Fisheries as part of formal consultation (e.g., through issuance of a biological opinion) would be implemented. ◢ Reconfigure project design to avoid or minimize adverse effects on protected species within designated critical habitats. ◢ Implementing agencies and/or project sponsors shall comply with existing local regulations and policies, including applicable HCP/NCCPs. ◢ Additionally, implementation of Mitigation Measure BIO-1(a), above, includes an initial biological resource assessment and, if necessary, compensatory mitigation for unavoidable loss of habitat or other impacts on special-status species. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies.		
Impact BIO-2: Have a substantial adverse effect on riparian habitat, State- or federally protected wetlands (including but not limited to marsh, vernal pool, coastal), or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by CDFW or USFWS, through direct removal, filling, hydrological interruption, or other means	PS	**Mitigation Measure BIO-2** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Implementing agencies shall require project sponsors to prepare biological resource assessments for specific projects proposed in areas containing, or likely to contain, jurisdictional waters or other sensitive or special-status communities. These assessments shall be conducted by qualified professionals in accordance with agency guidelines and standards. Qualified professionals shall reference applicable regional data sources for wetland mapping, which may include, but not be limited to, the Adaptation Atlas (San Francisco Estuary Institute 2021), Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013), and the 2015 Bay Ecosystem Habitat Goals Update (Goals Project 2015). Where the biological resource assessments establish that mitigation is required to avoid and minimize direct and indirect adverse effects on State- or federally protected wetlands, or compensate for unavoidable effects, mitigation shall be developed consistent with the requirements or standards of USACE, EPA, RWQCB, and CDFW, and local regulations and guidelines, in addition to requirements of any applicable and adopted HCP/NCCP or other applicable plans developed to protect these resources. In keeping with the "no net loss" policy for jurisdictional waters (i.e., wetlands and other waters of the United States or State), project designs shall be configured, whenever possible, to avoid wetlands and other waters and avoid disturbances to wetlands and	LTS-M	LTS-M

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		riparian corridors to preserve both the habitat and the overall ecological functions of these areas. Projects shall minimize ground disturbances and transportation project footprints near such areas to the extent practicable. ▪ Project sponsors shall consult with USFWS, NMFS, USFS, CDFW where State-designated sensitive or riparian habitats provide potential or occupied habitat for federally listed rare, threatened, and endangered species afforded protection pursuant to the ESA, the MBTA during the breeding season, CESA, or fully protected species afforded protection pursuant to the State Fish and Game Code and with the CDFW pursuant to the provisions of Section 1600 of the State Fish and Game Code as they relate to Lakes and Streambeds. ◢ Where avoidance of jurisdictional waters is not feasible, project sponsors shall minimize fill and the use of in-water construction methods, and place fill only with express permit approval from the appropriate resource agencies (e.g., USACE, RWQCB, CDFW, BCDC, CCC) and in accordance with applicable existing regulations, such as the Clean Water Act or local stream protection ordinances. ◢ Where avoidance of jurisdictional waters is not feasible, project sponsors shall arrange for compensatory mitigation in the form of mitigation bank credits; on-site or off-site enhancement of existing waters; or wetland creation in accordance with applicable existing regulations and subject to approval by USACE, RWQCB, CDFW, BCDC, and/or CCC. If compensatory mitigation is required, the project sponsor shall develop a restoration and monitoring plan that describes how compensatory mitigation will be achieved, implemented, maintained, and monitored. At a minimum, the restoration and monitoring plan shall include clear goals and objectives, success criteria, specifics on restoration/creation/enhancement (e.g., plant palette, soils, irrigation design standards and requirements), specific monitoring periods and reporting guidelines, and a maintenance plan. The following minimum performance standards (or other standards as required by the permitting agencies) shall apply to any wetland compensatory mitigation: ▪ Compensation shall be provided at a minimum 1:1 ratio for restoration, preservation, and creation but shall in all cases be consistent with mitigation ratios set forth in locally applicable plans (e.g., general plans, HCP/NCCPs) or in project-specific permitting documentation. Compensatory mitigation may be a combination of on-site restoration/creation/enhancement or off-site		

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		restoration, preservation, or enhancement. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies. ▪ In general, any compensatory mitigation shall be monitored for a minimum of 5 years and will be considered successful when at least 75% cover (or other percent cover considered appropriate for the vegetation type) of installed vegetation has become successfully established. ▪ If the restoration is not meeting success criteria, remedial measures shall be implemented and can include, but are not limited to, replanting, reseeding, grading adjustments, supplemental irrigation, access control, increased weed control, and extended maintenance and monitoring periods. After final success criteria have been met and relevant permitting agencies have approved the mitigation project as complete, all mitigation areas shall be permanently conserved (e.g., conservation easement) and managed in perpetuity. ◢ Salvage and stockpile topsoil (i.e., the surface material from 6 to 12 inches deep) and perennial native plants, when recommended by the qualified wetland biologist, for use in restoring native vegetation to areas of temporary disturbance within the project area. Salvage of soils containing invasive species, seeds and/or rhizomes shall be avoided as identified by the qualified wetland biologist. ◢ In accordance with CDFW guidelines and other instruments protective of sensitive or special- status natural communities, project sponsors shall avoid and minimize impacts on sensitive natural communities and habitats when designing and permitting projects. Where applicable, projects shall conform to the provisions of special area management or restoration plans, such as the Suisun Marsh Protection Plan and the East Contra Costa County HCP, which outline specific measures to protect sensitive vegetation communities. Where applicable, project sponsors shall consult standards established in the Regional Shoreline Adaptation Plan guidelines to avoid impacts on shoreline habitats. ◢ If any portion of a sensitive natural community is permanently removed or temporarily disturbed, the project sponsor shall provide compensatory mitigation for the loss. If such mitigation is required by the implementing agency, the project sponsor shall develop a restoration and monitoring plan that describes how		

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		compensatory mitigation will be achieved, implemented, maintained, and monitored. At a minimum, the restoration and monitoring plan shall include clear goals and objectives, success criteria, specifics on restoration/creation/enhancement (e.g., plant palette, soils, irrigation design standards and requirements), specific monitoring periods and reporting guidelines, and a maintenance plan. The following minimum performance standards (or other standards as required by the permitting agencies) shall apply to any compensatory mitigation for sensitive natural communities: ▪ Compensation shall be provided at a minimum 1:1 ratio for restoration and preservation but shall in all cases be consistent with mitigation ratios set forth in locally applicable plans (e.g., general plans, HCP/NCCPs) or in project-specific permitting documentation. Compensatory mitigation may be a combination of on-site restoration/creation/enhancement or off-site restoration, preservation, or enhancement. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies. ▪ In general, any compensatory mitigation shall be monitored for a minimum of 5 years and will be considered successful when at least 75% cover (or other percent cover considered appropriate for the vegetation type) of installed vegetation has become successfully established. ▪ If the restoration is not meeting success criteria, remedial measures shall be implemented and may include, but are not limited to, replanting, reseeding, grading adjustments, supplemental irrigation, access control, increased weed control, and extended maintenance and monitoring periods. After final success criteria have been met and relevant permitting agencies have approved the mitigation project as complete, all mitigation areas shall be permanently conserved (e.g., conservation easement) and managed in perpetuity. ◢ All construction materials, staging, storage, dispensing, fueling, and maintenance activities shall be located in upland areas outside of sensitive habitat, and adequate measures shall be taken to prevent any potential runoff from entering jurisdictional waters. Fueling of equipment shall take place within existing paved roads. Contractor equipment shall be checked for leaks prior to operation and repaired, as necessary.		

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		◢ Construction activities shall be scheduled, to the extent feasible, to avoid sensitive times for biological resources and to avoid the rainy season when erosion and sediment transport is increased. ◢ Compliance with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures protective of wetlands and other waters or sensitive natural communities.		
Impact BIO-3: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites	PS	**Mitigation Measure BIO-3(a)** Implementing agencies shall require project sponsors to prepare detailed analyses for specific projects affecting mapped critical linkages to determine the wildlife species that may use these areas and the habitats those species require. Projects that would not affect mapped critical linkages but that are located within or adjacent to open space lands, including wildlands and agricultural lands, or otherwise may contain land used as wildlife movement corridors (e.g., green belts in urban areas) shall also assess whether significant wildlife corridors are present, what wildlife species may use them, and what habitat those species require. The assessment shall be conducted by qualified professionals and according to applicable agency standards with consideration of the local, regional, and global context of landscape connectivity for a given project in a given area. Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Design projects to minimize impacts on wildlife movement and habitat connectivity and preserve existing and functional wildlife corridors. ◢ Design projects to promote wildlife corridor redundancy by including multiple connections between habitat patches. ◢ Consult relevant guidance documents regarding wildlife movement and habitat connectivity during the project design phase, including but not limited to statewide and Bay Area region guides (e.g., CLN mapping, CDFW's California Wildlife Barriers 2020 [CDFW 2020], the California Department of Transportation's Wildlife Crossings Guidance Manual [Meese et al. 2007], Critical Linkages: Bay Area & Beyond [Penrod et al. 2013]), and local guides (e.g., Gray et al. 2018; Diamond and Snyder 2016). ◢ Conduct wildlife movement studies for projects that may fragment or constrict regional or local corridors and impede use to nursery sites. These studies will include, but would not be limited to, the following objectives: identify activity levels	LTS-M	SU

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		and directional wildlife movement trends within the study area, consult the California Fish Passage Assessment Database (CALFISH database) to identify potential fish barrier locations and conduct first pass and second pass fish assessments as necessary, assess current functionality of existing underpasses, and determine what species or groups of species exhibit sensitivity to the existing roadways. Movement studies shall identify project-specific measures to avoid or mitigate impacts on corridors and movement to nursery sites that may include, but are not limited to, developing alternative project designs that allow wider movement corridors to remain; provide for buffer zones adjacent to corridors, such as passive recreation zones; implement physical barriers that prevent human and/or domestic predator entry into the corridor or block noise and lighting from development; incorporate shielded and directed lighting in areas near corridors; implement a "natives only" landscaping policy within 200 feet of identified wildlife corridors; incorporate periodic larger habitat patches along a corridor's length; minimize the number of road crossings of identified wildlife corridors; and replace roadway culverts with bridges to allow for wildlife movement. ◢ For projects that cannot avoid significant impacts on wildlife movement corridors or native wildlife nursery areas, consult with CDFW to determine appropriate measures to minimize direct and indirect impacts and implement measures to mitigate impacts on wildlife corridors or native wildlife nursery sites. ◢ Conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on- and off-site. Preservation or improvements of habitat on both sides of a wildlife crossing shall be prioritized. ◢ Analyze habitat linkages and wildlife movement corridors on a broad scale for long linear projects with the possibility of adversely affecting wildlife movement to avoid critical narrow choke points that could reduce function of recognized movement corridor. ◢ Construct wildlife-friendly overpasses and culverts. These structures shall be designed to meet the needs of appropriate species, considering factors such as the size or diameter of the structure (e.g., large enough to allow a target species to pass through/over or to allow sufficient stream flow), interval frequency, and/or physical design to allow conditions similar to the surrounding habitat (e.g., open-bottom culverts that provide natural substrate on the stream bottom).		

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		◢ Upgrade existing culverts or implement directional fencing to guide animals to existing culverts or underpasses when conducting expansion or enhancement projects on existing roads. ◢ Fence major transportation corridors in the vicinity of identified wildlife corridors. ◢ Use wildlife-friendly fences that allow larger wildlife, such as deer, to jump over (i.e., no greater than 4 to 5 feet tall on average) and smaller wildlife to move under (by leaving a gap under the fence). ◢ For projects that require the placement of stream culverts in a fish spawning stream, follow USACE, NOAA Fisheries, USFWS, and CDFW permit conditions and design requirements to allow fish passage through the culverts. ◢ Limit wildland conversions in identified wildlife corridors such that the function of the wildlife corridor is not impaired. ◢ Retain wildlife-friendly vegetation in and around developments (e.g., native plant species; vegetation that provides sufficient cover, nesting, or foraging opportunities; mature trees; riparian vegetation). ◢ Monitor and maintain fencing, under crossings, and/or other crossing structures as needed to ensure corridor permeability and functionality. Development and implementation of a fencing and wildlife crossing structure maintenance plan is recommended to maintain permeability for wildlife across corridors. ◢ Prohibit construction activities within 500 feet of occupied breeding areas for wildlife afforded protection pursuant to Title 14 Section 460 of the CCR (protecting fur-bearing mammals), during the breeding season. ◢ Comply with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures to protect wildlife corridors. **Mitigation Measure BIO-3(b)** Implementing agencies and/or project sponsors shall implement the following measures, where and as applicable based on project- and site-specific considerations: ◢ Implement Mitigation Measures BIO-1(a) and BIO-2.		

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Impact BIO-4: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or with provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan (NCCP); or other approved local, regional, or State HCP	LTS	None required.	LTS	LTS
Impact BIO-5: Have the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species	PS	**Mitigation Measure BIO-5** Implementing agencies and/or project sponsors shall implement the following measures (or other equally effective measures), where feasible and as applicable based on project- and site-specific considerations: ◢ Implement Mitigation Measures BIO-1(a), BIO-1(b), BIO-2, and BIO-3(a).	LTS-M	SU
3.6 Climate Change, Greenhouse Gases, and Energy				
Impact GHG-1: Result in a net increase in greenhouse gas emissions, either directly or indirectly, compared to 2015 conditions that may have a significant impact on the environment	PS	**Mitigation Measure GHG-1** The applicable lead agency can and should implement, where feasible and as applicable to address site-specific construction climate change impacts, the following measures (or equally effective measures) to avoid or minimize impacts related to construction GHG emissions: ◢ Project proponents shall require its contractors to restrict the idling of on- and off-road diesel equipment to no more than 5 minutes while the equipment is on-site. ◢ Project proponents of new facilities shall implement waste, disposal, and recycling strategies (i.e., 10% recycled content for Tier 1 and 15% recycled content for Tier 2) in accordance with the voluntary measures for nonresidential land uses contained in Section A5.405 of the 2022 CALGreen Code or in accordance with any update to these requirements in future iterations of the CALGreen Code in place at the time of project construction. ◢ Project proponents of new facilities shall achieve or exceed the enhanced Tier 2 target for nonresidential land uses of recycling or reusing 80% of the construction waste as described in Section A5.408 of the 2022 CALGreen Code or in accordance with any update to these requirements in future iterations of the CALGreen Code in place at the time of project construction. ◢ Project proponents shall require all diesel-powered, off-road construction equipment meet EPA's Tier 3 or Tier 4 emissions standards as defined in 40 CFR	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		1039 and comply with the exhaust emission test procedures and provisions of 40 CFR Parts 1065 and 1068. This measure can also be achieved by using battery-electric off-road equipment as it becomes available. ◢ Project proponents shall implement a program that incentivizes construction workers to carpool and use public transit or EVs to commute to and from the project site.		
Impact GHG-2: Conflict with the Bay Area region's achievement of the GHG emissions reduction target of 19% below 2005 emissions by 2035 established by CARB pursuant to SB 375	LTS	None required.	LTS	LTS
Impact GHG-3: Conflict with an applicable State plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	PS	ABAG and MTC do not have authority to require the implementing agencies to adopt the identified mitigation measures but instead shall serve in a supportive role to assist implementing agencies in applying these measures. However, implementation of the following measures or other comparable measures identified by the lead agency at a project-level would reduce impacts related conflict with GHG emissions targets and agencies with jurisdiction to adopt these measures can and should do so (PRC Section 21081). **Mitigation Measure GHG-3** ABAG and MTC, in partnership with air districts in the plan area, shall work with the counties and cities in the plan area to adopt qualified GHG reduction plans (e.g., CAPs), develop GHG-reducing planning policies, and implement local climate initiatives, with the ultimate completion date to be achieved by the proposed plan's horizon year. These reductions can be achieved through a combination of programs, including zero net energy in new construction, retrofits of existing buildings, incentivizing the development of renewable energy sources that serve both new and existing land uses, and other measures. Notably, the development and implementation of GHG reduction plans would ultimately occur at the discretion of local agencies, counties, and municipalities. Nevertheless, ABAG and MTC shall contribute relevant data and protocols to assist in the development of inventories, forecasts, and GHG reduction strategies. Implement Mitigation Measures AQ-3(a) through AQ-3(d), TRA-2(a), and TRA-2(b)	SU	SU
Impact GHG-4: Conflict with an applicable local plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	LTS	None required.	LTS	LTS

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Impact EN-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation	LTS	None required.	LTS	LTS
Impact EN-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LTS	None required.	LTS	LTS
3.7 Cultural Resources and Tribal Cultural Resources				
Impact CUL/TCR-1: Cause a substantial adverse change in the significance of a built environment historical resource as defined in Guidelines Section 15064.5	PS	**Mitigation Measure CUL/TCR-1** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ Require a survey and evaluation of buildings and structures greater than 50 years in age within the area of potential effect to determine their eligibility for recognition under federal, State, and/or local historic preservationcriteria. The evaluation shall be prepared by an architectural historian or historical architect meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation-Professional Qualification Standards (SOI PQS). The evaluation shall comply with CEQA Guidelines Section 15064.5(b) and, if federal funding or permits are required, with Section 106 of the National Historic Preservation Act of 1966 (16 US Code Section 470 et seq.). Study recommendations shall be implemented. ◢ Realign or redesign projects to avoid impacts on known historical resources where possible. ◢ If avoidance of impacts to a significant historical resource is not feasible, implement additional mitigation options that include specific design plans for historic districts or plans for alteration or adaptive reuse of a historical resource that follows the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*. The application of the standards shall be overseen by an architectural historian or historic architect meeting the SOI PQS. Prior to any construction activities that may affect the historical resource, a report meeting industry standards shall identify and specify the treatment of character-defining features and construction activities and be provided to the lead agency for review and approval.	SU	SU

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		◢ If a project would result in the demolition or significant alteration of a historical resource, the resource shall be recorded prior to demolition or alteration. Recordation shall take the form of Historic American Buildings Survey (HABS), Historic American Engineering Record (HAER), or Historic American Landscape Survey (HALS) documentation and shall be performed by an architectural historian or historian who meets the SOI PQS. The documentation package shall be archived in appropriate public and secure repositories. The specific scope and details of documentation shall be developed at the project level in coordination with the lead agency. ◢ Comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect historical resources.		
Impact CUL/TCR-2: Cause a substantial adverse change in the significance of a unique archaeological resource as defined in Guidelines Section 15064.5	PS	**Mitigation Measure CUL/TCR-2** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below: ◢ Before construction activities, project sponsors shall retain a qualified archaeologist to conduct a record search at the appropriate information center to determine whether the project area has been previously surveyed and whether resources were identified; the record search shall include contacting the NAHC to request a Sacred Lands File search and a list of relevant Native American contacts who may have additional information. If a survey of the project area has not been conducted in the last 5 years, project sponsors shall retain a qualified archaeologist to conduct archaeological surveys prior to construction activities. Project sponsors shall follow recommendations identified in the survey, which may include activities such as subsurface testing, designing and implementing a Worker Environmental Awareness Program, construction monitoring by a qualified archaeologist, avoidance of sites, or preservation in place. ◢ Areas determined to be of cultural significance shall be monitored during the grading, excavation, trenching, and removal of existing features by a qualified archeologist and culturally affiliated California Native American tribal monitor. ◢ To ensure that new transportation facilities do not adversely affect potentially buried archaeological deposits, an underwater archaeological survey shall be conducted to identify, evaluate, and protect significant submerged cultural resources prior to activities that would disturb the shoreline or the floor of the bay.	SU	SU

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		Additionally, the archaeologist shall request a search of California State Lands Commission's Shipwreck Database. ◢ When a project would impact a known archaeological site, the project sponsor and/or implementing agency shall determine whether the site is a historical resource (CEQA Guidelines Section 15064.5[c][1]). If archaeological resources identified in the project area are considered potentially significant, the project sponsor and/or responsible implementing agency shall undertake additional studies overseen by a qualified archaeologist (36 CFR Section 61) to evaluate the resources eligibility for listing in the CRHR, NRHP, and/or local register and to recommend further mitigative treatment. Evaluations shall be based on, but not limited to, surface remains, subsurface testing, or archival and ethnographic resources, on the framework of the historic context and important research questions of the project area, and on the integrity of the resource. If a site to be tested is precontact, culturally affiliated California Native American tribal representatives shall be afforded the opportunity to monitor the ground-disturbing activities. Appropriate mitigation may include curation of artifacts removed during subsurface testing. ◢ If precontact archeological resources are identified through survey or discovered in the project area, the culturally affiliated California Native American tribe shall be notified. Both the archeologist and tribal monitor or tribal representative should strive for agreement on the determined significance of an artifact or cultural resource. ◢ If significant archaeological resources that meet the definition of historical or unique archaeological resources are identified in the project area, the preferred mitigation of impacts is preservation in place (CEQA Guidelines Section 15126.4[b]; PRC Section 21083.2). Preservation in place may be accomplished by, but is not limited to, avoidance by project design, incorporation within parks, open space or conservation easements, covering with a layer of sterile soil, or similar measures. If preservation in place is feasible, mitigation is complete. Additionally, where the implementing agency determines that an alternative mitigation method is superior to in-place preservation, the project sponsor and/or implementing agency may implement such alternative measures. ◢ When preservation in place or avoidance of historical or unique archaeological resources are infeasible, data recovery through excavation shall be required (CEQA Guidelines Section 15126.4[b]). Data recovery would consist of approval of a Data		

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		Recovery Plan and archaeological excavation of an adequate sample of site contents so that research questions applicable to the site can be addressed. For precontact sites, the culturally affiliated California Native American tribe shall be afforded the opportunity to monitor the ground-disturbing activities. If only part of a site would be impacted by a project, data recovery shall only be necessary for that portion of the site. Data recovery shall not be required if the implementing agency determines prior testing and studies have adequately recovered the scientifically consequential information from the resources. Confidential studies and reports resulting from the data recovery shall be deposited with the Northwest Information Center. Mitigation may include curation for artifacts removed during data recovery excavation. ◢ If archaeological resources are discovered during construction, all work near the find shall be halted and the project sponsor and/or implementing agency shall follow the steps described under CEQA Guidelines Section 15064.5(f), including an immediate evaluation of the find by a qualified archaeologist (36 CFR Section 61) and implementation of avoidance measures or appropriate mitigation if the find is determined to be a historical resource or unique archaeological resource. If the find is a precontact archaeological site, the culturally affiliated California Native American tribe shall be notified and afforded the opportunity to monitor mitigative treatment. During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project area. ◢ Integrate curation of all historical resources or an archaeological nature or unique archaeological resources and associated records in a regional center focused on the care, management, and use of archaeological collections. All Native American human remains and associated grave goods discovered shall be returned to their Most Likely Descendent and repatriated. The final disposition of artifacts not directly associated with Native American graves will be negotiated during consultation with the culturally affiliated California Native American tribes. Artifacts include material recovered from all phases of work, including the initial survey, testing, indexing, data recovery, and monitoring. Curated materials shall be maintained with respect for cultures and available to future generations for research. ◢ Project sponsors shall comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect archaeological resources.		

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Impact CUL/TCR-3: Disturb any human remains, including those interred outside of formal cemeteries	LTS	None required.	LTS	LTS
Impact CUL/TCR-4: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe	PS	**Mitigation Measure CUL/TCR-4(a)** If the implementing agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process required under PRC Section 21080.3.2, implementing agencies and/or project sponsors shall implement the following measures (or equally effective measures), where feasible and as applicable, to address site-specific impacts and avoid or minimize the significant adverse impacts: ◢ Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource (PRC Section 21084.3[a]). If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process, provisions in the PRC describe mitigation measures that, if determined by the lead agency to be feasible, may avoid or minimize the significant adverse impacts (PRC Section 21084.3[b]). Examples include: ▪ avoiding and preserving the resources in place, including planning and constructing to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space to incorporate the resources with culturally appropriate protection and management criteria; ▪ treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including: • protecting the cultural character and integrity of the resource, • protecting the traditional use of the resource, and • protecting the confidentiality of the resource; ▪ establishing permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places; and ▪ protecting the resource. ◢ The implementing agency shall determine whether or not implementation of a project would indirectly affect tribal cultural resources by increasing public visibility and ease of access. If it would, the implementing agency shall take measures to reduce the visibility or accessibility of the tribal cultural resource to	SU	SU

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		the public. Visibility of the resource can be reduced through the use of decorative walls or vegetation screening. Accessibility can be reduced by installing fencing or vegetation barriers, particularly noxious vegetation, such as poison oak or blackberry bushes. It is important to avoid creating an attractive nuisance when protecting tribal cultural resources. Conspicuous walls or signs indicating that an area is restricted may result in more attempts to access the excluded area. **Mitigation Measure CUL/TCR-4(b)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable a based on project- and site-specific considerations, that include those identified below: ◢ Implement Mitigation Measure CUL/TCR-2.		
3.8 Geology, Seismicity and Mineral Resources				
Impact GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault	LTS	None required	LTS	LTS
Impact GEO-2: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking	LTS	None required	LTS	LTS
Impact GEO-3: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction, lateral spreading, and subsidence	LTS	None required	LTS	LTS
Impact GEO-4: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides	LTS	None required	LTS	LTS
Impact GEO-5: Result in substantial soil erosion or the loss of topsoil	LTS	None required	LTS	LTS

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Impact GEO-6: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property	LTS	None required	LTS	LTS
Impact GEO-7: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	PS	**Mitigation Measure GEO-7** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Ensure compliance with the Paleontological Resources Preservation Act, the Federal Land Policy and Management Act, the Antiquities Act, Section 5097.5 of the PRC, adopted county and city general plans, and other federal, state, and local regulations, as applicable and feasible, by adhering to and incorporating the performance standards and practices for the assessment and mitigation of adverse impacts on paleontological resources. ◢ Obtain review by a qualified paleontologist to determine whether the project has the potential to require ground disturbance of parent material with potential to contain unique paleontological resources or to require the substantial alteration of a unique geologic feature. The assessment should include museum records searches, a review of geologic mapping and the scientific literature, geotechnical studies (if available), and potentially a pedestrian survey if units with paleontological potential are present at the surface. ◢ Avoid exposure or displacement of parent material with potential to yield unique paleontological resources. ◢ Implement the following measures where avoidance of parent material with the potential to yield unique paleontological resources is not feasible: ▪ All on-site construction personnel shall receive Worker Education and Awareness Program training before the commencement of excavation work to understand the regulatory framework that provides for protection of paleontological resources and become familiar with diagnostic characteristics of the materials with the potential to be encountered. ▪ A qualified paleontologist shall prepare a paleontological resource management plan (PRMP) to guide the salvage, documentation, and repository of unique paleontological resources encountered during construction. If unique	LTS-M	SU

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		paleontological resources are encountered during construction, qualified paleontologist shall oversee the implementation of the PRMP. ▪ Ground-disturbing activities in parent material with a moderate to high potential to yield unique paleontological resources shall be monitored using a qualified paleontological monitor to determine whether unique paleontological resources are encountered during such activities, consistent with the specified or comparable protocols. ◢ Identify where ground disturbance is proposed in a geologic unit having the potential to contain fossils, and specify the need for a paleontological monitor to be present during ground disturbance in these areas. ◢ Avoid routes and project designs that would permanently alter unique geological features. ◢ Salvage and document adversely affected resources sufficient to support ongoing scientific research and education. ◢ If paleontological resources are discovered during earthmoving activities, the construction crew will be directed to immediately cease work and notify the implementing agencies and/or project sponsors. The project sponsor will retain a qualified paleontologist for identification and salvage of fossils so that construction delays can be minimized. The paleontologist will be responsible for implementing a recovery plan which could include the following: ▪ in the event of discovery, salvage of unearthed fossil remains, typically involving simple excavation of the exposed specimen but possibly also plaster-jacketing of large and/or fragile specimens, or more elaborate quarry excavations of richly fossiliferous deposits; ▪ recovery of stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including description of lithologies of fossil-bearing strata, measurement and description of the overall stratigraphic section, and photographic documentation of the geologic setting; ▪ laboratory preparation (cleaning and repair) of collected fossil remains to a point of curation, generally involving removal of enclosing rock material, stabilization of fragile specimens (using glues and other hardeners), and repair of broken specimens;		

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		▪ cataloging and identification of prepared fossil remains, typically involving scientific identification of specimens, inventory of specimens, assignment of catalog numbers, and entry of data into an inventory database; ▪ transferal, for storage, of cataloged fossil remains to an appropriate repository, with consent of property owner; ▪ preparation of a final report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the curated collection; and ▪ project sponsors shall comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect paleontological or geologic resources. ◢ Prepare significant recovered fossils to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological curation facility. ▪ Following the conclusion of the paleontological monitoring, ensure that the qualified paleontologist prepares a report stating that the paleontological monitoring requirement has been fulfilled and summarizes the results of any paleontological finds. The report should be submitted to the CEQA lead agency and to the repository curating the collected artifacts and should document the methods and results of all work completed under the PRMP, including the treatment of paleontological materials; results of specimen processing, analysis, and research; and final curation arrangements.		
Impact MR-1: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or a locally-important mineral resources recovery site delineated on a local land use plan	LTS	None required	LTS	LTS
3.9 Hazards and Wildfire				
Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	LTS	None required	LTS	LTS

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Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	LTS	None required	LTS	LTS
Impact HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school	LTS	None required	LTS	LTS
Impact HAZ-4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment	PS	**Mitigation Measure HAZ-4** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ The project proponent shall perform a records review to determine whether there is existing permitted use of hazardous materials or documented evidence of hazardous waste contamination on the project site and provide the results of this investigation to the implementing agency. ◢ For any project located on or near a hazardous materials and/or waste site pursuant to Government Code Section 65962.5 or sites that have the potential for residual hazardous materials as a result of historic land uses, project proponents shall prepare a Phase I ESA in accordance with the American Society for Testing and Materials' E1527-05 standard. ◢ For any project located on or near sites that are not listed and do not have the potential for residual hazardous materials as a result of historic land uses, no action is required unless unknown hazards are discovered during development. In that case, the implementing agency shall discontinue development until DTSC, RWQCB, the local air district, and/or other responsible agency issues a determination, which would likely require a Phase I ESA as part of the assessment. ◢ Develop, train, and implement worker awareness and protective measures to minimize worker and public exposure to an acceptable level and to prevent environmental contamination as a result of construction. ◢ Projects preparing a Phase I ESA, where required, shall fully implement the recommendations contained in the report. If a Phase I ESA indicates the presence or likely presence of contamination, the project proponent shall prepare a Phase II ESA, and recommendations of the Phase II ESA shall be fully implemented.	LTS-M	SU

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		◢ Consult with the appropriate local, State, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps.		
Impact HAZ-5: Result in a safety hazard for people residing or working in the planning area for projects located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport	LTS	None required	LTS	LTS
Impact HAZ-6: Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan	PS	**Mitigation Measure HAZ-6** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Continue to participate in the San Francisco Bay Area Regional Transportation Emergency Management (RTEMP), review the plan annually, and update as appropriate. ◢ Develop new methods of conveying projected and real time evacuation information to citizens using emerging electronic communication tools including social media and cellular networks. ◢ Adopt and/or revise, as appropriate, local emergency response and evacuation plans that address growth and potential for congestion on evacuation routes. Include contingencies for lower private automobile ownership and reliance on public transit for evacuation, consistent with the RTEMP. ◢ Require specific projects to demonstrate consistency with all applicable emergency response and evacuation plans. Where temporary road closures would be required during construction, prepare traffic mitigation plans that address traffic control and establish alternate emergency response and evacuation routes in coordination with emergency service providers.	LTS-M	SU

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Impact HAZ-7: Exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides due to projected land use patterns and infrastructure in or near State Responsibility Areas or land classified as very high hazard severity zones	PS	**Mitigation Measure HAZ-7** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Ensure that development of areas mapped by CAL FIRE as high and very high fire hazard severity zones complies with Title 14 of the California Code of Regulations minimum wildfire protection standards. ◢ Implementing agencies shall improve and educate residents and businesses regarding local emergency communications and notifications. ◢ Implementing agencies shall enforce defensible space regulations to keep overgrown and unmanaged vegetation, accumulations of trash and other flammable material away from structures. ◢ Implementing agencies shall provide public education about wildfire risk and fire prevention measures, and safety procedures and practices to allow for safe evacuation and/or options to shelter-in-place. ◢ Implementing agencies shall plan for and promote rapid revegetation of burned areas to help prevent erosion and protect bare soils. ◢ Implementing agencies shall develop a regulatory mechanism for permitting an aggressive hazardous fuels management program. ◢ Implementing agencies shall establish standards for fuel breaks that can slow or stop a wildfire advancing into a community or into the wildlands. Fuel breaks shall be strategically located to protect a community, structures, or routes of access and egress. Strategic locations may include ridgelines, greenbelts, or other locations to manage embers or support community-level fire suppression tactics. ◢ MTC shall facilitate minimizing future impacts to fire protection services through information sharing regarding fire-wise land management (vegetation data, fire-resistant building materials, locations where development is vulnerable to wildfire, and best practices for safe land management) with county and city planning departments. ◢ MTC, in partnership with technical experts and stakeholders, shall launch or continue existing initiatives to help local cities and counties to protect Bay Area communities and economies from the disruption of wildfire occurrences. Initiatives	SU	SU

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		could include but not be limited to seminars that review the risk of wildfire and approaches for preparation, including strengthening of infrastructure, emergency services, emergency evacuation plans and reviewing building safety codes.		
3.10 Hydrology and Water Quality				
Impact HYDRO-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality	LTS	None required	LTS	LTS
Impact HYDRO-2: Substantially decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin	LTS	None required	LTS	LTS
Impact HYDRO-3: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, or additional sources of polluted runoff	LTS	None required	LTS	LTS
Impact HYDRO-4: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site	LTS	None required	LTS	LTS
Impact HYDRO-5: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows	LTS	None required	LTS	LTS
Impact HYDRO-6: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation	LTS	None required	LTS	LTS

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
3.11 Land Use, Population, and Housing				
Impact LU-1: Physically divide an established community	PS	**Mitigation Measure LU-1** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ Orient transportation projects to minimize impacts on existing communities by: ▪ selecting alignments within or adjacent to existing public rights-of-way; ▪ designing sections above or below grade to maintain viable vehicular, cycling, and pedestrian connections between portions of communities where existing connections are disrupted by the transportation project; and ▪ wherever feasible incorporating direct crossings, overcrossings, or undercrossings at regular intervals for multiple modes of travel (e.g., pedestrians, bicyclists, vehicles). Where it has been determined that it is infeasible to avoid creating a barrier in an established community, encourage implementing agencies to consider other measures to reduce impacts, including but not limited to: ◢ shifting alignments to minimize the area affected; ◢ reducing the proposed right-of-way take to minimize the overall area of impact; and ◢ providing for bicycle, pedestrian, and vehicle access across improved roadways.	SU	SU
Impact LU-2: Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect	LTS	None required	LTS	LTS
Impact LU-3: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	LTS	None required	LTS	LTS
Impact LU-4: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere	PS	**Mitigation Measure LU-4** Implementing agencies and/or project sponsors shall implement, where feasible and as applicable based on project- and site-specific considerations, the mitigation measures described throughout this EIR to address the	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		effects of displacement that could result in the construction of replacement housing, including ◢ Mitigation Measures AES-1 through AES-4 ◢ Mitigation Measures AGF-1 through AGF-3 ◢ Mitigation Measures AQ-2 through AQ-4 ◢ Mitigation Measures BIO-1 through BIO-3 and BIO-5 ◢ Mitigation Measures GHG-1 and GHG-3 ◢ Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4 ◢ Mitigation Measure GEO-7 ◢ Mitigation Measures HAZ-4, HAZ-6 and HAZ-7 ◢ Mitigation Measures LU-1 ◢ Mitigation Measures NOISE-1 through Noise-4 ◢ Mitigation Measures PSR-1 and PSR-2 ◢ Mitigation Measures PUF-1 through PUF-4 ◢ Mitigation Measure TRA-2		
3.12 Noise				
Impact NOISE-1: Generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	PS	**Mitigation Measure NOISE-1** To reduce construction noise levels to achieve the applicable noise standards of the relevant jurisdiction within the plan area, implementing agencies and project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ Comply with local construction-related noise standards, including restricting construction activities to permitted hours as defined under local jurisdiction regulations. ◢ Notify residents and occupants within 294 feet of the project construction area at least 30 days in advance of anticipated times when noise levels are expected to exceed limits established in the noise element of the general plan or noise ordinance. ◢ Designate an on-site construction complaint and enforcement manager for the project. ◢ Post procedures and phone numbers at the construction site for notifying the implementing agency staff and construction contractor (during regular	SU	SU

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		construction hours and off-hours), along with permitted construction days and hours, complaint procedures, and who to notify in the event of a problem. ◢ Properly maintain construction equipment and outfit construction equipment with the best available noise suppression devices (e.g., mufflers, silencers, wraps). Equipment engine shrouds shall be closed during equipment operation. ◢ Prohibit the idling of construction equipment for extended periods of time in the vicinity of sensitive receptors. ◢ Locate all stationary equipment (e.g., generators, compressors, rock crushers, and cement mixers) and staging areas as far as possible from nearby noise-sensitive receptors, or locate such equipment to the extent feasible such that an existing or constructed noise attenuating feature (e.g., temporary noise wall or blanket) blocks the line of sight between affected noise-sensitive receptors and construction staging areas. ◢ Use hydraulically or electrically powered tools (e.g., jack hammers, pavement breakers, and rock drills) for project construction to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust should be used. External jackets on the tools themselves should be used, if such jackets are commercially available. ◢ Quieter procedures should be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures. ◢ For construction activity that would occur within a clear line of sight of an adjacent off-site sensitive receptor (as defined by the local jurisdiction), take place outside of hours during which construction activity is exempt from local noise standards, and exceed applicable construction noise standards or thresholds, the construction contractor shall install temporary sound barriers to attenuate noise, such as temporary noise curtains, sound walls, or similar products that provide a barrier to construction noise. The temporary sound barrier shall be located between the project construction noise sources and receptors to shield the receptors from construction noise. When installed properly, acoustic barriers can reduce construction noise levels by approximately 8–10 dB (EPA 1971). The installation of any temporary sound barrier shall meet all the following criteria:		

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		▪ be installed as close as feasible to the boundary of the construction site within the direct line of sight path of the nearby sensitive receptor(s); ▪ consist of durable, flexible composite material featuring a noise barrier layer bound to sound-absorptive material on one side; and ▪ consist of rugged, impervious material with a surface weight of at least 1 pound per square foot, such that a minimum of 10 dBA reduction is achieved on the receiving side of the sound barrier.		
Impact NOISE-2: Generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	PS	**Mitigation Measure NOISE-2(a)** To reduce exposure from traffic noise when significant and to achieve the applicable noise thresholds for each roadway type (i.e., 70 dBA CNEL for major roads/freeways, 65 dBA CNEL for all other roads, or as otherwise defined in applicable local noise standards), implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations to achieve noise levels in accordance with applicable local noise standards. Measures shall include those identified below (or other equally effective measures): ◢ Design adjustments to proposed roadway or transit alignments to reduce noise levels in noise-sensitive areas (e.g., below-grade roadway alignments can effectively reduce noise levels in nearby areas by providing a barrier between the source and receptor). ◢ Use techniques such as landscaped berms, reduced-noise paving materials, and traffic-calming measures in the design of transportation projects. ◢ Use rubberized asphalt or "quiet pavement" to reduce road noise for new roadway segments, roadways in which widening or other modifications require re-pavement, or normal reconstruction of roadways where re-pavement is planned. ◢ Maximize the distance between existing noise-sensitive land uses and new noise-generating facilities and transportation systems. ◢ Contribute to the insulation of buildings or construction of noise barriers around sensitive receptor properties adjacent to the transportation project. ◢ Use land use planning measures, such as zoning, restrictions on development, site design, and buffers, to ensure that future development is noise compatible with adjacent transportation facilities and land uses.	LTS-M	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		◢ Monitor the effectiveness of noise-reduction measures by taking noise measurements and installing adaptive mitigation measures to achieve the standards for ambient noise levels established by the noise element of the general plan or noise ordinance. **Mitigation Measure NOISE-2(b)** To reduce the exposure of existing sensitive receptors to non-transportation noise associated with the forecasted development pattern, implementing agencies and/or project sponsors shall, for projects with features that generate stationary noise that are near sensitive receptors, implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ Local agencies approving land use projects shall require that routine testing and preventive maintenance of emergency electrical generators be conducted during the less sensitive daytime hours (per the applicable local municipal code). Electrical generators or other mechanical equipment shall be equipped with noise control (e.g., muffler) devices in accordance with manufacturers' specifications. ◢ Maximize the distance between noise-sensitive land uses and new noise-generating facilities. ◢ Improve the acoustical insulation, window quality, and/or other soundproofing of dwelling units (existing or proposed) where setbacks do not sufficiently reduce noise. ◢ Local agencies approving land use projects shall require that external mechanical equipment, including HVAC units, associated with buildings and other stationary sources (e.g., commercial loading docks) incorporate features designed to reduce noise to below 70 dBA CNEL or the local applicable noise standard. These features may include locating equipment or activity areas in equipment rooms or enclosures that incorporate noise-reduction features, such as acoustical louvers and exhaust and intake silencers. Enclosures shall be oriented so that major openings (i.e., intake louvers, exhaust) are directed away from nearby noise-sensitive receptors. Site design considerations shall also incorporate appropriate setback distances, to the extent practical, from the noise and existing sensitive receptors to minimize noise exposure. **Mitigation Measure NOISE-2(c)** To reduce transit-related noise exposure to existing receptors within 50 feet of a rail transit line to below 70 dBA CNEL, or other applicable standard, implementing agencies and/or project sponsors shall implement measures,		

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ When finalizing development project site plans or transportation project design, sufficient setback between occupied structures and the railroad tracks shall be provided to minimize noise exposure to the extent feasible. ◢ When finalizing development project site plans, noise-sensitive outdoor use areas shall be sited as far away from adjacent noise sources as possible, and site plans shall be designed to shield noise-sensitive spaces with buildings or noise barriers whenever possible. ◢ Prior to project approval, the implementing agency for a transportation project shall ensure that the transportation project sponsor applies the following mitigation measures (or other technologically feasible measures) to achieve a site-specific exterior noise level of 70 dBA CNEL (or other applicable local noise standard) and interior noise level of 45 dBA CNEL at sensitive land uses, as applicable for transit projects: ▪ use sound reduction barriers, such as landscaped berms and dense plantings; ▪ locate rail extension below grade as feasible; ▪ use damped wheels on railway cars; ▪ use vehicle skirts; ▪ use undercar acoustically absorptive material; and ▪ install sound insulation treatments for affected structures.		
Impact NOISE-3: Generate excessive groundborne vibration or groundborne noise levels	PS	**Mitigation Measure NOISE-3(a)** To reduce construction vibration levels to acceptable levels (i.e., 65 VdB to 80 VdB depending on the frequency of the event and 0.1 to 0.6 PPV in/sec depending on building type), implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures): ◢ To minimize disturbance of receptors within 545 feet of pile-driving activities, implement "quiet" pile-driving technology (such as predrilling of piles and the use of more than one pile driver to shorten the total pile-driving duration), where feasible and as applicable, in consideration of geotechnical and structural requirements and conditions. ◢ To reduce structural damage, where pile driving is proposed within 55 feet of an existing structure, engage a qualified geotechnical engineer and qualified historic	LTS-M	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		preservation professional (for designated historic buildings only) and/or structural engineer to conduct a preconstruction assessment of existing subsurface conditions and the structural integrity of nearby (i.e., within 55 feet) structures that would be exposed to pile-driving activity. If recommended by the preconstruction assessment, for structures or facilities within 55 feet of pile-driving activities, the project sponsors shall require ground vibration monitoring of nearby structures. Such methods and technologies shall be based on the specific conditions at the construction site. Conditions will be determined through activities such as the preconstruction surveying of potentially affected structures and underpinning of foundations of potentially affected structures, as necessary. The preconstruction assessment shall include a monitoring program to detect ground settlement or lateral movement of structures in the vicinity of pile-driving activities and identify corrective measures to be taken should monitored vibration levels indicate the potential for building damage. In the event of unacceptable ground movement with the potential to cause structural damage, all impact work shall cease, and corrective measures shall be implemented to minimize the risk to the subject, or adjacent, structure. ◢ Use cushion blocks to dampen impact noise from pile driving. ◢ Restrict high-impact construction activities (i.e., vibratory activities that generate 0.20 in/sec PPV or more at 25 feet) within 545 feet of sensitive receptors to permitted hours in accordance with local jurisdiction regulations. **Mitigation Measure NOISE-3(b)** To reduce vibration effects from rail operations, implementing agencies and/or project sponsors shall undertake a detailed evaluation of vibration and groundborne noise impacts and identify project-specific mitigation measures as necessary to reduce vibration to a level that complies with applicable local standards or FTA standards. To minimize the effects of vibration and groundborne noise from rail operations, the following measures (or other equally effective measures) shall be implemented where feasible and as applicable based on project- and site-specific considerations: ◢ Ensure that project sponsors apply the following measures to achieve FTA-recommended vibration levels of 72 VdB at residential land uses, or other applicable standard, for rail extension projects: ▪ Use high-resilience (soft) direct fixation fasteners for embedded track.		

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		▪ Install ballast mat, or other approved technology for the purpose of reducing vibration, for ballast and tie track. ▪ Conduct regular rail maintenance, including rail grinding and wheel truing to recontour wheels, to provide smooth running surfaces. ▪ Maximize the distance between tracks and sensitive uses. ▪ Implement operational changes, such as limiting train speed and reducing nighttime operations.		
Impact NOISE-4: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels	PS	**Mitigation Measure NOISE-4** Local lead agencies for all new development proposed to be located within an existing airport influence zone, as defined by the locally adopted ALUCP or local general plan, shall require a site-specific noise compatibility study. The study shall consider and evaluate existing aircraft noise, based on specific aircraft activity data for the airport in question, and shall include recommendations for site design and building construction to ensure compliance with interior noise levels of 45 dBA CNEL, such that the potential for sleep disturbance is minimized.	LTS-M	SU
3.13 Public Services and Recreation				
Impact PSR-1: Result in substantial adverse physical impacts associated with the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, and other public facilities	PS	**Mitigation Measure PSR-1** Implementing agencies and/or project sponsors shall implement the following measure, where feasible and as applicable based on project- and site-specific considerations: ◢ For projects that could increase demand for public services facilities, implementing agencies and/or project sponsors shall coordinate with relevant service providers to ensure that the existing public services could accommodate the increase in demand. If existing facilities are found to be inadequate to maintain adequate capital capacity, equipment, personnel, and/or response times, facility improvements for the appropriate public service shall be identified in each project's CEQA documentation. Implementing agencies and/or project sponsors shall implement, where feasible and necessary, the mitigation measures described throughout this EIR to address the environmental effects related to the construction of new or expanded public service facilities: ▪ Mitigation Measures AES-1 through AES-4 ▪ Mitigation Measures AGF-1 through AGF-3 ▪ Mitigation Measures AQ-2 through AQ-4	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		▪ Mitigation Measures BIO-1 through BIO-3 and BIO-5 ▪ Mitigation Measures GHG-1 and GHG-3 ▪ Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4 ▪ Mitigation Measure GEO-7 ▪ Mitigation Measures HAZ-4, HAZ-6 and HAZ-7 ▪ Mitigation Measures LU-1and LU-4 ▪ Mitigation Measures NOISE-1 through Noise-4 ▪ Mitigation Measures PSR-2 ▪ Mitigation Measures PUF-1 through PUF-4 ▪ Mitigation Measure TRA-2		
Impact PSR-2: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment	PS	**Mitigation Measure PSR-2** Implementing agencies and/or project sponsors shall implement, where feasible and as applicable, the mitigation measures described throughout this EIR to address the environmental effects related to the construction of new or expanded recreational facilities: ◢ Mitigation Measures AES-1 through AES-4 ◢ Mitigation Measures AGF-1 through AGF-3 ◢ Mitigation Measures AQ-2 through AQ-4 ◢ Mitigation Measures BIO-1 through BIO-3 and BIO-5 ◢ Mitigation Measures GHG-1 and GHG-3 ◢ Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4 ◢ Mitigation Measure GEO-7 ◢ Mitigation Measures HAZ-4, HAZ-6 and HAZ-7 ◢ Mitigation Measures LU-1 and LU-4 ◢ Mitigation Measures NOISE-1 through Noise-4 ◢ Mitigation Measures PSR-1 ◢ Mitigation Measures PUF-1 through PUF-4 ◢ Mitigation Measure TRA-2	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
3.14 Public Utilities and Facilities				
Impact PUF-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which could cause significant environmental effects	PS	Implement Mitigation Measures PUF-2(a), PUF-2(b), and PUF-2(c), summarized under Impact PUF-2, and PUF-3, summarized under Impact PUF-3, to reduce water demand and wastewater generation, and subsequently reduce the need for new or expanded water and wastewater treatment facilities. **Mitigation Measure PUF-1(a)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ For projects that could increase demand on water and wastewater treatment facilities, coordinate with the relevant service provider to ensure that the existing public services and utilities could accommodate the increase in demand. If the current infrastructure servicing the project site is found to be inadequate, infrastructure improvements for the appropriate public service or utility shall be identified in each project's CEQA documentation. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities. **Mitigation Measure PUF-1(b)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ During the design and CEQA review of individual future projects, determine whether sufficient stormwater drainage facilities exist for a proposed project. These CEQA determinations must ensure that the proposed development can be served by its existing or planned drainage capacity. If adequate stormwater drainage facilities do not exist, project sponsors shall coordinate with the appropriate utility and service provider to ensure that adequate facilities could accommodate the increased demand, and if not, infrastructure and facility improvements shall be identified in each project's CEQA determination. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities. ◢ For projects of greater than 1 acre in size, reduce stormwater runoff caused by construction by implementing stormwater control best practices, based on those required for a SWPPP.	SU	SU

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		◢ Model and implement a stormwater management plan or site design that prevents the post-development peak discharge rate and quantity from exceeding pre-development rates. **Mitigation Measure PUF-1(c)** Implementing agencies and/or project sponsors shall implement measures, where feasible as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures): ◢ For transportation projects, incorporate stormwater control, retention, and infiltration features, such as detention basins, bioswales, vegetated median strips, and permeable paving, early into the design process to ensure that adequate acreage and elevation contours are planned. **Mitigation Measure PUF-1(d)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below, (or equally effective measures): ◢ For transportation projects implemented by Caltrans or subject to Caltrans review, adhere to Caltrans' Stormwater Management Plan, which includes best practices to reduce the volume of stormwater runoff and pollutants in the design, construction, and maintenance of highway facilities. **Mitigation Measure PUF-1(e)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below or equally effective measures): ◢ Consider the use of on site electric generation and storage systems that produce all or a portion of the energy used by a land use, sea level rise adaptation, or transportation project. **Mitigation Measure PUF-1(f)** Implementing agencies and/or project sponsors shall implement, where feasible and as applicable based on project- and site-specific considerations, the mitigation measures described throughout this EIR to address the effects related to the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, including: ◢ Mitigation Measures AES-1 through AES-4 ◢ Mitigation Measures AGF-1 through AGF-3 ◢ Mitigation Measures AQ-2 through AQ-4 ◢ Mitigation Measures BIO-1 through BIO-3 and BIO-5		

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		◢ Mitigation Measures GHG-1 and GHG-3 ◢ Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4 ◢ Mitigation Measure GEO-7 ◢ Mitigation Measures HAZ-4, HAZ-6 and HAZ-7 ◢ Mitigation Measures LU-1 ◢ Mitigation Measures NOISE-1 through NOISE-4 ◢ Mitigation Measures PSR-1 and PSR-2 ◢ Mitigation Measures PUF-2 through PUF-4 ◢ Mitigation Measure TRA-2		
Impact PUF-2: Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years	SU	**Mitigation Measure PUF-2(a)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ For projects that could increase demand for water, coordinate with the relevant water service provider to ensure that the provider has adequate supplies to accommodate the increase in demand. This can and should be documented in the form of an SB 610 Water Supply Assessment, where applicable; an SB 221 Water Supply Verification; or other capacity analysis. ◢ Implement water conservation measures which result in reduced demand for potable water. This could include reducing the use of potable water for landscape irrigation (such as through drought-tolerant plantings, water-efficient irrigation systems, the capture and use of rainwater) and the use of water-conserving fixtures (such as dual-flush toilets, waterless urinals, reduced flow faucets). ◢ Coordinate with the water provider to identify an appropriate water consumption budget for the size and type of project and designing and operating the project accordingly. ◢ For projects located in an area with existing reclaimed water conveyance infrastructure and excess reclaimed water capacity, use reclaimed water for non-potable uses, especially landscape irrigation. For projects in a location planned for future reclaimed water service, projects should install dual plumbing systems in anticipation of future use. Large developments could treat wastewater onsite to tertiary standards and use it for non-potable uses onsite.	SU	SU

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Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		◢ Where applicable, apply Tier 1 or Tier 2 CALGreen standards as mandatory local requirements, which reduce water use by 12% and 20%, respectively, and require additional qualifying elective actions. **Mitigation Measure PUF-2(b)** Implementing agencies and/or project sponsors shall require the construction phase of transportation projects to connect to reclaimed water distribution systems for non-potable water needs, when feasible based on project- and site-specific considerations. **Mitigation Measure PUF-2(c)** Implementing agencies and/or project sponsors shall require transportation projects with landscaping to use drought-resistant plantings or connect to reclaimed water distribution systems for irrigation and other non-potable water needs when available and feasible based on project- and site-specific considerations.		
Impact PUF-3: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments	PS	**Mitigation Measure PUF-3** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ During the design and CEQA review of individual future projects, determine whether sufficient wastewater treatment capacity exists for a proposed project. These CEQA determinations must ensure that the proposed development can be served by its existing or planned treatment capacity. If adequate capacity does not exist, project sponsors shall coordinate with the relevant service provider to ensure that adequate public services and utilities could accommodate the increased demand, and if not, infrastructure improvements for the appropriate public service or utility shall be identified in each project's CEQA documentation. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities. ◢ Require compliance with Mitigation Measure PUF-2(a), and MTC shall require implementation of Mitigation Measures PUF-2(b) and PUF-2(c), as feasible based on project- and site-specific considerations to reduce water usage and, subsequently, some wastewater flows.	LTS-M	SU
Impact PUF-4: Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals, and comply with federal, state,	PS	**Mitigation Measure PUF-4** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below: ◢ Provide an easily accessible area that is dedicated to the collection and storage of non-hazardous recycling materials.	SU	SU

*= Significance assuming individual projects adopt and implement the listed mitigation measure, as required for future projects taking advantage of CEQA streamlining provisions of SB 375.

**= Significance assuming some or all of the listed mitigation measure(s) is/are not implemented because MTC and ABAG cannot require local implementing agencies to adopt mitigation measure(s).

LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable PSU = Potentially significant and unavoidable

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
and local management and reduction statutes and regulations related to solid waste		◢ Maintain or reuse existing building structures and materials during building renovations and redevelopment. ◢ Use salvaged, refurbished, or reused materials to help divert such items from landfills. ◢ Divert construction waste from landfills, where feasible, through means such as: ▪ submitting and implementing a construction waste management plan that identifies materials to be diverted from disposal; ▪ establishing diversion targets, possibly with different targets for different types and scales of development; and ▪ helping developments share information on available materials with one another, to aid in the transfer and use of salvaged materials. ◢ Apply the specifications developed by the Construction Materials Recycling Association (CMRA) to assist contractors and developers in diverting materials from construction and demolition projects, where feasible (CalRecycle 2006).		
3.15 Transportation				
Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities	LTS	None required	LTS	LTS
Impact TRA-2: Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b)	PS	**Mitigation Measure TRA-2(a)** MTC shall work with State and local agencies to ensure implementation of components of the plan that will help to reduce regional VMT, particularly projects that improve or expand transit service, as well as bicycle and pedestrian facilities. These transportation projects, in conjunction with land use policies included in the plan, will help the region to achieve the projected decreases in regional VMT per capita and achieve the region's SB 375 targets for GHG emissions. MTC will collaborate with State and other agencies to explore the feasibility of new programs for reducing VMT, such as VMT fees, banks, and exchanges. **Mitigation Measure TRA-2(b)** Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, consistent with MTC's "Key SB 743 Implementation Steps for Land Use Projects" that consist of but are not limited to those identified below (or equally effective measures):	SU	SU

*= Significance assuming individual projects adopt and implement the listed mitigation measure, as required for future projects taking advantage of CEQA streamlining provisions of SB 375.

**= Significance assuming some or all of the listed mitigation measure(s) is/are not implemented because MTC/ABAG cannot require local implementing agencies to adopt mitigation measure(s).

LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable PSU = Potentially significant and unavoidable

Impacts	Significance before Mitigation	Mitigation Measures	Significance after Mitigation w/ MM*	Significance after Mitigation w/o MM**
		TDM strategies shall be incorporated into individual land use and transportation projects and plans, as part of the planning process. These TDM measures are strategies not included in EN9, rather they are measures that could and should be implemented by the local agency based on land use authority that neither MTC nor ABAG has. Local agencies shall incorporate strategies identified in the Federal Highway Administration's (FHWA's) publication: Integrating Demand Management into the Transportation Planning Process: A Desk Reference (August 2012) into the planning process (FHWA 2012). For example, the following strategies may be included, as applicable, to encourage use of transit and nonmotorized modes of transportation and reduce VMT on the region's roadways: ◢ include TDM mitigation requirements for new developments; ◢ incorporate supporting infrastructure for nonmotorized modes, such as bike lanes, secure bike parking, sidewalks, and crosswalks; ◢ provide incentives to use alternative modes and reduce driving, such as universal transit passes, road and parking pricing; ◢ implement parking management programs, such as parking cash-out, priority parking for carpools and vanpools; ◢ develop TDM-specific performance measures to evaluate project-specific and system-wide performance; ◢ incorporate TDM performance measures in the decision-making process for identifying transportation investments; ◢ implement data collection programs for TDM to determine the effectiveness of certain strategies and to measure success over time; and ◢ set aside funding for TDM initiatives. **Mitigation Measure TRA-2(c)** Implementing agencies and/or project sponsors shall implement the following measure, where applicable and necessary based on project- and site-specific considerations (or equally effective measures): ◢ Implement Mitigation Measure GHG-3		
Impact TRA-3: Substantially increase hazards due to geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	LTS	None required	LTS	LTS
Impact TRA-4: Result in inadequate emergency access	LTS	None required	LTS	LTS

*= Significance assuming individual projects adopt and implement the listed mitigation measure, as required for future projects taking advantage of CEQA streamlining provisions of SB 375.

**= Significance assuming some or all of the listed mitigation measure(s) is/are not implemented because MTC and ABAG cannot require local implementing agencies to adopt mitigation measure(s).

LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable PSU = Potentially significant and unavoidable

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1 INTRODUCTION

This environmental impact report (EIR) has been prepared on behalf of the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) in accordance with the California Environmental Quality Act (CEQA). It analyzes the potentially significant impacts of adopting and implementing the proposed Plan Bay Area 2050+ (proposed plan), which is the update to Plan Bay Area 2050, and serves as the Regional Transportation Plan (RTP) and the Sustainable Communities Strategy (SCS) for the San Francisco Bay Area.

1.1 PURPOSE OF PLAN BAY AREA 2050+

An RTP is a long-range plan that identifies the strategies and investments to maintain, manage, and improve the region's transportation network. As required by State legislation (Government Code Section 65080 et seq.) and by federal regulation (Title 23 US Code Section 134), MTC is responsible for preparing the RTP for the San Francisco Bay Area region. RTP must be updated every 4 years. The Sustainable Communities and Climate Protection Act of 2008, commonly known as Senate Bill (SB) 375 (Chapter 728, Statutes of 2008), requires California's 18 metropolitan planning organizations (including MTC) to develop an SCS as an element of the federally mandated RTP. The SCS is a long-range growth strategy for the region that, when combined with the transportation network, strives to achieve State greenhouse gas (GHG) emissions reduction targets. The SCS demonstrates how the region will meet its GHG reduction target established by the California Air Resources Board (CARB) through integrated land use, housing, and transportation planning. In the Bay Area, MTC and ABAG are jointly responsible for this planning effort. The draft plan, supplementary reports, and other technical documents on the planning process can be found at the Plan Bay Area 2050+ website: planbayarea.org/draftplan.

The most recent long-range plan for the Bay Area—Plan Bay Area 2050—was adopted in 2021. As the Bay Area's third RTP to include an SCS, the 2021 plan included a comprehensive update of Plan Bay Area 2040, adopted in 2017, and expanded the scope relative to prior plans by examining the themes of economic development and environmental resilience, and provided a more thorough financial accounting of regional affordable housing needs. The proposed plan will serve as the fourth RTP/SCS for the Bay Area, and is a "limited and focused" update of Plan Bay Area 2050 that does not include a parallel Regional Housing Needs Allocation (RHNA) process, as specified by California statute. The plan meets all State and federal requirements for an RTP/SCS. The proposed plan focuses on four key issues—transportation, housing, the economy, and the environment—and has been developed to improve equitable outcomes for all Bay Area residents and to provide greater resilience in an uncertain future.

The proposed plan is a long-range plan that specifies the strategies and investments to maintain, manage, and improve the region's transportation network, including improvements to bicycle and pedestrian facilities, local streets and roads, public transit systems, and highways. The proposed plan also calls for focused housing and job growth around high-quality transit corridors. This land use approach is anticipated to enhance mobility and economic growth by linking the location of housing and jobs with transit, thus offering a more efficient land use pattern around transit and improved existing and planned transit investments. Similar to Plan Bay Area 2050, the proposed plan has integrated the issue of sea level rise inundation and identifies a strategy to protect shoreline communities affected by anticipated sea level rise through a series of adaptation projects. The adaptation projects include actions that have been identified for regularly inundated shoreline areas. Actions include elevated roadways, a variety of levees, seawalls, tidal gates, and marsh restoration.

Once adopted, Plan Bay Area 2050+ will be reviewed by CARB to confirm whether it would, if implemented, achieve the GHG emission reduction target for the region. If the combination of strategies in the SCS is determined to be insufficient to achieve the region's target, an alternative planning strategy to achieve the targets must be prepared. For additional background on Plan Bay Area 2050+, see Section 1.7, "Plan Bay Area 2050+ Background."

1.2 PURPOSE OF THIS EIR

This EIR has been prepared in compliance with the CEQA statutes and guidelines. In general, the purpose of this EIR is to:

- analyze the potential environmental effects of adopting and implementing the proposed plan;
- inform decision makers, responsible and trustee agencies, and members of the public as to the range of the environmental impacts of the proposed plan;
- recommend mitigation measures to mitigate significant adverse impacts; and
- analyze a range of reasonable alternatives to the proposed plan.

The Final EIR will include a mitigation monitoring and reporting program that identifies responsibility for implementing identified mitigation measures and required timing for implementation. As joint lead agencies for preparing this EIR, MTC and ABAG will rely on the EIR analysis of potential environmental effects in their review and consideration of the proposed plan prior to approval.

As discussed in further detail below in Section 1.9, "CEQA Streamlining Opportunities," SB 375 provides streamlining benefits for certain transit-oriented projects consistent with an adopted SCS. Pursuant to these provisions of SB 375, this EIR has also been prepared to allow qualifying projects to streamline their environmental review.

1.3 NOTICE OF PREPARATION AND PUBLIC SCOPING

CEQA requires an early and open process for determining the scope of issues that should be addressed in the EIR. The Notice of Preparation provides formal notification to all federal, State, regional, and local agencies involved with funding or approval of the project, and to other interested organizations and members of the public, that an EIR will be prepared for the project. The Notice of Preparation is intended to encourage interagency communication concerning the proposed plan and to provide background information about the proposed plan sufficient to allow agencies, organizations, and individuals to respond with specific comments and questions on the scope and content of the EIR. A copy of the Notice of Preparation is provided in Appendix A; the written comments received during the 30-day Notice of Preparation period are provided in Appendix B. The Notice of Preparation is available on the project website: https://www.planbayarea.org.

MTC and ABAG initiated the scoping process on January 14, 2025, through issuance of the Notice of Preparation. As required by CEQA, MTC and ABAG sent a copy of the Notice of Preparation to the State Clearinghouse within the Governor's Office of Land Use and Climate Innovation and to the county clerks in each of the nine Bay Area counties. The Notice of Preparation was also posted on the Plan Bay Area website (https://www.planbayarea.org) and distributed to State and federal resource agencies and to interested individuals and organizations.

1.3.1 Scoping Meetings

A scoping meeting is required by State CEQA Guidelines Section 15082(c)(1) for projects of statewide, regional, or areawide significance. Similar to circulation of the Notice of Preparation, the purpose of the scoping meeting is to provide notification that an EIR for Plan Bay Area 2050+ was being prepared and to solicit input on the scope and content of the environmental document. The virtual scoping meeting was held on Wednesday, January 29, 2025, from 1:00 p.m. to 2:30 p.m. At this meeting, a presentation by MTC staff provided an overview of the proposed plan, the CEQA process, and key environmental issues identified in the Notice of Preparation. No oral comments were received during the meeting.

The Notice of Preparation and public scoping meeting also helped to meet federal requirements for public involvement in development of the RTP, as specified in 23 US Code 134(i), the Moving Ahead for Progress in the 21st Century Act, the Fixing America's Surface Transportation Act, and Infrastructure Investment and Jobs Act. In particular, through the Notice of Preparation and scoping process, resource agencies, public agencies, tribal governments, transportation providers, and the public had an opportunity to provide early input on environmental issues and concerns that could be addressed in the EIR for the proposed plan.

In addition, SB 375 requires opportunities for input by local officials and the public into the development of the SCS and the alternative planning strategy if one is prepared. Participation requirements include regional target workshops and development of an SCS public participation plan. However, because the plan contains the same target as CARB set for Plan Bay Area 2050, no target-setting workshop was required for the plan. Additional information about the comprehensive public involvement process for the proposed plan is available at https://www.planbayarea.org and is described further in Section 1.7.6, "Public Engagement."

In addition to circulating the Notice of Preparation and holding the scoping meeting, MTC initiated tribal consultation consistent with Assembly Bill 52, Statutes of 2014. This process is discussed in more detail in Section 3.7, "Cultural Resources and Tribal Cultural Resources."

1.4 EIR SCOPE

1.4.1 Program EIR

This is a program EIR, which is defined in Section 15168 of the State CEQA Guidelines as an EIR addressing a series of actions that can be characterized as one large project and are related either:

(1) geographically,

(2) as logical parts in the chain of contemplated actions;

(3) in connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or

(4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

A program EIR can be used as the basic, general environmental assessment for an overall program of projects developed over a multiyear planning horizon; therefore, it is an appropriate review document for the proposed RTP/SCS. A program EIR offers several advantages. For example, it provides a basic

reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. It also allows the lead agency to consider the broad, regional impacts of a program of actions before its adoption and eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts.

1.4.2 Level of Analysis

This EIR presents a programmatic assessment of the potential impacts of the proposed plan, focusing on the entire set of projects, programs, and strategies contained in the proposed plan. Individual transportation, sea level rise adaptation, and development project impacts are not addressed in detail. The analysis focuses on these three categories of projects at the local (county) and regional (Bay Area) level. Impacts are analyzed from a regional and local perspective, as applicable.

For location-based impact assessments, geographic information system (GIS) was used to digitally overlay onto resource-related data, the footprint of the proposed plan associated with the forecasted land use growth footprint and footprints of sea level rise adaptation projects and transportation projects. Results are presented for the region and, where relevant, for each county. Where impacts are quantified through modeling or GIS analysis, they are reported at the regional and/or county level in tables and in the text. Information provided by county includes both incorporated and unincorporated areas in the county. The plan's Growth Geographies are the geographic areas where land use strategies were applied, intended to guide where future growth in housing and jobs would be focused; they are not intended to estimate areas of potential land conversion. Additionally, future development is not solely limited to Growth Geographies; instead they are places likely to accommodate the majority of new residents and jobs. Therefore, this EIR uses the land use growth footprint and the footprints for sea level rise adaptation projects and transportation projects to capture impacts from the proposed plan, as described in more detail in Chapter 2, "Project Description."

The analysis in this EIR does not evaluate project-specific impacts of individual projects, although it provides environmental analysis and mitigation that is intended to address the range of impacts that may be associated with individual projects. This approach does not relieve local jurisdictions of responsibility for determining whether project-specific impacts require additional CEQA analysis; see Section 1.8, "Future Environmental Review," below, for more details.

1.5 EIR ORGANIZATION

1.5.1 Executive Summary

The executive summary in this EIR outlines the proposed plan and alternatives and includes a summary of the potentially significant adverse environmental impacts of the proposed plan, the measures identified to mitigate those impacts, and an overview of whether or not identified measures would mitigate the significant impacts and to what level. The executive summary also discusses the environmentally superior alternative, and identifies "areas of controversy" and "issues to be resolved" as required by CEQA.

1.5.2 Chapter 1: Introduction

Chapter 1, "Introduction," describes the relationship between the proposed plan and the EIR, the organization of the EIR, and the basic legal requirements of a program-level EIR. It discusses the level of analysis and the alternatives considered, as well as how this EIR is related to other environmental documents and the EIR's

intended uses. This is followed by more content on the regional setting and regulatory framework that provides the context for the proposed plan. This background information is followed by a discussion of plan development and public engagement processes, as well as planning assumptions.

1.5.3 Chapter 2: Project Description

Chapter 2, "Project Description," describes the proposed plan and the project objectives and includes a discussion on planning assumptions and the plan's strategies and resulting forecasted changes.

1.5.4 Chapter 3: Environmental Impacts and Mitigation Measures

Chapter 3 presents the environmental analysis of the proposed plan. Section 3.1 provides an overview of the approach to the environmental analysis. Sections 3.2 through 3.15 describe the existing physical and regulatory settings for each of the environmental issue areas analyzed in this EIR, the potential impacts of the proposed plan on these environmental issue areas, and measures to mitigate the significant and potentially significant impacts identified. Each issue area is analyzed in a separate section, and each section is organized into the following subsections:

- "Environmental Setting,"
- "Regulatory Setting,"
- "Impact Analysis" which includes,
  - "Significance Criteria,"
  - "Method of Analysis," and
  - "Impacts and Mitigation Measures."

1.5.5 Chapter 4: Alternatives

Chapter 4 contains a description and analysis of the alternatives to the proposed plan. It provides an initial assessment of the potential of each alternative to achieve the objectives of the proposed plan while reducing potentially significant adverse environmental impacts. This discussion also includes a comparison summary table of regional environmental impacts associated with the alternatives, and information regarding the environmentally superior alternative.

1.5.6 Chapter 5: Other CEQA-Mandated Sections

Chapter 5 provides an assessment of the impacts of the proposed plan in several subject areas required by CEQA, consisting of the following:

- significant irreversible environmental changes,
- significant and unavoidable impacts,
- growth-inducing impacts,
- cumulative impacts, and
- impacts found to be not significant.

1.5.7 Chapter 6: Report Preparers

Chapter 6 contains a list of report authors and others consulted for preparation of this EIR.

1.5.8 Chapter 7: References

Chapter 7 lists the references used to support preparation of this EIR.

1.5.9 Appendices

Appendix A includes the Notice of Preparation of this EIR, and Appendix B includes the comments received on the Notice of Preparation and at the scoping meetings, as well as the Scoping Summary Report. Appendix C includes air quality modeling data. Appendix D includes special-status species data. Appendices E and F include detailed data used to support impact analyses related to energy, and climate change and GHG emissions. Appendix G presents input and output data used for the impact analyses in Section 3.12, "Noise."

1.6 EIR APPROACH

1.6.1 Baseline Assumptions

The analysis in this EIR generally assumes 2025 as the base year (existing conditions). This EIR uses data from this year or the year closest to 2025, based on the degree that information is available from across the region. However, the analyses of air quality in Section 3.4, "Air Quality"; GHG emissions and energy in Section 3.6, "Climate Change, Greenhouse Gases, and Energy"; noise in Section 3.12, "Noise"; and transportation in Section 3.15, "Transportation," use data from 2023 consistent with the assumptions for land use and traffic volumes in Travel Model 1.6, as that data is the most robust for those impact areas, and therefore most accurately reflects existing conditions. Additionally, the analysis of GHG emissions in Section 3.6 includes a 2005 baseline to satisfy statutory requirements under SB 375. Additionally, Section 3.11, "Land Use, Population, and Housing" uses 2020 data consistent with the most recent population information and plan's growth forecast, as described in Section 2.0, "Project Description." The proposed plan has a horizon year of 2050 and therefore covers a 25-year planning period. Projects and programs identified in the proposed plan are assumed to be fully implemented by 2050.

1.6.2 Alternatives

CEQA requires EIRs to evaluate a reasonable range of alternatives to the proposed project that could feasibly attain most of the basic project objectives and that would avoid or substantially lessen any of the significant environmental impacts. In addition, CEQA requires assessment of the likely foreseeable future condition if the proposed project were not implemented; this scenario is called the No Project Alternative.

This EIR describes a number of alternatives to the proposed plan, several of which were dismissed from further consideration. The EIR evaluates the proposed plan and the following three alternatives, assuming the 2050 horizon year and full implementation. It also compares the relative magnitude of identified environmental impacts of the alternatives to the proposed plan and discusses the environmentally superior alternative.

The proposed plan and three alternatives are briefly described below. A full description of each alternative is provided in Chapter 4.

NO PROJECT ALTERNATIVE

An EIR must analyze the "no project alternative" (CEQA Guidelines Section 15126.6[e]). The purpose of the no project alternative is to allow a comparison of the environmental impacts of approving the proposed project with the effects of not approving it. The no project alternative must discuss the existing conditions, "as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." This alternative represents a future land use pattern and suite of transportation and sea level rise adaptation projects consistent with local general plans and zoning that would be reasonably expected to occur if the proposed plan is not adopted. The No Project Alternative illustrates trends assumed under adopted local general plans and zoning without an adopted regional plan, and assuming no new transportation or sea level rise adaptation projects beyond those currently under construction or those that have both full funding and environmental clearance ("committed"). Under the No Project Alternative, housing growth would be more dispersed, while job growth would be slightly more concentrated in San Francisco and the northern portion of the Bay Area. In comparison to the proposed plan, the No Project Alternative would result in higher household growth primarily in Contra Costa, Napa, and Santa Clara Counties, with higher job growth in San Francisco, Alameda, Contra Costa, Marin, Napa, and Sonoma Counties. The No Project Alternative includes substantially lower funding for all transportation strategies and environment strategies than the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative (Alternative 1) would retain the housing, economy, and environment strategies included in the proposed plan. Under this alternative, modifications are limited to the plan's transportation strategies, specifically through the removal of regionally significant roadway expansion and extension projects under Strategies T6, T7, T8, and T11. These projects include general purpose freeway lanes, auxiliary lanes, high-occupancy vehicle (HOV) lanes, express lanes, major interchange improvements involving auxiliary lanes, and principal arterial expansions. Funding previously allocated to these roadway projects would instead be redirected to support increased transit service across all Bay Area transit operators. This alternative prioritizes transit-focused investments to create a more connected and affordable Bay Area. By shifting from highway expansion to improved transit, it enhances access to opportunity, reduces reliance on automobile travel, and lowers greenhouse gas emissions—supporting a healthy environment. While maintaining the proposed plan's land use framework, this alternative positions transit as the core of regional mobility, helping to foster a more diverse and vibrant region where all residents can thrive.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative (Alternative 2) would retain all strategies in the proposed plan, including those related to transportation, housing, the economy, and the environment. However, unlike the proposed plan, which applies its housing and economy strategies across a broad range of Growth Geographies (see Chapter 2, "Project Description"), this alternative would focus application of these strategies primarily within Transit-Oriented Communities (TOC) Policy Areas, thus increasing development capacity in areas close to major transit infrastructure. TOC Policy Areas are defined as the half-mile radius surrounding existing and planned fixed-guideway transit stations—including regional rail, commuter rail, light rail, bus rapid transit, and ferry terminals—based on proximity rather than local jurisdictional designation. By focusing application of housing and economy strategies within TOC Policy Areas, this alternative targets the plan's growth-supportive land use and economic development efforts within areas most directly served by

major transit infrastructure. Additionally, this alternative seeks to improve the effectiveness of existing and planned transit services, reduce reliance on automobile travel, and encourage more compact, walkable, and transit-supportive communities. These changes support a connected and healthy Bay Area by lowering greenhouse gas emissions and improving access to reliable transportation, while also fostering diverse and vibrant communities where more residents can live near high-quality transit.

1.6.3 Cumulative Impact Assumptions

Section 15130 of the CEQA Guidelines requires that an EIR evaluate potential environmental impacts that are individually limited but cumulatively significant. CEQA defines "cumulative impacts" as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). "'Cumulatively considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (CEQA Guidelines Section 15065[a][3]). This means that cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The proposed plan, which includes a forecasted land use growth footprint for the Bay Area to accommodate projected regional growth through 2050, as well as regionwide transportation projects and programs, is a cumulative plan by definition. For this reason, the environmental analysis included in this EIR is a cumulative analysis to the extent that impacts may combine to result in a cumulative condition, compliant with the requirements of CEQA and the CEQA Guidelines. Furthermore, this EIR contains analysis of cumulative impacts that extend beyond the region for identified CEQA impact areas. This discussion is included in Section 5.4.

1.7 PLAN BAY AREA 2050+ BACKGROUND

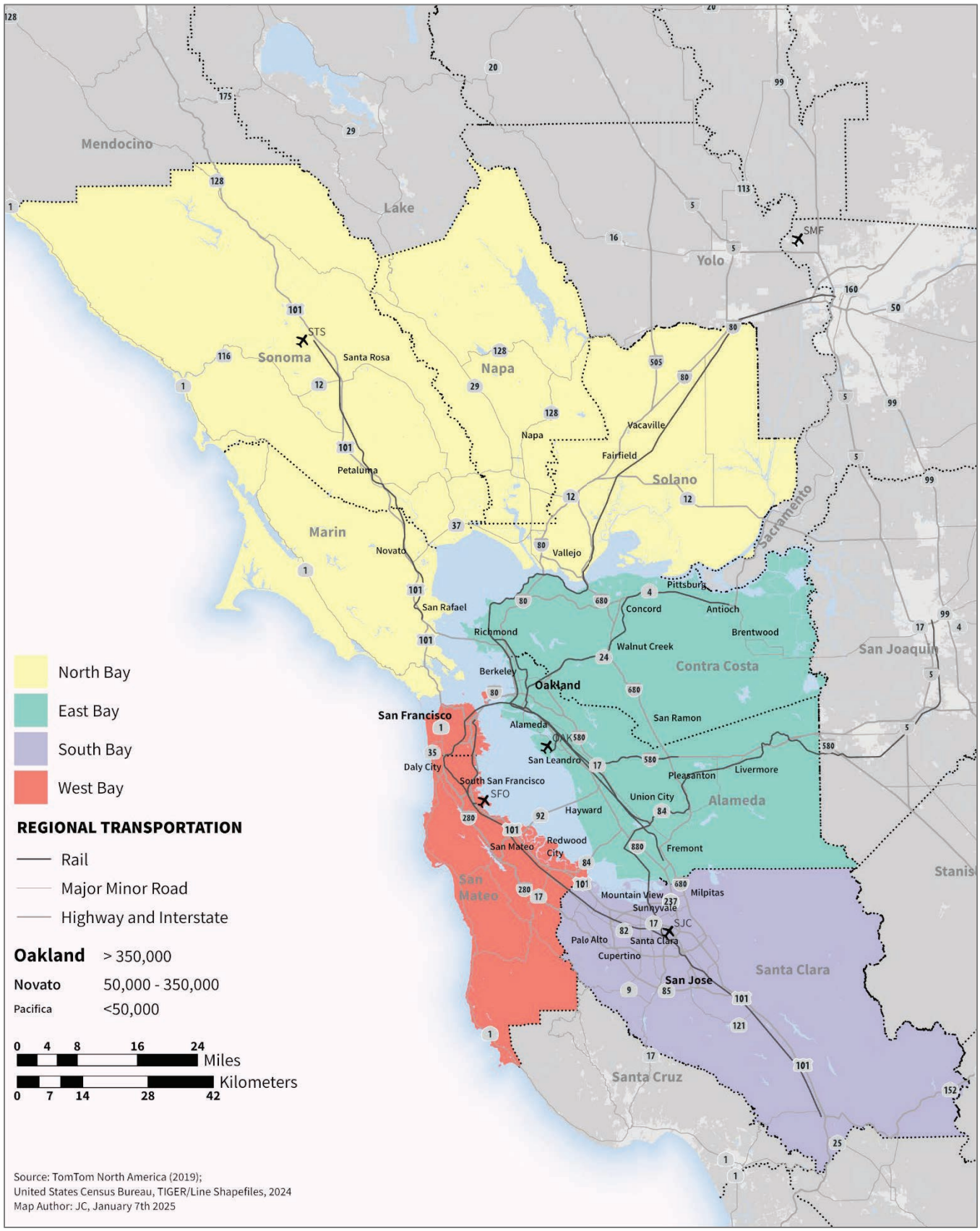
1.7.1 Regional Location and General Settings

REGION

The San Francisco Bay Area region includes nine counties that may be aggregated geographically into four subareas: North Bay (Marin, Napa, Solano, and Sonoma Counties), East Bay (Alameda and Contra Costa Counties), South Bay (Santa Clara County), and the West Bay (San Francisco and San Mateo Counties). There are 101 cities spread throughout these nine counties. The total area of the region is approximately 4.4 million acres (7,000 square miles). The region is bordered by Mendocino, Lake, and Yolo Counties to the north; Sacramento, San Joaquin, Stanislaus, and Merced Counties to the east; San Benito, Monterey, and Santa Cruz Counties to the south; and the Pacific Ocean to the west. As of January 2024, the region had a population estimate of 7.59 million, which is approximately 19% of California's population. Roughly 18% of the region's approximately 4.4 million acres were developed in 2022 (see **Table 2-3**). The undeveloped area includes open space and agricultural lands, as well as water bodies (excluding the San Francisco Bay) and parks. The region contains approximately 1 million acres of parks and open space (Bay Area Open Space Council 2024). **Figure 1-1** illustrates the regional location of the Bay Area. More information about the physical setting is provided by environmental issue area in the setting sections throughout Chapter 3 of this EIR.

A summary of the region by subarea and county is provided below.

Figure 1-1: Regional Location



Source: TomTom North America 2019; US Census 2024.

North Bay Counties

Marin County covers an area of approximately 518 square miles that contains 11 incorporated cities (Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, and Tiburon) and eight unincorporated communities. San Rafael is the city with the highest population level in the county, with approximately 60,000 people. Overall, the county has approximately 253,000 residents, according to 2024 estimates from the California Department of Finance (DOF 2024).

Napa County covers an area of approximately 789 square miles and contains a population of approximately 135,000 people. There are five incorporated cities within Napa County: American Canyon, Calistoga, Napa, St. Helena, and Yountville; the city with the highest population is Napa, where approximately 77,000 people reside. Napa County also contains 20 unincorporated communities (DOF 2024).

Solano County is home to approximately 446,000 people, over an area of 906 square miles. There are seven incorporated cities in Solano County (Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo) and eight unincorporated communities. Of these incorporated cities, Vallejo has the highest population, with approximately 122,000 people (DOF 2024).

Sonoma County has a population of approximately 478,000 people and covers an area of approximately 1,768 square miles. There are nine incorporated cities within Sonoma County (Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor) and over 25 unincorporated communities. Of these cities, Santa Rosa has the highest population, with approximately 175,000 residents (DOF 2024).

East Bay Counties

Alameda County is home to over 1.64 million people living in 14 incorporated cities, as well as in six unincorporated communities and rural areas. Total land area measures approximately 813 square miles. The incorporated cities are Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City. The City of Oakland has the highest population among the incorporated cities, with approximately 425,000 people (DOF 2024). Oakland is the third most populated jurisdiction in the region.

Contra Costa County has a population of more than 1.14 million residents. This county contains 19 incorporated cities (Antioch, Brentwood, Clayton, Concord, Danville, El Cerrito, Hercules, Lafayette, Martinez, Moraga, Oakley, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek) and many established communities in the unincorporated area. The city with the highest population level is Concord, with approximately 122,000 people (DOF 2024). Contra Costa County covers an area of approximately 804 square miles.

COUNTIES

South Bay Counties

Santa Clara County is home to approximately 1,903,000 people and covers approximately 1,302 square miles. Thirteen incorporated cities are located within Santa Clara County (Campbell, Cupertino, Gilroy, Los Altos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alta, San Jose, Santa Clara, Saratoga, and Sunnyvale) and two incorporated towns (Los Gatos and Los Altos Hills). Of the incorporated cities and towns, the highest population is located in San Jose, where over 969,000 people reside. The City of San Jose is the most populated jurisdiction in the Bay Area region (DOF 2024).

West Bay Counties

San Francisco County and the City of San Francisco occupy the same physical area, covering approximately 48 square miles. Approximately 843,000 people reside within the City and County of San Francisco. San Francisco is the second most populated city in the Bay Area region (DOF 2024).

San Mateo County covers approximately 744 square miles and is home to approximately 742,000 people. The county includes 16 incorporated cities (Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco) and eight unincorporated communities. Of the incorporated cities, the City of San Mateo has the highest population, approximately 103,000 people (DOF 2024).

1.7.2 Regional Planning Agencies

MTC was formed in 1970 and functions under State and federal law as the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. It covers the same geographic area as ABAG. MTC is the federally designated metropolitan planning organization (MPO) and the State-designated regional transportation planning agency (RTPA) for the Bay Area. It is responsible for preparing and updating the RTP every 4 years.

ABAG was formed in 1961 by a joint powers agreement among Bay Area local governments and serves as the comprehensive regional planning agency and Council of Governments for the nine counties and 101 cities and towns of the San Francisco Bay region. It is a public entity created by local governments to meet their planning and research needs related to land use and is responsible under State law for conducting the Regional Housing Needs Allocation process. ABAG also hosts several joint powers and administrative entities related to environmental and water resource protection, disaster resilience, energy efficiency, hazardous waste mitigation, financial services, and staff training to local counties, cities, and towns.

1.7.3 Federal and State Requirements

METROPOLITAN PLANNING GENERAL REQUIREMENTS

Under the Fixing America's Surface Transportation Act (FAST Act) (Public Law 114-94) Moving Ahead for Progress in the 21st Century Act (MAP-21) (Public Law 112-141), and the Infrastructure Investment and Jobs Act (Public Law 117-58) the US Department of Transportation requires that MPOs, such as MTC, prepare long-range RTPs and update them every 4 years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. Prior to enactment of MAP-21, the primary federal requirements regarding RTPs were included in the metropolitan transportation planning rules (Title 23 Code of Federal Regulations Part 450 and 49 CFR Part 613). The FAST Act and MAP-21 changed the statutes that underpin these regulations.

REGIONAL TRANSPORTATION PLAN REQUIREMENTS

In accordance with federal planning requirements, an RTP is a long-range plan that identifies the strategies and investments to maintain, manage, and improve the region's transportation network. The RTP must address no less than a 20-year planning horizon and include long-range and short-range strategies and actions that support the development of an integrated multimodal transportation system. The RTP must be updated at least every 4 years and seek to address projected transportation demand over the RTP planning horizon and pursue operational and management strategies that will improve the performance of the transportation system. It must have a fiscally constrained financial plan that demonstrates how the RTP can

be implemented and how the transportation system can be operated and maintained using revenues reasonably expected to be available over the planning horizon. The RTP also is subject to myriad State and federal requirements with respect to public participation and air quality conformity, among others. As required by State legislation (Government Code Section 65080 et seq.) and by federal regulation (Title 23 US Code Section 134), MTC is responsible for preparing the RTP for the San Francisco Bay Area region.

An RTP outlines the region's goals and strategies for meeting current and future mobility needs and for providing a foundation for transportation planning and funding decisions by local, regional, and State officials that are ultimately aimed at achieving a coordinated and balanced transportation system. In addition, an RTP identifies the region's transportation needs; sets forth actions, programs, and a plan of projects to address the needs consistent with adopted regional strategies and goals; and documents the financial resources needed to implement the RTP. The process for development of the RTP takes into account all modes of transportation and is accompanied by a continuing, cooperative, and comprehensive planning approach that is also performance driven and outcome based, consistent with the provisions of MAP-21, FAST Act and Infrastructure Investment and Jobs Act.

The RTP must also comply with Section 65080 of the California Government Code. The State requirements largely mirror the federal requirements and require each transportation planning agency in urban areas to adopt and submit an updated RTP to the California Transportation Commission (CTC) and the California Department of Transportation (Caltrans) every 4 years. To ensure a degree of statewide consistency in the development of RTPs, the CTC adopted RTP Guidelines pursuant to Government Code Section 14522. The RTP Guidelines include a requirement for program-level performance measures, which include objective criteria that reflect the goals and objectives of the RTP. The RTP Guidelines are intended to assist MPOs and RTPAs with developing RTPs that are consistent with federal and State planning requirements. An RTP is used to guide the development of the Federal Transportation Improvement Program, a federally mandated 4-year program of all regionally important surface transportation projects and all projects that will receive federal funding, as well as other transportation programming documents and plans. The proposed plan follows the 2024 RTP Guidelines, which were adopted on January 26, 2024.

SUSTAINABLE COMMUNITIES STRATEGY REQUIREMENTS

Pursuant to the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the SCS is a required component of the RTP. SB 375 directs CARB to set regional targets for reducing GHG emissions. SB 375 requires that an MPO prepare and adopt an SCS that sets forth a forecasted regional development pattern that reduces GHG emissions associated with the land use and transportation network, measures, and policies. SB 375 is part of California's overall strategy to reach GHG emissions reduction goals as set forth by Assembly Bill 32, SB 32, AB 1279 and Executive Order B-30-15. According to Section 65080(b)(2)(B) of the California Government Code, the SCS must:

- identify existing land uses,
- identify areas to house long-term population growth,
- identify areas to accommodate an 8-year projection of regional housing needs,
- identify transportation needs and the planned transportation network,
- consider resource areas and farmland,
- consider State housing goals and objectives,
- set forth an integrated forecasted development pattern and transportation network that will reduce GHG emissions, and
- comply with federal Clean Air Act requirements for developing an RTP.

As stated above, ABAG, the Council of Governments for the Bay Area, generally focuses on regional land use, housing, environmental quality, and economic development. MTC functions under State and federal law as the RTPA and MPO and generally focuses on transportation planning, distribution of federal transportation funding, and air quality conformity.[1] SB 375 recognizes the bifurcated roles of each agency. Under California Government Code Section 65080(b)(2)(C), ABAG is responsible for the following portions of the SCS, which address housing policy:

- Identify the general location of uses, residential densities, and building intensities within the region.
- Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the RTP, taking into account net migration into the region, population growth, household formation, and employment growth.
- Identify areas within the region sufficient to house an 8-year projection of the regional housing need for the region pursuant to Section 65584.
- Gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in subdivisions (a) and (b) of Section 65080.01.
- Consider the State housing goals specified in Sections 65580 and 65581.

MTC is responsible for the following portions of the SCS, which address transportation:

- Identify a transportation network to service the transportation needs of the region.
- Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 US Code Section 7506).

Both agencies are jointly responsible for the following portion of the SCS:

- Set forth a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, will reduce the GHG emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the GHG emission reduction targets approved by the California Air Resources Board.

SB 375 requires the designated transportation planning agency (MTC) to "prepare and adopt" both the RTP and the SCS (California Government Code Section 65080[a], [b][2][B], and [b][2][H]).

1.7.4 2013 Settlement Agreement

Shortly after adoption of the first Plan Bay Area and certification of the EIR in July 2013, four lawsuits were filed challenging those actions based on CEQA and other California laws. Two of the lawsuits were fully litigated with final trial court judgments in favor of MTC and ABAG, affirmed by the court of appeal. The other two were settled out of court, including the lawsuit filed by the Building Industry Association (BIA) of the Bay Area. The BIA agreement required ongoing obligations on the part of MTC and ABAG in preparing future updates of Plan Bay Area, as set forth in more detail in **Table 1-1**.

[1] In addition to functioning as the RTPA and MPO MTC functions as the Bay Area Toll Authority, Bay Area Housing Finance Authority, and Service Authority for Freeways and Expressways for the nine county Bay Area.

Table 1-1: Building Industry Association Settlement Agreement Components and Compliance Information

Agreement Paragraph	Agency Obligation	Timing	Where Addressed	Compliance Completed
6a.	**Regional Housing Control Total and Forecasted Development Pattern**. The SCS shall set forth a forecasted development pattern for the region that includes the Regional Housing Control Total, which shall have no increase in in-commuters over the baseline year for the SCS.	Regional Housing Control Total must be determined and disclosed prior to issuance of a Notice of Preparation for the SCS/RTP EIR, or if no EIR is prepared, then at least 6 months before a draft SCS is released for public review.	The agencies shall use the adopted methodology for determining the Regional Housing Control Total in the final Plan Bay Area SCS.	Yes. For Plan Bay Area 2050+, the Regional Housing Control Total was determined using the same, adopted Regional Growth Forecast methodology originally approved by ABAG in September 2019 for Plan Bay Area 2050. This methodology was carried forward and used to prepare the updated Regional Growth Forecast for Plan Bay Area 2050+. The updated forecast was shared publicly in draft form in November 2023, and has been referenced throughout the update process, including as part of the Final Blueprint Approval Resolution in January 2025. While the updated forecast was not formally approved as a stand-alone item (as was done in the previous planning cycle), it was disclosed on multiple occasions and incorporated into the Plan Bay Area 2050+ Final Blueprint, thus fulfilling the requirement to determine and disclose the Regional Housing Control Total prior to release of the NOP and the draft SCS.
6b.	**Validation**. The agencies shall implement robust monitoring of regional development patterns, at a minimum tracking building permit issuance, number of units in PDAs, and type of residential development.	Monitoring would be done prior to release of the SCS.	The results shall inform each update of the Plan Bay Area SCS.	Yes. For Plan Bay Area 2050+, MTC-ABAG tracked residential permitting activity in both PDA and non-PDA areas and presented this information at a public meeting in May 2024. This monitoring fulfilled the requirement to validate regional development patterns before the SCS was made available for public review. (https://mtc.legistar.com/LegislationDetail.aspx?ID=6658399&GUID=82B81AFC-BDDA-46F6-BAC4-4CE62D002180&Options=&Search=). In addition, MTC-ABAG continues to track housing growth through its Vital Signs regional monitoring initiative, which provides ongoing data on

Agreement Paragraph	Agency Obligation	Timing	Where Addressed	Compliance Completed
				housing permits and development trends across the Bay Area. Together, these efforts demonstrate compliance with the validation obligation and ensure that updated development patterns informed the Plan Bay Area 2050+ process. (https://vitalsigns.mtc.ca.gov/indicators/housing-permits)
6c.	**Feasibility Analysis**. The agencies shall prepare an update to the PDA Feasibility Analysis to include analysis of local land use policies, market demand, financial feasibility, site-related issues, financing, and infrastructure needs.	The update shall be published prior to issuance of a Notice of Preparation for the SCS/RTP EIR or, if no EIR is prepared, then at least 6 months before a draft SCS is released for public review.	The results of the analysis shall inform each update of the Plan Bay Area SCS.	Yes. MTC-ABAG fulfilled this obligation as part of the Plan Bay Area 2050 development process. The results of updated PDA feasibility analysis informed Plan Bay Area 2050 and continue to inform the update process for Plan Bay Area 2050+.
6d.	**Assumptions and Disclosure**. The agencies shall disclose and accept public comments on the key assumptions and descriptors to be used in preparation of each SCS update.	Key assumptions shall be disclosed prior to preparation of a document comparable to the Initial Vision Scenario, setting forth development scenarios, or if no such document is prepared, assumptions shall be disclosed at least 6 months prior to public release of a draft SCS. Key descriptors shall be disclosed with release of the SCS.	Appropriate assumptions and descriptors are to be used in preparation of the final Plan Bay Area SCS.	Yes. For Plan Bay Area 2050+, the disclosure of key assumptions built on the Regional Growth Forecast methodology originally adopted by ABAG in September 2019 for Plan Bay Area 2050. That methodology was carried forward to develop the updated Regional Growth Forecast for Plan Bay Area 2050+, which was disclosed publicly in draft form in November 2023 and incorporated into the Final Blueprint Approval Resolution in January 2025. For Plan Bay Area 2050+, the Blueprint strategies and related land use modeling assumptions were refined through multiple stages of engagement and disclosure. Staff began public and partner engagement in summer 2023 to inform revisions, and the Joint MTC Planning Committee and ABAG Administrative Committee approved the revised Draft Blueprint strategies and Growth Geographies in January 2024.

Agreement Paragraph	Agency Obligation	Timing	Where Addressed	Compliance Completed
				The performance outcomes of the Draft Blueprint were released in June 2024, followed by additional engagement in summer 2024 to support further refinements. The Final Blueprint strategies were approved by the MTC Commission and ABAG Executive Board in January 2025, with updated performance outcomes shared in June 2025. These steps ensured that both the Regional Growth Forecast and the Blueprint strategies were disclosed with sufficient opportunity for public comment prior to release of the draft SCS.

Notes: PDA=priority development area.

1.7.5 Plan Development Process

The proposed plan—Plan Bay Area 2050+—serves as the 2025 RTP/SCS and builds upon the previous strategies developed in the first three iterations of Plan Bay Area, discussed below.

The proposed plan development process was composed of several key phases:

- **Kickoff and Engagement** (summer 2023 and summer 2024): Staff determined that the plan would be a limited and focused update leveraging the solid foundation of Plan Bay Area 2050, including its adopted vision and guiding principles.
- **Draft Blueprint** (summer 2023 to spring 2024): Refining strategies from Plan Bay Area 2050, the Draft Blueprint served as a "first draft" of the proposed plan. Refinements reflected implementation progress, the post-pandemic planning context, and insights gathered during the first round of public engagement in summer 2023.
- **Final Blueprint** (summer 2024 to spring 2025): Building on the Draft Blueprint, the Final Blueprint refined and expanded strategies (35 in total) to make further progress on the five key challenges identified in the Draft Blueprint analysis while integrating robust public feedback received during the second round of public engagement in summer 2024.

KICKOFF AND ENGAGEMENT

Beginning in summer 2023, MTC and ABAG kicked off the update to the plan and began the first round of public engagement including pop-ups, workshops, webinars, and an online survey. Engagement aimed to gather insights on the pandemic's impact on Bay Area residents and sought to identify shifts in priorities and concerns among different partners and stakeholders. See Section 1.7.6 for additional information regarding public engagement. Findings from early engagement provided the Bay Area with a foundational understanding on which strategies may require adjustments for the plan.

THE BLUEPRINT

Building on the foundation of Plan Bay Area 2050, the Plan Bay Area 2050+ Blueprint integrates strategies across four elements—transportation, housing, the economy, and the environment—aimed at creating a more resilient and equitable future for the Bay Area. The Blueprint planning process was developed in two phases: the Draft and the Final Blueprint. Because the Blueprint was a key first step in creating the proposed plan, it required iteration and engagement with the public, stakeholders, and elected officials.

The Draft Blueprint

The Draft Blueprint, approved by MTC and ABAG in January 2024, included refinements to Plan Bay Area 2050 to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all residents by the year 2050. The Draft Blueprint included refinements to environment strategies focused on further reducing greenhouse gas emissions and adapting to climate change; housing and economy refinements focused on addressing pressing challenges of affordable housing, homelessness, and access to opportunity; and non-transit transportation strategies focused on expanding pricing and promoting active transportation and safety.

As a result of the rapid changes in commute patterns brought about by the CVOID-19 pandemic, as well as significant reductions in anticipated transit revenues through 2050 the plan includes a comprehensive update of the six transit related strategies. The updated strategies will be finalized into a Transit 2050+ network concept that has been incorporated into the plan. Transit 2050+ is a parallel long-range planning effort with the Bay Area transit agencies responsible for updating the six strategies to create a more comprehensive transit network.

The plan has been designed to accommodate 1 million new households and 1.4 million new jobs between 2020 and 2050 identified in the regional growth forecast, described in more detail in Section 2.3, “Planning Assumptions.” The Draft Blueprint included a fiscally constrained revenue forecast from the needs and revenue assessments, also described in more detail in Section 2.3, as well as new regional revenues for transportation, housing, economy, and environmental resilience. See MTC’s webpage, https://planbayarea.org/plan-bay-area-2050-plus-blueprint, for more information.

The Final Blueprint

The package of Draft Blueprint strategies was revised based on a second round of robust engagement with Bay Area residents and stakeholders to increase the effectiveness of strategies in realizing the vision and guiding principles of the proposed plan. The Final Blueprint included additional strategy refinements for transportation, housing, economy, and environment elements. In January 2025, MTC and ABAG approved the Final Blueprint, which includes a set of 35 revised strategies, as well as the Growth Geographies, described in Section 2.2, “Proposed Plan.” The Final Blueprint was advanced by MTC and ABAG in January 2025 as the proposed plan for analysis in the EIR, following the completion of modeling and analysis. See MTC’s webpage, https://planbayarea.org/plan-bay-area-2050-plus-blueprint, for more information.

1.7.6 Public Engagement

MTC and ABAG conducted the first round of public engagement for the plan in summer and early fall of 2023 to gather insight on the pandemic’s impact on the lives of Bay Area residents. Engagement also sought to identify shifts in priorities and concerns among different partners and stakeholders. Activities included pop-up workshops, an online survey, and partner/stakeholder virtual workshops. Through the first round of engagement MTC and ABAG received over 16,000 public comments and engaged hundreds of stakeholders. The input helped staff prioritize and refine the strategies that were then incorporated into the Draft Blueprint.

In summer 2024, MTC and ABAG began the second round of engagement, which focused on sharing the outcomes from the Draft Blueprint analysis, seeking feedback on the challenges identified in the Draft Blueprint, and identifying early implementation priorities to inform the development of the plan. The reach of the plan's engagement was expanded by conducting a more robust variety of activities that focused on reaching specific communities, in addition to reaching the general public. Expanded engagement efforts included reaching out to farmworkers, Native American residents, and rural communities. Over 50 events were held regionwide to gain feedback. Engagement activities included an online survey, 26 pop-up workshops, 21 discussion groups, six presentations to community groups, one workshop hosted by a community-based organization, two technical workshops, and one webinar. Over 13,800 residents and partners participated in engagement activities that were conducted in summer 2024. Key themes that emerged from the second round of engagement included transit improvements, housing and land use, and roads and tolling.

1.8 FUTURE ENVIRONMENTAL REVIEW

Implementation of the projects addressed in the proposed plan must individually demonstrate compliance with the requirements of CEQA and/or NEPA (for projects requiring federal funding or approvals). As appropriate, individual projects may be required to prepare a project-level analysis to fulfill CEQA and/or NEPA requirements. The lead agency responsible for reviewing these projects shall determine the level of review needed, and the scope of that analysis will depend on the specifics of the particular project. These projects may, however, use the discussion of impacts in this program EIR as a basis of their assessment of these regional or cumulative impacts. These projects may also be eligible for CEQA streamlining under SB 375, as explained further below.

This program EIR is a first-tier document that addresses the environmental impacts that may affect the nine-county Bay Area as a result of adoption and implementation of Plan Bay Area 2050+. "Tiering" generally refers to using the analysis of a broader environmental document that covers the general impacts of a program or larger-scale project so that subsequent environmental documents for a related individual project can be narrow and focused on unique or unanalyzed issues. CEQA encourages the use of tiering to reduce the time and excessive paperwork involved in the review process by eliminating repetitive analyses of issues that were addressed in the program EIR (CEQA Guidelines Section 15168). SB 375 enables certain qualifying projects to tier off the SCS or alternative planning strategy developed to meet California's climate change goals. Tiered documents may consist of initial studies or focused EIRs that may incorporate by reference portions of the program EIR from which they are tiered. If the potential environmental effects of subsequent actions are consistent with and adequately addressed by a certified program EIR, additional environmental analysis may be unnecessary.

1.9 CEQA STREAMLINING OPPORTUNITIES

Following certification of this EIR and adoption of Plan Bay Area 2050+ by MTC and ABAG, CARB must then confirm that the plan will achieve the GHG emission reduction targets required by Assembly Bill 32 and SB 375. After this determination is made, a number of streamlining benefits become available to lead agencies that carry out or approve future projects consistent with the plan.

For a lead agency to take advantage of the potential streamlining benefits associated with the SCS, the lead agency must comply with all feasible and applicable mitigation measures included in this EIR, to the extent necessary, to substantially lessen or avoid potentially significant impacts of the project. Where a future project, as mitigated by the lead agency, would not result in a potentially significant impact identified in this

EIR, the lead agency is not required to adopt the mitigation measures set forth in this EIR and/or other relevant project-level EIRs to take advantage of the CEQA streamlining benefits discussed below.

1.9.1 Streamlining Under SB 375

SB 375 provides streamlining benefits for transit priority projects (TPPs). A TPP is a project that meets all the following criteria:

- consistent with the general land use designation, density, building intensity, and applicable policies specified for the project area in the SCS;
- located within half a mile of a major transit stop or high-quality transit corridor;
- composed of at least 50% residential use based on total building square footage and if 26–50% of total building square footage is nonresidential, a minimum floor area ratio of 0.75); and
- built out with a minimum of 20 dwelling units per acre (Public Resources Code [PRC] Section 21155).

For the purposes of this EIR, geographic areas that meet the TPP requirements are referred to as Transit Priority Areas (TPAs).

One of three potential streamlining benefits may apply to a TPP pursuant to SB 375, as described below and in **Table 1-2**.

First, TPPs that meet a detailed list of criteria set forth in PRC Section 21155.1 are statutorily exempt from CEQA. Because the list of criteria that must be met to achieve this exemption is extensive, the exemption may be available only in limited circumstances.

Second, a TPP that does not qualify for the statutory exemption may be eligible to comply with CEQA using a Sustainable Communities Environmental Assessment (SCEA). An SCEA is similar to a streamlined negative declaration or mitigated negative declaration and requires a 30-day public review period. An SCEA is available for a TPP that would not result in any potentially significant environmental impacts after mitigation and that has incorporated all feasible mitigation measures, performance standards, or criteria set forth in the prior applicable EIRs, including the EIR for the RTP/SCS. An SCEA is not required to discuss (1) growth-inducing impacts or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on climate change or the regional transportation network (PRC Sections 21155.2[b][1], 21159.28[a]). In addition, unlike a negative declaration or mitigated negative declaration, a lead agency's decision to approve a TPP based on an SCEA is reviewed, if challenged, by a court under the substantial evidence standard (PRC Section 21155.2[b][7]).

Third, a TPP that would result in one or more potentially significant impacts after mitigation may be reviewed using a tiered TPP EIR as established by PRC Section 21155.2(c). A tiered TPP EIR is required to address only the significant or potentially significant effects of the TPP on the environment. It is not required to include a discussion of (1) growth-inducing impacts, (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, (3) cumulative effects that have been adequately addressed and mitigated in prior applicable certified EIRs, (4) off-site alternatives, or (5) a reduced-density alternative to address effects of car and light truck trips generated by the TPP (PRC Sections 21155.2[c], 21159.28[a] and [b]).

In addition to the benefits provided for TPPs, SB 375 provides streamlining benefits for residential or mixed-use residential projects, as defined in PRC Section 21159.28(d), that are consistent with the use designation, density, building intensity, and applicable policies specified for the project area in the SCS. Projects eligible for streamlining must incorporate mitigation measures required by an applicable prior

environmental document, such as this EIR if it is certified by MTC and ABAG. EIRs for qualifying residential or mixed-use residential projects are not required to include a discussion of (1) growth-inducing impacts, (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, or (3) a reduced-density alternative to address effects of car and light truck trips generated by the project (PRC Section 21159.28[a] and [b]).

Table 1-2 lists the prerequisites and qualifications for residential/mixed-use residential projects, TPPs, and sustainable communities projects and the corresponding CEQA streamlining benefits under SB 375. Projects that use the SB 375 CEQA streamlining benefits would still need to obtain discretionary permits or other approvals from the lead agency and the local jurisdiction, in accordance with local codes and procedures, including any agreements related to zoning, design review, use permits, and other local code requirements. Other development projects that do not fall into any of these categories could still use this EIR for other CEQA tiering benefits. For more information, see Section 1.9.4, "Other Tiering Opportunities."

Table 1-2: SB 375 Requirements for CEQA Streamlining Related to an SCS

Project Designation	Mixed-Use Residential Project	Transit Priority Project	Sustainable Communities Project
Prerequisites	◢ MPO adopts an SCS or APS that can achieve region's GHG emissions reduction target ◢ CARB accepts the SCS or APS ◢ Proposed project is a residential or residential mixed-use project consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in the SCS or APS ◢ Project has incorporated applicable mitigation measures or performance standards required by a prior environmental document ◢ Regardless of any CEQA streamlining or exemption benefits that a project receives from the SB 375 CEQA provisions, the lead agency must consider the merits of the project before moving forward with project approvals in accordance with local codes and procedures	◢ MPO adopts an SCS or APS that can achieve region's GHG emissions reduction target ◢ CARB accepts the SCS or APS ◢ Proposed project is a residential or residential mixed-use project consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in the SCS or APS ◢ Project has incorporated applicable mitigation measures or performance standards required by a prior environmental document ◢ Regardless of any CEQA streamlining or exemption benefits that a project receives from the SB 375 CEQA provisions, the lead agency must consider the merits of the project before moving forward with project approvals in accordance with local codes and procedures	◢ MPO adopts an SCS or APS that can achieve region's GHG emissions reduction target ◢ CARB accepts the SCS or APS ◢ Proposed project is a residential or residential mixed-use project consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in the SCS or APS ◢ Project has incorporated applicable mitigation measures or performance standards required by a prior environmental document ◢ Regardless of any CEQA streamlining or exemption benefits that a project receives from the SB 375 CEQA provisions, the lead agency must consider the merits of the project before moving forward with project approvals in accordance with local codes and procedures

Project Designation	Mixed-Use Residential Project	Transit Priority Project	Sustainable Communities Project
Qualifications	◢ At least 75% of total building square footage for residential use	◢ At least 50% of total building square footage for residential use and If 26–50% of total building square footage is nonresidential, a minimum FAR of 0.75; ◢ Minimum net density of 20 du/acre; and ◢ Within 0.5 mile of major transit stop or high-quality transit corridor included in the RTP	◢ Everything for Transit Priority Project PLUS: ◢ Served by existing utilities ◢ Applicant pays all applicable fees ◢ Does not contain wetlands or riparian areas ◢ Does not have significant value as a wildlife habitat and does not harm any protected species ◢ Not on the Cortese List ◢ No risks from hazardous substances ◢ No impacts on historic resources ◢ No wildfire, seismic, flood, or public health risk ◢ Not on developed open space ◢ Buildings are 15% more energy efficient than required under Title 24 ◢ Landscaping uses 25% less water than average households ◢ Site is no more than 8 acres ◢ No more than 200 housing units ◢ No net loss of affordable housing within project area ◢ No building greater than 75,000 square feet ◢ Does not conflict with nearby industrial uses ◢ Meets minimum affordable housing requirements as prescribed in SB 375 OR in-lieu fee paid OR 5 acres of open space per 1,000 residents provided
Streamlining Benefits	Environmental documents are **not** required to reference, describe, or discuss: ◢ Growth-inducing impacts ◢ Impacts from car and light-duty truck trips on global warming or	The lead agency may determine whether to pursue a Sustainable Communities Environmental Assessment (SCEA): ◢ Lead agency prepares only an initial study that identifies all significant	Exempt from CEQA Lead agency may file a notice of exemption upon project approval.

Project Designation	Mixed-Use Residential Project	Transit Priority Project	Sustainable Communities Project
	◢ the regional transportation network ◢ A reduced-density alternative to project (EIRs only) ◢ Cumulative effects that have been adequately addressed and mitigated in prior applicable certified EIRs ◢ Off-site alternatives	impacts, except for growth-inducing impacts and impacts from car and light-duty truck trips on global warming or the regional transportation network ◢ Cumulative effects identified and mitigated for in previous applicable EIRs shall NOT be treated as cumulatively considerable for the project ◢ Shall contain mitigation measures to avoid or mitigate to a level of less than significant all significant effects identified ◢ 30-day public comment period ◢ May be approved after the lead agency conducts a public hearing, reviews comments received, and finds that all potentially significant effects have been identified, analyzed, and mitigated to a level of less than significant ◢ The fee to appeal a planning commission decision to the decision-making body shall not exceed $500 ◢ Deferential review standard—the burden of proof for legal challenge is on the petitioner/plaintiff	

Source: California Public Resources Code, Division 13, Chapter 4.2 (Implementation of the Sustainable Communities Strategy), Section 21155.

1.9.2 Streamlining Under SB 226

In 2011, the legislature enacted SB 226 to establish additional streamlining benefits applicable to infill projects that are consistent with the requirements set forth in CEQA Guidelines Section 15183.3 (PRC Sections 21094.5[c], 21094.5.5). Residential, commercial and retail, public office buildings, transit stations, and schools are eligible for this streamlining provided they meet the following requirements: (1) are located in an urban area on a site that has been previously developed or adjoins existing qualified urban uses on at least 75% of the site's perimeter; (2) satisfy the performance standards provided in Appendix M of the CEQA Guidelines; and (3) are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either an SCS or an alternative

planning strategy, with some exceptions. For these projects, an "infill EIR" is required to analyze only effects on the environment that are specific to the project or to the project site and that were not addressed as significant effects in a prior planning-level EIR unless new information shows the effects would be more significant than described in the prior EIR (PRC Section 21094.5[a][1]). Moreover, an infill EIR is not required to consider potentially significant environmental effects of the project that would be reduced to a less-than-significant level by applying uniformly applicable development policies or standards adopted by the city, county, or the lead agency (PRC Section 21094.5[a][2]). The infill EIR is not required to discuss (1) alternative locations, project densities, or building intensities or (2) growth-inducing impacts.

Unlike the CEQA streamlining benefits established by SB 375 which are limited to residential projects, the benefits created by SB 226 may apply to nonresidential projects, including qualifying commercial, retail, transit station, school, or public office building projects (CEQA Guidelines Section 15183.3[f][1]).

1.9.3 Streamlining Under SB 743

SB 743 (2013) (PRC Sections 21099 and 21155.4) created an exemption from CEQA for certain projects that are consistent with a specific plan. (See PRC Section 21155.4.) A specific plan is a local plan that contains specific policies and development regulations for a defined area, such as a downtown core or along a transit corridor. The exemption applies if a project meets all of the following criteria:

- It is a residential, employment center, or mixed-use project.
- It is located within a TPA.
- The project is consistent with a specific plan for which an EIR was certified.
- It is consistent with an adopted SCS or alternative planning strategy.

The exemption cannot be applied if the project would cause new or worse significant environmental impacts compared to those analyzed in the EIR for the specific plan. In that case, supplemental environmental review must be conducted.

SB 743 also specifies that aesthetic and parking impacts of residential, mixed-use residential, or employment center uses on infill sites within a TPA shall not be considered significant effects on the environment (see PRC Section 21099[d]).

1.9.4 Other Tiering Opportunities

Finally, for all other types of projects proposed to be carried out or approved by a lead agency within the region, the lead agency may use this EIR for the purposes of other allowed CEQA tiering (PRC Sections 21068.5, 21093–21094; CEQA Guidelines 15152, 15385). Moreover, by tiering from this EIR (if certified by MTC and ABAG), a later tiered EIR would not be required to examine effects that (1) were mitigated or avoided in this EIR; (2) were examined in this EIR at a level of detail sufficient to allow those effects to be mitigated or avoided by site-specific revisions, the imposition of conditions, or other means in connection with the approval of the later project; or (3) constitute cumulative effects and that were adequately addressed in this EIR (PRC Section 21094).

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2 PROJECT DESCRIPTION

2.1 INTRODUCTION

The proposed project is a long-range regional plan for the nine-county San Francisco Bay Area (Bay Area or region), encompassing transportation, housing, economic, and environmental strategies designed to make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. Known as Plan Bay Area 2050+, referred to herein as the "proposed plan," it serves as th foe region's 2025 RTP/SCS.

An RTP, also sometimes referred to as a Metropolitan Transportation Plan or Long-Range Transportation Plan, is the mechanism used in California by both Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) to conduct required long-range (minimum 20-year) planning for the region's multimodal transportation system. The SCS is a land use plan for the region that, in combination with the RTP, would accommodate future regional growth for all economic segments of the population while achieving State greenhouse gas (GHG) emissions reduction targets if implemented.

The draft plan, supplementary reports, and other technical documents on the planning process can be found at the Plan Bay Area 2050+ website: planbayarea.org/draftplan.

This chapter describes the proposed plan and the project objectives and includes a discussion on planning assumptions and the plan's strategies and resulting forecasted changes.

2.2 PROPOSED PLAN

The most recent RTP/SCS for the Bay Area—Plan Bay Area 2050—was adopted in 2021. As the Bay Area's third RTP to include an SCS, the 2021 plan was considered a "major" update of Plan Bay Area 2040, adopted in 2017, as it accompanied a concurrent Regional Housing Needs Allocation (RHNA) cycle. The proposed plan serves as the fourth RTP/SCS for the Bay Area and is a limited and focused update to Plan Bay Area 2050 and does not accompany a RHNA cycle. The proposed plan continues the framework of Plan Bay Area 2050 and focuses on four interrelated elements— transportation, housing, the economy and the environment. The proposed plan is composed of 35 integrated strategies across the four elements that provide a blueprint for how the Bay Area can accommodate future growth and make the region more equitable and resilient and achieve regional GHG emissions reduction targets established by the California Air Resources Board (CARB) pursuant to SB 375. Strategies in the context of the proposed plan are defined as either a public policy or a set of investments that can be implemented in the Bay Area through the year 2050. A strategy is not a near-term action, a mandate for a jurisdiction or agency, or a legislative proposal.

The proposed plan's 12 transportation strategies build upon the region's long-standing commitment to a "fix-it-first" strategy to maintain and optimize the existing transportation system and establish project and program priorities that allow project sponsors to qualify for federal funding for public transit, streets and roads, and bicycle and pedestrian facilities. Undergirding the transportation strategies is the fiscally constrained transportation project list, constrained by expected transportation revenues is fundamental to the RTP and required per federal and State regulations.

The proposed plan's 14 housing and economic strategies detail how the region can accommodate the region's forecasted growth in population, households, housing units, and jobs within the region (see Section 2.3.1, "Regional Growth Forecast") and shape the ensuing forecasted development pattern. These land use strategies, together with designated Growth Geographies, work in tandem to focus housing and job growth into existing communities that are well served by the transportation network—especially those with strong transit access—as well as in communities with well-resourced schools and easy access to jobs, parks, and other amenities. This approach for leveraging the plan's strategies is known as the "focused growth" approach. The key to implementing the "focused growth" approach is the locally nominated Growth Geographies, including Priority Development Areas (PDAs), Priority Production Areas (PPAs). The full suite of Growth Geographies are explained in more detail in Section 2.3.4, "Proposed Plan Growth Geographies," in this chapter and depicted in **Figure 2-5**.

The proposed plan's nine environmental strategies promote conservation, adaptation, and climate resilience, including a specific strategy (EN1, "Adapt to Sea Level Rise,") to protect shoreline communities affected by sea level rise by preparing a resilience project list (see Section 2.2.2, "Proposed Plan Strategies"). As part of the proposed plan, the resilience project list includes adaptation projects for regularly inundated shoreline areas. The sea level rise adaptation projects are described below under Section 2.2.2.

In summary, the proposed plan:

- details transportation and environmental strategies to invest $512 billion in expected transportation revenues from federal, State, regional, and local sources over the next 25 years (totals below may not sum due to rounding);
- details housing and economic strategies ("land use") to invest $746 billion in expected revenues to accommodate 1.8 million new residents, 1 million new households, 1.5 million new forecasted housing units, and 1.4 million new jobs between 2020 and 2050;
- details environmental strategies to invest $229 billion in expected revenues to protect the region from 4.9 feet of inundation from both permanent sea level rise as well as temporary inundation from king tides and storms, reduce climate emissions, and maintain and expand the region's parks and open space system; and
- complies with Senate Bill (SB) 375, the State's SCS law, which requires integration of land use and transportation planning to reduce per-capita passenger vehicle GHG emissions by 2035 and provide adequate housing for all economic segments of the region's forecast of 1.8 million new residents and 1 million new households between 2020 and 2050.

The proposed plan area covers the entire Bay Area, which includes the nine counties and the 101 cities that make up the region. The proposed plan is constrained by expected transportation revenues and the forecasted population and job growth discussed in Section 2.3, "Planning Assumptions." The proposed plan includes a fiscally constrained Transportation Project List outlining projects and programs eligible for future federal and State funding, but it does not allocate funds to any specific project or program. Additionally, the proposed plan includes a list of locally developed sea level rise adaptation projects, as well as placeholder projects, collectively referred to as the Resilience Project List. The proposed plan does not change local land use policies; individual jurisdictions retain all local land use authority. The proposed plan facilitates subsequent streamlined CEQA analysis pursuant to SB 375, SB 743, and other methods described in Section 1.9, "CEQA Streamlining Opportunities," in Chapter 1, "Introduction."

2.2.1 Project Objectives

The proposed plan's adopted vision is to ensure the Bay Area is affordable, connected, diverse, healthy, and vibrant for all by the year 2050. To support this vision, MTC and ABAG developed guiding principles and performance measures in conjunction with members of the public, partners, and elected officials. In addition, SB 375 mandates two performance targets related to housing all economic segments of the population and reducing per-capita GHG emissions from cars and light-duty trucks. Together, the guiding principles and performance metrics serve as the basis for the following CEQA objectives:

1. Address climate change by reducing carbon dioxide (CO_2) emissions pursuant to targets established by the California Air Resources Board (CARB); specifically, meet or exceed a 19% reduction in per-capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels.
2. House 100% of the region's projected growth by income level, and with no increase in in-commuters over the proposed plan baseline year.
3. Ensure that all current and future Bay Area residents and workers have sufficient housing options they can afford by reducing how much residents spend on housing and transportation and by producing and preserving more affordable housing.
4. Support an expanded, well-functioning, safe and multimodal transportation system that connects the Bay Area by improving access to destinations and by ensuring residents and workers have a transportation system they can rely on.
5. Support an inclusive region where people from all backgrounds, abilities, and ages can remain in place with full access to the region's assets and resources by creating more inclusive communities and reducing the risk that Bay Area residents are displaced.
6. Conserve the region's natural resources, open space, clean water, and clean air with the intent of improving health of Bay Area residents and workers and improving the health of the environment locally and globally.
7. Support the creation of quality job opportunities for all and ample fiscal resources for communities by enabling the Bay Area economy to thrive and supporting the recovery of the region's downtowns from the pandemic.

2.2.2 Proposed Plan Strategies

Plan Bay Area 2050+ is defined by four **elements**: transportation, housing, the economy, and the environment. Within each, there are two or three central **themes** (totaling 11 across the entire plan) under which several **strategies** (totaling 35 across the entire plan) are nested. Equity and resilience—the cross-cutting themes of the plan—are integrated into each element, theme, and strategy. As part of the Implementation Plan currently under development, MTC and ABAG are identifying one or more **implementation actions** for each strategy. Whereas the strategies described below are envisioned to be implemented over the next 25 years by local, regional, or State government, the Implementation Plan specifies MTC's and ABAG's role in advancing each strategy through specific implementation actions through the year 2030.

The strategies detailed below are the proposed plan's 35 integrated strategies that will enable the Bay Area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges, such as the uncertainties posed by rising sea levels, economic cycles, and new technologies.

TRANSPORTATION

The proposed plan's 12 transportation strategies detail how the region intends to dedicate $500 billion of the plan's total $512 billion in expected transportation revenues to investments in transportation strategies over the next 25 years. These transportation strategies have been refined as part of Transit 2050+, an integrated, parallel long-range planning effort to Plan Bay Area 2050+ that will develop a first-of-its-kind plan to re-envision the future of the public transit network in the nine-county Bay Area. The transportation strategies continue the region's long-standing commitment to a "fix-it-first" strategy to maintain and optimize the existing transportation system. Additionally, the transportation strategies are designed to create healthy and safe streets for pedestrians, cyclists, car drivers, and transit users and to build a next-generation transit network that is coordinated, consistent, and convenient across the region.

The strategies were selected to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all and to exceed the State-mandated target for GHG emissions reductions. This is generally accomplished by the strategies' ability to increase travel mode choices and accessibility while reducing travel times and costs.

Maintain and Optimize the Existing System | $419 Billion | 84%

Over 80% of the proposed plan's forecasted transportation revenues assigned to the Transportation Element are reinvested in maintaining and optimizing the existing transportation network. Approximately two-thirds of the anticipated funding is dedicated to preserving the condition of roadways, bridges, and transit systems, while continuing to operate 2023 levels of transit service and supporting a systemwide transition to zero-emission transit vehicles (Strategy T1). To improve the rider experience, the proposed plan includes regionwide initiatives such as a simplified, integrated fare system, unified transit signage, and enhanced paratransit coordination—particularly benefiting low-income riders and those with limited mobility (Strategy T2). The proposed plan also prioritizes seamless transfers by improving schedule coordination and upgrading facilities at 15 major transit hubs to make inter-agency transfers easier and faster (Strategy T3). In response to public feedback, the proposed plan introduces new investments to enhance safety and cleanliness on transit through improved lighting, increased staffing, and visible security and custodial presence (Strategy T4).

To manage congestion and reduce vehicle miles traveled, the proposed plan proposes a comprehensive set of user-based pricing strategies. These include peak-period, distance-based tolling on all Bay Area highways—with equity-focused features such as discounts for low-income drivers and monthly toll caps (Strategy T5). Net revenues from these strategies would be reinvested into improved transit services and corridor enhancements. In addition, the proposed plan calls for modernizing interchanges and improving traffic flow through advanced technologies like ramp metering and dynamic signage, while avoiding general-purpose lane expansions (Strategy T6). Select freeway widenings will be pursued to address chronic congestion in targeted corridors, mainly through high occupancy toll lanes, coupled with vehicle miles traveled mitigation strategies to reduce long-term impacts (Strategy T7). Finally, the proposed plan continues to support regional programs such as 511 traveler information, local planning grants, as well as transportation investments in Equity Priority Communities (Strategy T8).

Below are the proposed plan strategies to maintain and optimize the Bay Area's existing transportation system:

- **T1. Operate and Maintain the Existing System | $380 Billion |** Commit to operate and maintain the Bay Area's roads and transit infrastructure while transitioning to zero-emission transit vehicles.
- **T2. Improve the Rider Experience through Transit Network Integration | $6 Billion |** Deliver regionwide efforts to improve the rider experience, including an integrated fare structure, unified mapping and wayfinding, and improved paratransit services.

- **T3. Improve the Rider Experience through Refined Transfer Timing at Key Regional Hubs | $1 Billion |** Deliver regionwide efforts to improve the coordination of inter-agency schedules, refine transfer timing at key regional hubs, and upgrade facilities to encourage easier transfers.
- **T4. Enhance Security Measures and Improve Safety and Cleanliness on Transit | $4 Billion |** Improve infrastructure and operations around safety, personal security, and cleanliness in the transit environment.
- **T5. Implement Pricing Strategies to Manage Demand | $5 Billion |** Implement a series of usage-based pricing strategies to ease traffic, reduce vehicle mileage, and support climate goals; reinvest fees and charges towards corridor and transit improvements.
- **T6. Modernize Freeways and Interchanges | $7 Billion |** Implement projects designed to improve the quality of existing freeway assets by rebuilding interchanges and implementing advanced technologies.
- **T7. Expand Freeways and Mitigate Impacts | $4 Billion |** Implement a targeted set of freeway widenings to reduce bottlenecks, while supporting complementary actions to mitigate VMT impacts.
- **T8. Advance Other Regional Programs and Local Priorities | $12 Billion |** Fund regional programs like motorist aid and 511 while supporting local transportation investments on arterials, local streets, and in Equity Priority Communities.

Create Healthy and Safe Streets | $11 Billion | 2%

The second major theme of the transportation strategies is the creation of healthy and safe streets. Active modes are particularly important for local trips like shopping at nearby businesses and for recreation, as well as for accessing transit for longer-distance trips. Active transportation benefits both public health, through increased physical activity, and the environment, through zero-emissions travel.

Below are the proposed plan strategies to create healthy and safe Bay Area streets (totals below may not sum due to rounding):

- **T9. Build a Complete Streets Network | $9 Billion |** Enhance streets, paths, and trails to promote walking, biking, and rolling through sidewalk improvements, car-free slow streets, and All Ages and Abilities Active Transportation Network.
- **T10. Advance Regional Vision Zero Policy through Street Design and Reduced Speeds | $1 Billion |** Implement street design elements on local streets and automated speed enforcement on freeways to reduce speed limits to 20–35 miles per hour on local streets, especially those within the High Injury Network, and to 55 miles per hour on freeways.

Build a Next Generation Transit Network | $71 Billion | 14%

The proposed plan invests over $70 billion to improve and expand transit across the Bay Area. More than $40 billion is dedicated to increasing the frequency, reliability, and capacity of existing transit services, helping reduce wait times and travel delays, especially for riders in Equity Priority Communities (Strategy T11). These upgrades include better transit signal timing, new grade separations, and other enhancements that make buses and trains faster and more dependable.

To serve areas that currently lack strong transit connections, the proposed plan sets aside $28 billion to expand the regional transit network and reach new communities (Strategy T12). These investments aim to connect growing neighborhoods and job centers with high-quality transit, encouraging more people to choose transit over driving. Together, these strategies lay the groundwork for a more connected, accessible, and competitive transit system throughout the region.

Below are the proposed plan strategies to build the Bay Area's next generation transit network (totals below may not sum due to rounding):

- **T11. Enhance Transit Frequency, Capacity and Reliability | $44 Billion |** Improve the quality and availability of existing transit services, including improvements for equity priority populations.
- **T12. Expand Transit Services throughout the Region | $28 Billion |** Better connect communities by strategically expanding transit services to new markets and previously unserved or underserved areas, including the addition of new infrastructure.

HOUSING

The proposed plan's eight housing strategies detail how the region can accommodate the region's forecasted 1.5 million new housing units between 2020 and 2050. The housing strategies continue the region's commitment to "focused growth" but also are intended to protect current residents from displacement, preserve existing affordable housing, and produce new housing to secure long-term affordability to address the Bay Area's housing crisis (the "three Ps").

The strategies were selected to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all, and to exceed the State-mandated target for GHG emissions reductions. This is generally accomplished by some of the strategies' ability to shape the region's forecasted development pattern and focus new housing in TRAs and HRAs.

Protect and Preserve Affordable Housing | $252 Billion | 51%

The depth of the Bay Area's housing crisis is so great that it is unlikely that increased housing construction alone will be sufficient to ensure every Bay Area resident has access to a safe and affordable home. Protecting and preserving existing affordable housing is critical to advancing the proposed plan's vision for a more affordable region. Policies and investments that ensure current affordable market rate housing is not converted into unaffordable housing due to market pressures are a key component. Additionally, action will be needed to reverse the decades-long trend of displacement—affecting both renters and owners in the Bay Area—including legal protections and prohibition of exploitative landlord behaviors.

Final Blueprint strategies expand upon existing measures to increase housing security for renters, including tenant support services, enforcement of tenant legal protections, and limits on rent increase that exempt new construction. Furthermore, the Final Blueprint includes an investment to ensure that today's affordable housing remains affordable into the future.

Below are the proposed plan strategies to protect and preserve affordable housing:

- **H1. Strengthen Renter Protections | $2 Billion |** Expand measures to increase housing security for renters, including tenant support services, enforcement of tenant legal protections, and limits on rent increases that exempt new construction.
- **H2. Preserve Existing Affordable Housing | $250 Billion |** Acquire homes currently affordable to low- and middle-income residents for preservation as permanently deed-restricted affordable housing, including opportunities for resident ownership.

Spur Housing Production for People of All Income Levels | $236 Billion | 47%

The third prong of the three Ps (protection, preservation, and production) framework is to produce more housing at every affordability level. The Bay Area has historically fallen short of producing housing for all income levels, particularly for low- and moderate-income households. Many factors feed into this lagging production, including overly restrictive zoning that places a cap on the number of new units that can be built on a site, rising construction costs and land values, a long permitting process for units of all

affordability levels, and a lack of financing and subsidies for homes affordable to households with low- and moderate incomes.

Spurring housing production at all income levels will likely require a mix of land use reforms, new requirements for housing developers, and financial incentives to make it more financially viable to produce housing affordable to low- and moderate-Income families. The proposed plan includes strategies for each of these areas, implemented regionwide to ensure that the region produces enough housing to accommodate all future population growth, as required by law.

Below are the proposed plan strategies to spur housing production at all income levels:

- **H3. Allow a Greater Mix of Housing Densities and Types in Growth Geographies | <$1 Billion[1] |** Allow a mix of housing types at a range of densities and in a variety of building configurations to be built in Priority Development Areas, select High-Resource Areas, and select Transit-Rich Areas, including areas where the Transit-Oriented Communities Policy applies, augmented by streamlined review and reduced parking requirements for affordable homes, as well as building code updates.
- **H4. Build Adequate Affordable Housing to Ensure Homes for All | $236 Billion |** Construct enough deed-restricted affordable homes to fill the existing gap in housing for the unhoused community and to meet the needs of low-income households; provide easy-to-access funding for projects that leverage public or discounted private land, utilize streamlined entitlement, commit to efficient design and delivery measures; support a greater variety of building types, construction technologies and ownership models.
- **H5. Integrate Affordable Housing into All Major Housing Projects | <$1 Billion |** Require a baseline of 10–20% of new market-rate housing developments of five units or more to be affordable to low-income households.
- **H6. Transform Aging Malls and Office Parks into Neighborhoods | <$1 Billion |** Permit and promote the reuse of shopping malls and office parks with limited commercial viability as neighborhoods with housing for residents at all income levels, including locally-designated Priority Sites.

Create Inclusive Communities | $11 Billion | 2%

In addition to strategies related to housing supply and stability, an additional suite of strategies would promote inclusive communities where different types of people can work, live, and interact together. These new housing strategies would provide targeted mortgage, rental, and small business assistance to communities with low incomes and communities of color. Additionally, these strategies would accelerate the reuse of public and community-owned land for mixed-income housing.

Below are the proposed plan strategies to create inclusive communities:

- **H7. Provide Targeted Mortgage, Rental, and Small Business Assistance to Equity Priority Communities |** $11 Billion | Provide assistance to low-income communities and communities of color to address the legacy of exclusion and predatory lending, while helping to grow locally owned businesses.
- **H8. Accelerate Reuse of Public and Community-Owned Land for Mixed-Income Housing and Essential Services |** <$1 Billion | Help public agencies, community land trusts and other nonprofit landowners accelerate development of 100% affordable and mixed-income housing, supportive services, and public spaces, including on locally-designated Priority Sites; offer easy-to-access funding to projects that commit to streamlined entitlement and innovative design and delivery.

[1] Several strategies would require incremental increases in public administrative costs to implement. In these cases, the strategy cost is shown as <$1 billion.

ECONOMY

The proposed plan's six economic strategies detail how the region can accommodate the region's forecasted 1.4 million new jobs between 2020 and 2050. The economic strategies continue the region's commitment to "focused growth," concentrating development of new employment centers within the existing urban development footprint ("developed" land) and close to housing and transit stations.

The strategies were selected to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all, and to exceed the State-mandated target for GHG emissions reductions. This is generally accomplished by the strategies' ability to shape the regional forecasted development pattern and focus new jobs in TRAs and PPAs.

Improve Economic Mobility | $221 Billion | 90%

As the types of jobs available to Bay Area residents continue to shift, fewer and fewer middle-wage jobs become available. Over the past few decades, the traditional path to middle class through a blue-collar industry like manufacturing has become ever more elusive as automation grows and wages sharply diverge. Over the same period, the cost of living in the Bay Area has risen substantially, buoyed by a self-reinforcing cycle of higher-wage job growth and rising housing costs.

A stronger safety net, coupled with a concerted effort to open more pathways to middle-wage jobs, is critical to ensuring that no one is priced out of the Bay Area. Improving economic mobility is a complex undertaking beyond MTC's and ABAG's jurisdictional sphere that will require a coordinated, multipronged approach, as well as further growing key partnerships.

Below are the proposed plan strategies to improve economic mobility:

- **EC1. Implement a Statewide Guaranteed Income | $205 Billion |** Provide an income-based payment to all Bay Area households to improve family stability, promote economic mobility, and increase consumer spending.
- **EC2. Expand Job Training and Incubator Programs | $5 Billion |** Establish job training and business incubation hubs in Transit-Rich Areas easily accessible to residents of Equity Priority Communities, focusing on areas co-located with jobs in key sectors that are served by major regional transit investments, including Key Regional Hubs.
- **EC3. Invest in High-Speed Internet in Underserved Low-Income Communities | $11 Billion |** Provide direct subsidies and construct public infrastructure to ensure all communities have affordable access to high-speed internet.

Shift the Location of Jobs | $25 Billion | 10%

The Bay Area must also address its imbalance of the location of jobs in order to support continued economic growth. The plan encourages more jobs and economic activity in traditional downtowns and long-standing industrial areas through proposed strategies. These strategies focus on locating jobs in places that strengthen the region's economy while prioritizing access to public transit.

Below are the proposed plan strategies to shift the location of jobs:

- **EC4. Allow a Greater Mix of Land Use and Densities in Growth Geographies | <$1 Billion** | Allow greater mix of commercial, civic, cultural, and other active land uses in select PDAs and select TRAs to revitalize downtowns and main streets, and to support transit recovery.

- **EC5. Provide Incentives to Employers to Locate in Low-VMT Areas | $20 Billion |** Provide targeted investments and incentives to encourage employers that offer middle-wage, in-person jobs to locate in low-VMT areas, prioritizing those that are transit-rich and/or housing-rich, including Key Regional Hubs.
- **EC6. Retain and Invest in Key Industrial Lands | $5 Billion |** Implement local land use policies to protect key industrial lands, identified as PPAs, while funding key infrastructure improvements in these areas.

ENVIRONMENT

The proposed plan's nine environmental strategies promote conservation, adaptation, and climate mitigation. Strategies that fall under the three themes of reducing risks from hazards, expanding access to parks and open space, and reducing climate emissions are crucial to ensuring that the Bay Area is environmentally—and equitably—thriving in 2050.

The strategies were selected to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all, and to exceed the State-mandated target for GHG emissions reductions. This is generally accomplished by the strategies' ability to protect from sea level rise, shape the region's forecasted development pattern and focus growth (housing and jobs) away from hazards and the region's periphery, and reduce GHG emissions.

Reduce Risks from Hazards | $157 Billion | 69%

By 2050, according to many climate scientists, major U.S. cities, including San Francisco, will have unprecedented weather events. Wildfires that destroy hundreds of homes in a single night are becoming an annual occurrence, sea level is rising, and traffic is currently routinely rerouted on several low-lying roads because of flooding from heavy rains. The threat of a major earthquake has always existed in the Bay Area, and with the last major seismic event in the region occurring in 1989 with the Loma Prieta earthquake, the region will at some point see another major event, based on scientific forecasts.

There is considerable uncertainty as to how natural hazards will shape life in the Bay Area over the next 25 years and beyond. The proposed plan takes these risks into account, discouraging growth in high-risk wildfire areas; planning to protect homes, businesses, and transportation infrastructure from flooding; and considering avenues to minimize damage from a major earthquake. Assistance is needed to support conversion of structures to address these natural hazards, including decarbonization and water supply Proposed strategies would work together to protect existing agriculture and natural lands and enhance urban parks and open space to provide urban green spaces to minimize hazardous effects. These urban green spaces would provide urban greening in communities reducing heat island effects and warming.

Below are the proposed plan strategies to reduce risks from hazards:

- **EN1. Adapt to Sea Level Rise | $96 Billion |** Adapt shoreline communities, infrastructure, and ecosystems affected by sea level rise.
- **EN2. Provide Means-Based Financial Support for Seismic, Wildfire, and Accessibility Home Retrofit | $9 Billion |** Adopt building ordinances and incentivize retrofits to existing buildings to meet higher seismic, wildfire, and ADA accessibility standards, providing means-based subsidies to offset associated costs.
- EN3. Provide Means-Based Financial Support for Energy Decarbonization and Water Efficiency Upgrades in All Buildings | $52 Billion | Provide financial support to reduce barriers to the conversion of Bay Area buildings to electric, energy efficient, and water efficient properties.

Expand Access to Parks and Open Space | $62 Billion | 27%

The proposed plan's environmental strategies chart the course for a future Bay Area where development is focused within the existing urban development footprint, ringed by natural lands that are well-maintained and dotted with parks and trails that provide easy access to open space, regardless of where a person lives. Support for locally adopted land use policies that limit new construction outside of the existing footprint, combined with investments in natural lands that serve vital ecological purposes and parks and recreation facilities essential to population health and well-being are packaged together to advance this vision, with a specific emphasis on improving access to parks and open space and promoting a sustainable development pattern.

Below are the proposed plan strategies to expand access to parks and open space:

- **EN4. Maintain Urban Growth Boundaries | <$1 Billion |** Use urban growth boundaries to focus new development within the existing urban footprint or areas otherwise suitable for growth, as established by local jurisdictions.
- **EN5. Protect and Manage High-Value Conservation Lands | $35 Billion |** Protect and preserve high-priority natural and working lands improving the resilience and connectivity of the region's biodiversity and the sustainability and vibrance of the agricultural sector.
- **EN6. Expand Urban Greening in Communities | $27 Billion |** Invest in quality parks, trails, tree canopy, and urban greening, providing recreation opportunities for people from all backgrounds, abilities, and ages to enjoy.

Reduce Climate Emissions | $10 Billion | 4%

The importance of addressing climate change in the face of ever-worsening climate events like fires, drought, extreme heat, and flooding calls for a swift and sustained reduction in GHG emissions across multiple sectors. SB 375, a State mandate to reduce GHG emissions from passenger vehicles, codified this importance in 2008, calling on regions across the State to work together toward the goal of reducing global warming and combating climate change.

Strategies recognize that action is needed at a variety of scales and on different timelines. Climate strategies in the plan include clean vehicle initiatives to help people purchase and power more environmentally friendly cars; transportation demand management initiatives to encourage Bay Area residents to drive less; and incentives for employers to expand commute trip reduction programs to encourage their workers to drive less Together, these strategies reduce the Bay Area's climate emissions, exceeding State-mandated targets without sacrificing equitable outcomes.

While many proposed plan strategies across the transportation, housing, and economy chapters help to reduce climate emissions, below are the proposed plan strategies to reduce climate emissions included in the environment chapter:

- **EN7. Expand Commute Trip Reduction Programs at Major Employers | <$1 Billion** | Set a sustainable commute target for major employers as part of an expanded Bay Area Commuter Benefits Program, with employers responsible for funding incentives and disincentives to shift auto commuters to any combination of working from-home, transit, walking, and/or bicycling.
- **EN8. Expand Clean Vehicle Initiatives | $8 Billion |** Expand investments in clean vehicles, including electric vehicles and electric mobility options, and charging infrastructure subsidies, to accelerate the transition from conventional vehicles.
- **EN9. Expand Transportation Demand Management Initiatives | $2 Billion |** Expand investments in transportation demand management programs to reduce driving demand and encourage active and shared transportation choices, such as vanpools, bikeshare, carshare, and transit.

2.2.3 Conditions Under the Proposed Plan

This section details outcomes of implementation of the proposed plan's 35 integrated strategies.

LAND USE DEVELOPMENT

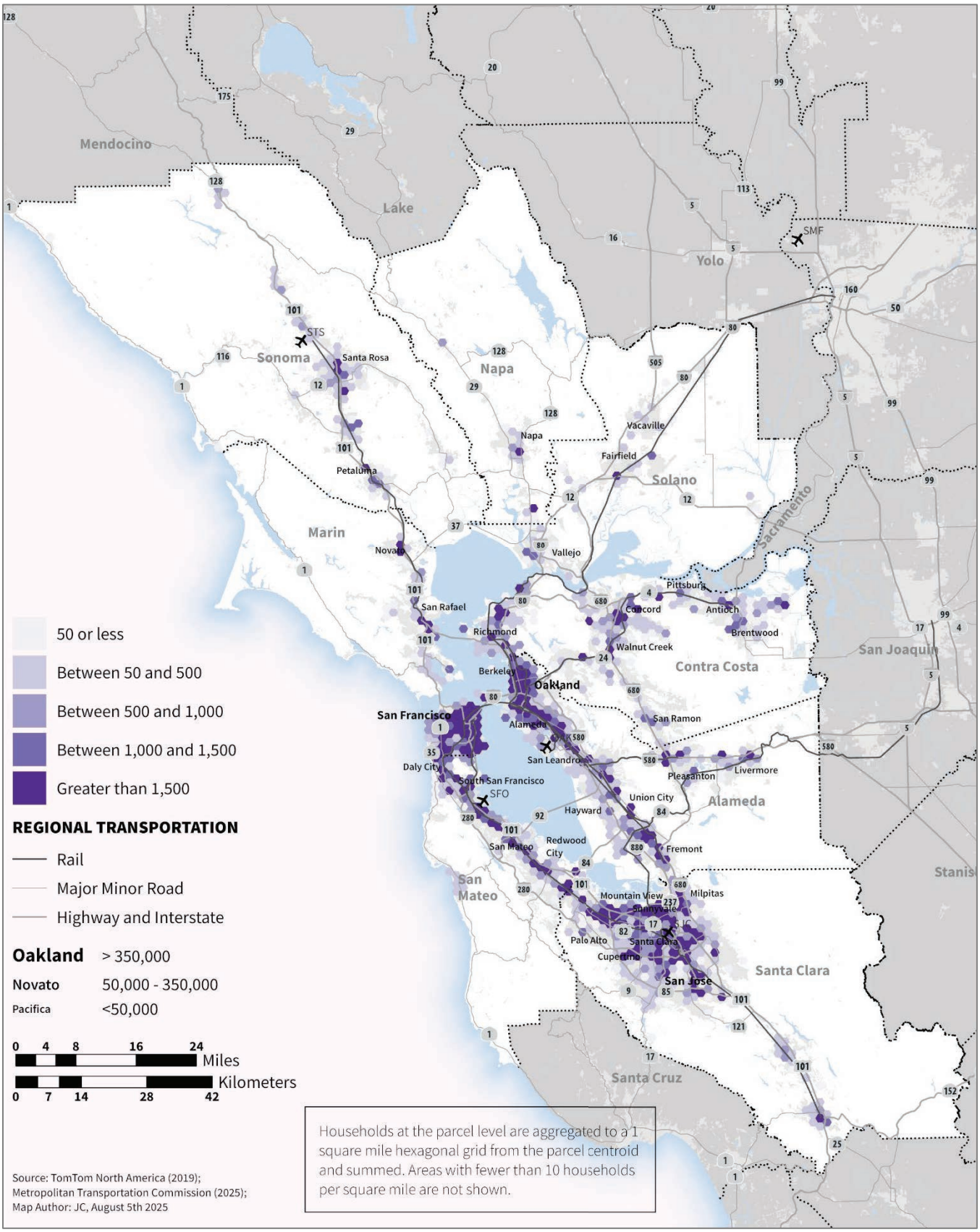
Building upon past iterations of Plan Bay Area, the proposed plan's approach for leveraging strategies remains "focused growth" in existing communities along the existing transportation network with strong transit access, as well as communities with well-resourced schools and easy access to jobs, parks, and other amenities. This approach helps to achieve the region's vision by building upon established community characteristics and leveraging existing infrastructure while reducing effects on areas with less development. To plan for future growth and meet the GHG emissions reduction target established by CARB pursuant to SB 375, the proposed plan designates specific geographic areas—known as Growth Geographies (see Section 2.3.4, "Proposed Plan Growth Geographies")—as areas prioritized to accommodate the regional growth forecast (see Section 2.3.1, "Regional Growth Forecast").

The proposed plan prioritizes these designated Growth Geographies to accommodate most of the regional growth forecast by applying a series of land use strategies (a subset of the housing, economic, and environmental strategies discussed in Section 2.2.2, "Proposed Plan Strategies") to these select geographies to make individual parcels of land more attractive for both development and redevelopment. The proposed plan uses the Growth Geographies and land use strategies to influence the forecasted development pattern by affecting the location, use, intensity, and density of forecasted development. Many of the land use strategies are aimed at achieving the proposed plan's approach to focused growth to comply with SB 375's GHG emissions reduction mandate, whereas other land use strategies are aimed at the affordability of the region's housing to take on SB 375's other mandate to ensure that a mix of housing types are available to households of all income types across the region. While the proposed plan prioritizes growth in Growth Geographies, it still allows for development outside these areas, consistent with local land use policies.

The proposed plan's forecasted development pattern, also referred to as the "land use growth footprint," represents the development or redevelopment of parcels of land simulated to accommodate the region's forecasted growth of households and jobs from 2020 through 2050 through the development of new building(s). The forecasted development pattern is a result of existing zoning and other land use policies, the regional growth forecast, and the proposed plan's Growth Geographies and 35 integrated strategies. The forecasted development pattern (land use growth footprint) is simulated from the Bay Area UrbanSim 2.0 land use model (see Section 2.3.3, "Analysis Tools") by forecasting future land use changes (e.g., development or redevelopment) in 5-year increments starting from base year conditions.

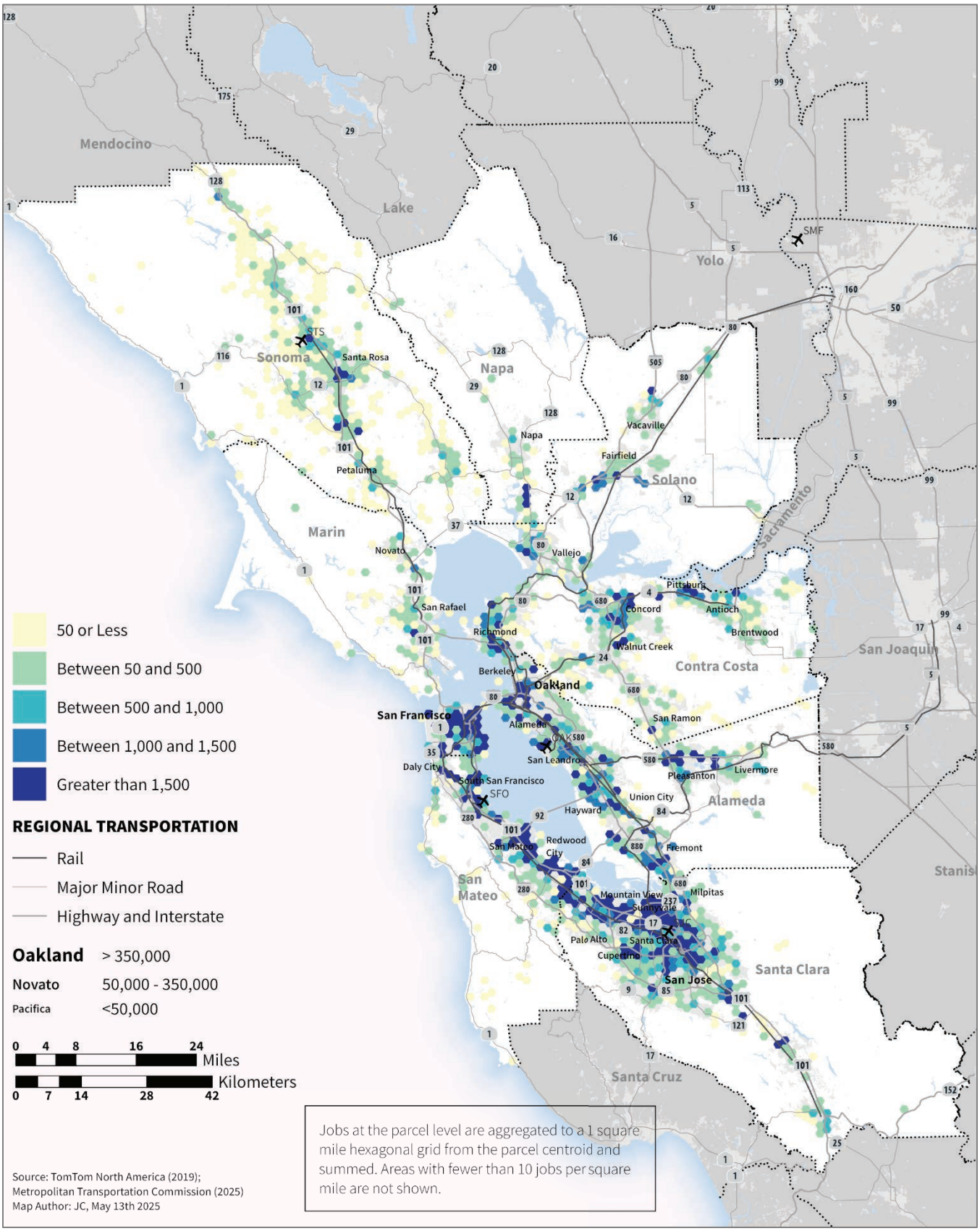
Table 2-1 shows the projected pattern of household and job growth from 2020 to 2050. Overall, the region's development pattern in 2050 shifts slightly as compared to 2020. Santa Clara County (South Bay) is expected to experience significant growth—45% in households and 50% in employment—resulting in a larger share of the region's total households and employment. The South Bay's share in households and employment would increase, while the North Bay (Marin, Napa, Solano, and Sonoma Counties) would experience a decline in its share of both households and employment. The East Bay (Alameda and Contra Costa Counties) would retain its share of households but would experience a slight decrease in its share of employment. In contrast, the West Bay (San Mateo and San Francisco Counties) would gain a larger share of both households and employment. **Figures 2-1** and **2-2** on the following pages illustrate the general location and intensity of projected household and job growth.

Figure 2-1: Change in Households, 2020 through 2050



Source: TomTom North America 2019; MTC 2025.

Figure 2-2: Change in Employment, 2020 through 2050



Source: TomTom North America 2019; MTC 2025.

Table 2-1: Forecasted Household and Employment Growth, 2020-2050, by County

County	Households			Employment		
	Base Year, 2020	Proposed Plan, 2050	Change, 2020 to 2050	Base Year, 2020	Proposed Plan, 2050	Change, 2020 to 2050
Alameda	588,800	840,500	251,700	410,800	526,100	115,300
Contra Costa	396,500	492,000	95,500	127,300	126,300	-970
Marin	108,700	130,900	22,200	67,600	72,400	4,800
Napa	50,500	56,200	5,700	710,700	959,500	248,800
San Francisco	385,600	578,600	193,000	397,400	592,800	195,400
San Mateo	286,700	394,300	107,600	1,079,700	1,620,200	540,500
Santa Clara	646,100	934,600	288,500	128,400	159,600	31,200
Solano	142,600	152,900	10,300	215,900	268,200	52,300
Sonoma	186,100	214,000	27,900	410,800	526,100	115,300
Regional Total	2,792,000	3,794,000	1,002,000	4,023,000	5,434,000	1,410,000

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The land use growth footprint can include both new development and redevelopment sites. As shown in **Table 2-2**, the land use growth footprint covers approximately 34,600 acres of land in the Bay Area. The proposed plan's approach to focused growth results in less than 1% of the region's total land area being affected by the land use growth footprint. While the greatest growth in households and employment is forecasted to occur in Santa Clara County, as reflected in **Table 2-1**, the county anticipated to have the greatest amount of land acres affected by growth is Alameda County, followed by Contra Costa, Santa Clara, Solano, San Francisco, San Mateo, Sonoma, Marin, and Napa Counties.

Table 2-2: Land Use Growth Footprint by County and Growth Geography Designation

County	Acres	Within Designated Plan Bay Area 2050+ Growth Geography					
		Priority Development Area (acres)	Priority Production Area (acres)	High-Resource Area (acres)	High-Resource Area and Transit-Rich Area (acres)	Transit-Rich Area (acres)	Subtotal (acres)
Alameda	8,500	3,500	2,000	70	430	740	6,700
Contra Costa	7,700	2,100	1,200	240	100	470	4,100
Marin	910	260	0	70	170	130	630
Napa	870	90	380	0	0	0	470
San Francisco	2,800	2,300	200	0	100	100	2,700
San Mateo	2,400	1,000	6	100	410	370	1,900
Santa Clara	7,140	3,300	320	400	1,200	650	5,900
Solano	2,800	730	1,600	0	0	20	2,400
Sonoma	1,500	560	20	0	1	110	690
Regional Total	34,600	13,800	5,700	880	2,400	2,600	25,400

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 2-2 also details that approximately 74% (25,400 acres out of approximately 34,600 acres) of the land use growth footprint would be in one of the proposed plan's designated Growth Geographies, described in Section 2.3.4, "Proposed Plan Growth Geographies." Growth in PDAs, one of the proposed plan's designated Growth Geography classifications, represents 40% of the land use growth footprint, followed by growth in PPAs, TRAs, and HRAs.

Urbanization—growth on land not designated as urban built-up land as defined by California's Department of Conservation through the Farmland Mapping and Monitoring Program (FMMP)—is forecasted to occur on approximately 8,080 acres, or of the land use growth footprint (**Table 2-3**). The remaining 78% of the land use growth footprint would be within land designated as urban built-up—which FMMP defines as "land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel"—reflective of the proposed plan's core focused growth approach to leverage existing infrastructure. The greatest amount of urbanization is forecasted to occur in Contra Costa County (approximately 4,100 acres), followed by Solano and Alameda Counties. Regionally, the share of land forecasted to be urban built-up in 2050 (18%) is the same as the observed conditions in 2022 (18%).

Table 2-3: Acreages of Urban Built-Up Land by County, Region, and TPA

County	Total Land (acres)	2022 Urban Built-Up (acres)	2022 Urban Built-Up (%)	Forecasted Development on Land not Designated as Urban Built-Up (acres)	Proposed Plan 2050 Potential Urban Built-Up (acres)	Proposed Plan 2050 Potential Urban Built-Up (%)
Alameda	472,000	148,200	31%	770	149,000	32%
Contra Costa	458,800	149,100	32%	4,100	153,200	33%
Marin	332,900	41,200	12%	130	41,400	12%
Napa	481,300	24,400	5%	430	24,800	5%
San Francisco	29,900	29,900	100%	0	29,900	100%
San Mateo	287,100	74,200	26%	40	74,300	26%
Santa Clara	826,300	190,400	23%	580	191,000	23%
Solano	525,900	58,100	11%	1,600	59,700	11%
Sonoma	1,008,000	76,500	8%	430	77,000	8%
Regional total	4,422,000	792,000	18%	8,100	800,300	18%

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Sources: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025; based on 2022 data from California Department of Conservation.

SEA LEVEL RISE ADAPTATION PROJECTS

The proposed plan has integrated the issue of sea level rise inundation and identifies a strategy to adapt the shoreline of the San Francisco Bay. Strategy EN1, "Adapt to Sea Level Rise," protects shoreline communities affected by up to 4.9 feet of sea level rise inundation by identifying a series of sea level rise adaptation projects (see Section 2.2.2, "Proposed Plan Strategies") reflected in the Sea Level Rise Resilience Project List.

The plan's sea level rise adaptation projects build on local and regional planning efforts, incorporating a range of actions to mitigate inundation and storm surge impacts. These actions include elevating roadways and rail infrastructure to maintain connectivity while allowing for ecosystem linkages beneath, constructing levees—both traditional and horizontal—to provide flood protection and support wetland migration, and implementing seawalls in highly developed areas to limit erosion and flooding. Tidal gates regulate tidal flows and storm surges in critical waterways, while marsh restoration efforts enhance natural flood resilience and restore wetland habitat. Together the area to support these projects makes up the sea level rise adaptation projects footprint. For more details on these adaptation strategies, refer to the Plan Bay Area 2050+ Technical Assumptions supplemental report.

See **Table 2-4** and **Figure 2-3** for a summary of the following sea level rise adaptation projects footprint.

Table 2-4: Sea Level Rise Adaptation Projects Footprint by County

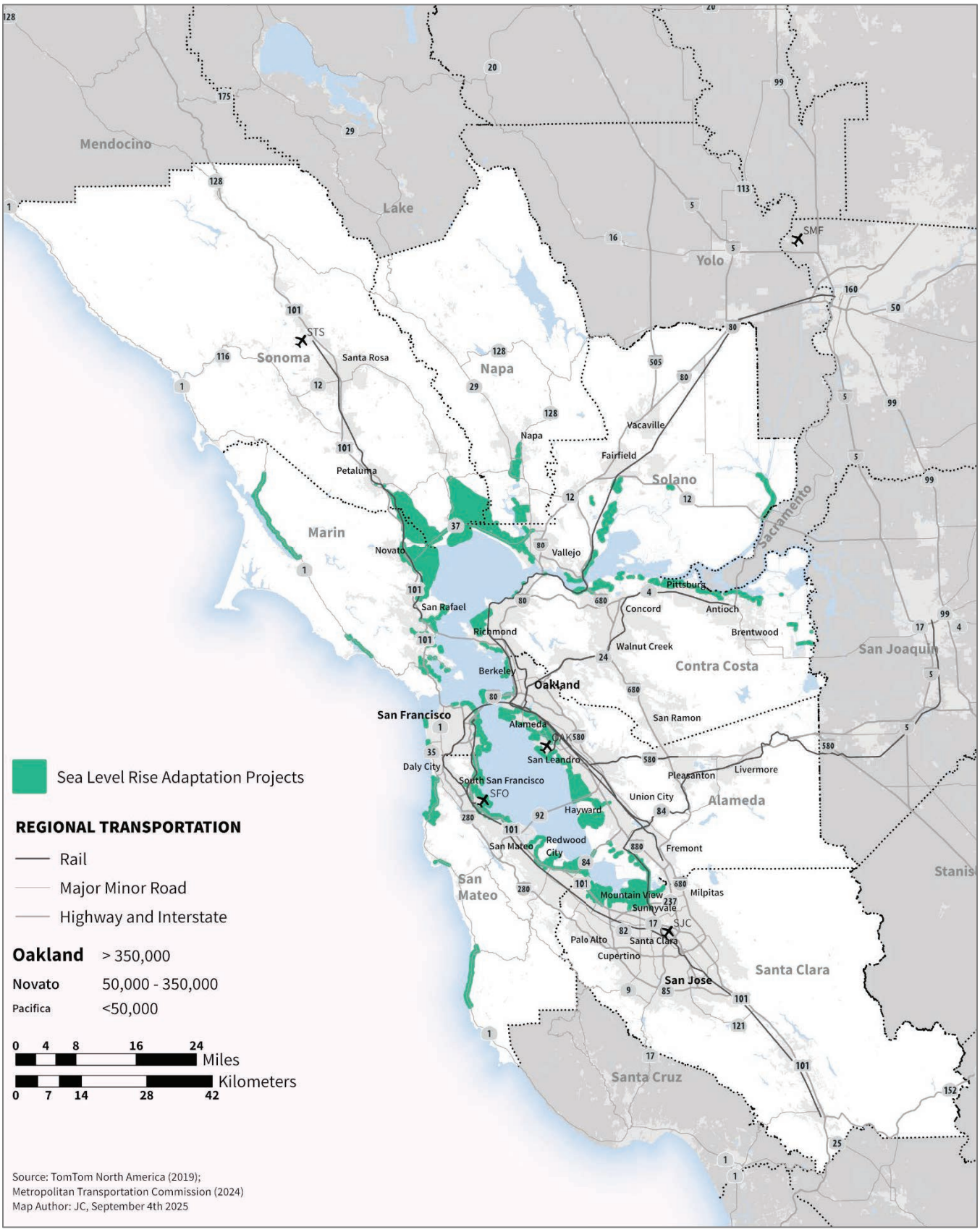
County	Acres
Alameda	8,700
Contra Costa	5,200
Marin	16,600
Napa	4,000
San Francisco	2,000
San Mateo	8,800
Santa Clara	6,400
Solano	7,400
Sonoma	25,000
Regional Total	84,100

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The footprint of sea level rise adaptation projects were spatially analyzed using known or approximate site plans for and the preliminary design information for individual projects. The proposed plan's sea level rise adaptation projects footprint was developed from the proposed sea level rise adaptation projects. See Section 3.1, "Approach to the Analysis," for more discussion on the development of the sea level rise adaptation projects footprint. As shown in **Table 2-4**, the total footprint associated with sea level rise adaptation projects is approximately 84,100 acres.

While the plan has incorporated sea level rise adaptation projects as a plan component, it is important to note the effects of the environment on a project are generally outside the scope of CEQA unless the project would exacerbate these conditions, as concluded by the California Supreme Court (see *California Building Industry Association v. Bay Area Air Quality Management District* [2015] 62 Cal.4th 369, 377 ["we conclude that agencies generally subject to CEQA are not required to analyze the impact of existing environmental conditions on a project's future users or residents. But when a project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users."]). Changes to the State CEQA Guidelines to reflect this decision were adopted on December 28, 2018. Accordingly, while the proposed plan contains elements that would reduce the effects of sea level rise, the EIR analysis generally does not address the impacts of existing environmental conditions on a project's future users or residents. However, when a proposed project risks exacerbating environmental hazards or conditions that already exist, the EIR analyzes the potential impact of such hazards on future residents or users.

Figure 2-3: Sea Level Rise Adaptation Projects Footprint



Source: TomTom North America 2019; MTC 2024.

TRANSPORTATION SYSTEM

Projects and Programs

The transportation strategies discussed in Section 2.2.2, "Proposed Plan Strategies," generally fall into two categories: those that alter travel demand and those that alter the supply or capacity of the transportation system. Demand-side strategies, including a subset of the environmental strategies, generally require little or no capital projects and focus on policies such as user fees (e.g., tolls, parking, and transit fares) or incentives designed to influence travel behavior. Supply-side strategies may involve both capital-intensive and non-capital projects included in the proposed plan's fiscally constrained Transportation Project List, such as the addition of new travel lanes, new transit services, or improvements to transit service frequency and reliability. The Transportation Project List, constrained by expected transportation revenues discussed in Section 2.3.2, "Financial Forecasts," is required per federal and State regulations.

The Transportation Project List can be divided into two general investment categories: (1) programmatic categories, which include group listings of projects exempt from regional air quality conformity analysis, and (2) major transportation projects, which are nonexempt, capacity-increasing projects. Major transportation projects typically involve adding travel lanes to freeways, expressways, or highways, or expanding fixed-guideway transit systems such as rail, ferry, or bus rapid transit. In contrast, programmatic categories focus on investments that do not increase system capacity, such as operations and maintenance, asset replacement or preservation (e.g., pavement and transit vehicles), bicycle and pedestrian facilities, and intersection improvements. **Table 2-5** includes the proposed plan's major transportation investments. A complete list of the proposed plan's investments can be found at the Plan Bay Area 2050+ website: planbayarea.org/draftplan.

Table 2-5: Major Investments by Strategy (Greater Than $250 Million in Cost)

Strategy / System	Title	Location
T1	**Operate and Maintain the Existing System**	
Public Transit	Public Transit Service Levels	REG
Roadway	Highways	REG
Roadway	Local Bridges	REG
Roadway	Local Streets & Roads & Bicycle/Pedestrian	REG
Public Transit	Public Transit Capital Assets	REG
Roadway	Toll Bridges	REG
Roadway	Zero-Emission Fleet Transition	REG
T2	**Improve the Rider Experience through Transit Network Integration**	
Public Transit	Integrated Fare Structure	REG
Public Transit	Mapping and Wayfinding	REG
Public Transit	Paratransit Enhancements and Coordinated Services Plan Implementation	REG
T3	**Improve the Rider Experience through Refined Timing at Key Regional Hubs**	
Public Transit	Improve the Rider Experience through Refined Timing at Key Regional Hubs	REG
T4	**Enhance Security Measures and Improve Safety and Cleanliness on Transit**	
Public Transit	Enhance Security Measures and Improve Safety and Cleanliness on Transit	REG

Strategy / System	Title	Location
T5	**Implement Pricing Strategies to Manage Demand**	
Roadway	Next Generation Freeways Pricing Strategy	REG
Roadway	Congestion Pricing & Mobility Improvements | Treasure Island	SF
Roadway	Congestion Pricing & Mobility Improvements | Downtown San Francisco	SF
T6	**Modernize Freeways and Interchanges**	
Roadway	Bay Area Forward Program	REG
Roadway	Other Investments to Modernize Freeways and Interchanges	REG
Roadway	Interchange Improvements | I-80 | Yerba Buena Island	SF
Roadway	Interchange Improvements | I-80 | I-680 and SR-12, Packages 3-5	SOL
Roadway	Interchange Improvements | I-680 | SR-4, Phases 1, 2a, 4	CC
Roadway	Interchange Improvements | US- 101 | SR-84 ("Woodside Rd")	SM
Roadway	Interchange Improvements | US- 101 | Zanker Rd, Skyport Dr and N. Fourth St	SCL
T7	**Expand Freeways and Mitigate Impacts**	
Roadway	Express Lane Network Vehicle Miles Traveled (VMT) Mitigation	REG
Roadway	Other Freeway Expansion VMT Mitigation Reserve	REG
Roadway	Express Lane | HOV Conversion/New Lane | I-680 (NB) | Between Livorna Rd and Arthur Rd	CC
Roadway	Express Lanes | New Lane | US- 101 | Between I-380 and the San Francisco County Line	SM
Roadway	Express Lanes | HOV Conversion and New Lane | US-101 | Between SR-237 and South of I-880 ("Phase 5")	SCL
Roadway	Express Lanes | HOV Conversion and New Lane | US-101 | Between I-880 and SR-85 ("Phase 6")	SCL
Roadway	HOV Lane, Tolling and Express Bus | New Lane | SR-37 | Between SR- 121 and Mare Island ("Interim Project")	MRN, NAP, SOL, SON
T8	**Advance Other Regional Programs and Local Priorities**	
Other	511 Bay Area Program	REG
Other	All Electronic Tolling Program	REG
Other	Carpool/Vanpool Program	REG
Other	Motorist Aid Services Program	REG
Other	Regional Communications and Incident Management Program	REG
Other	Goods Movement Improvements	REG
Other	Other Locally Identified Improvements	REG
Other	Planning/Program	REG
Roadway	Reserve for Capital Projects	REG
Roadway	Minor Roadway Improvements	REG
Roadway	Other Principal Arterial Improvements VMT Mitigation Reserve	REG
Roadway	Roadway Widening and Extension | Quarry Lakes Pkwy | Between Paseo Padre Pkwy and SR-238 (Mission Blvd)	ALA

Strategy / System	Title	Location
T9	**Build a Complete Streets Network**	
Bike/Ped	Complete Streets Network	REG
T10	**Advance Regional Vision Zero Policy through Street Design and Reduced Speeds**	
Bike/Ped	Speed Limit Reductions Initiatives	REG
T11	**Enhance Transit Frequency, Capacity, and Reliability**	
Public Transit	Other Investments in Transit Stations, Centers, and Stops	REG
Public Transit	Other Investments to Enhance Transit Reliability, Frequency, and Capacity	REG
Public Transit	Other Investments to Enhance and Modernize Transit Facilities	REG
Public Transit	Rapid Bus | Modernization | AC Transit | E 14th St/Mission St/Fremont Blvd Between San Leandro and Warm Springs	ALA
Public Transit	Rapid Bus | Modernization | AC Transit	ALA
Public Transit	Local Bus | Service Frequency Upgrades | AC Transit | Systemwide	ALA, CC
Public Transit	Rapid Bus | Modernization | AC Transit | San Pablo Ave	ALA, CC
Public Transit	Express Bus | Service Expansion | I-680 | Between Martinez and San Jose	ALA, CC, SCL
Public Transit	Express Bus | Service Expansion | Dumbarton Bridge | Between Union City and Redwood City	ALA, SM
Public Transit	Local Bus | Service Frequency Upgrades | County Connection	CC
Public Transit	Rapid Bus | Service Expansion | Contra Costa Co | Between Antioch and Brentwood	CC
Public Transit	Ferry and Express Bus | Service Expansion | GGT	MRN, SF
Public Transit	Local Bus and Light Rail| Service Frequency Upgrades | SFMTA | Systemwide ("Muni Forward")	SF
Public Transit	Local Bus | Service Expansion | SFMTA | Southeast San Francisco	SF
Public Transit	Rapid Bus | Modernization | SamTrans | El Camino Real	SM
Public Transit	Express Bus | Modernization | VTA | SR-85	SCL
Public Transit	Local Bus | Service Frequency Upgrades | VTA | Systemwide ("Visionary Network")	SCL
Public Transit	Express Bus | Service Expansion | SolTrans	CC, SOL
Public Transit	Local Bus | Service Frequency Upgrades | Santa Rosa City Bus, Sonoma County Transit and Petaluma Transit | Sonoma County	SON
Public Transit	Express Bus | Service Expansion | SamTrans | US-101 and I-280 | Between San Mateo and San Francisco; Between San Bruno and Sunnyvale	REG
Public Transit	Local Bus | Service Frequency Upgrades | Priority Development Areas	REG
Public Transit	Ferry | Service Expansion | WETA | Berkeley-San Francisco	ALA, SF
Public Transit	Ferry | Service Frequency Upgrades | WETA	REG
Public Transit	Rail | Service Expansion | BART | Irvington Station	ALA
Public Transit	Rail | Service Expansion | Capitol Corridor | to Coast Subdivision ("South Bay Connect")	ALA
Public Transit	Rail | Service Expansion | ACE | System	ALA, SCL
Public Transit	Light Rail | Modernization | Muni Metro	SF
Public Transit	Rail | Service Frequency Upgrades | BART | System ("Core Capacity")	REG

Strategy / System	Title	Location
Public Transit	Grade Separations and Modernization	REG
Public Transit	Rail | Service Frequency Upgrades | Caltrain | Systemwide	REG
T12	**Expand Transit Service throughout the Region**	
Public Transit	Transit Studies and Project Development	REG
Public Transit	Rail | Service Expansion | Between San Joaquin County and Dublin/Pleasanton ("Valley Link")	ALA
Public Transit	Rail | Service Expansion | Caltrain/High Speed Rail | Downtown San Francisco ("Portal")	SF
Public Transit	Light Rail | Service Expansion | VTA | Eastridge	SCL
Public Transit	Rail | Service Expansion | BART | Santa Clara ("Silicon Valley Phase II")	SCL
Public Transit	Rail | Service Expansion | SMART | Healdsburg	SON
Public Transit	Rail | Service Expansion | SMART | Cloverdale	SON
EN1	**Adapt to Sea Level Rise**	
Other	Sea Level Rise Adaptation Projects	REG
EN8	**Expand Clean Vehicle Initiatives**	
Other	Clean Vehicle Initiatives	REG
EN9	**Expand Transportation Demand Management Initiatives**	
Other	Transportation Demand Management Initiatives	REG

Notes: ALA = Alameda; CC = Contra Costa; MAR = Marin; NAP = Napa; SF = San Francisco; SM = San Mateo; SCL = Santa Clara; SOL = Solano; SON = Sonoma; REG = regional.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

System Capacity

The implementation of major transportation projects, discussed above, would expand the Bay Area's transportation system capacity by adding new travel lanes and transit services. **Table 2-6** summarizes the net increase in lane-miles and transit seat miles by implementing the proposed plan.

Table 2-6: Transportation System Capacity (2023–2050)

Facility Type	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Freeway Lane Miles	5,100	5,200	130	3%
Priced Freeway Lane Mile Share	*14%*	*100%*	*86*	*614%*
Expressway Lane Miles	1,100	1,100	50	4%
Arterial Lane Miles	8,700	8,600	-80	-1%
Collector Lane Miles	5,500	5,500	10	0%
Total Roadway Lane Miles	21,000	21,100	130	1%
Daily Local Bus Seat Miles	9,177,000	12,786,000	3,609,000	39%
Daily Express Bus Seat Miles	1,457,000	2,891,000	1,434,000	98%
Daily Light Rail Seat Miles	1,922,000	3,173,000	1,251,000	65%

Facility Type	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Daily Heavy Rail Seat Miles	12,523,000	21,199,000	8,676,000	69%
Daily Commuter Rail Seat Miles	5,495,000	7,322,000	1,827,000	33%
Daily Ferry Seat Miles	852,100	2,149,000	1,297,000	152%
Total Daily Transit Seat Miles	31,425,000	49,520,000	18,096,000	58%

Notes: Freeway line mileage reflects mainline travel lanes and does not include on/off ramps. Priced freeway lane mileage include toll bridge corridors, express lanes corridors, and other usage-based pricing facilities. Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Roadway Network: The region's base year roadway network (2023 conditions) includes approximately 21,000 lane-miles, with approximately one-third classified as freeways and expressways, and two-thirds as arterials and collectors. Implementing the proposed plan would add approximately 130 lane-miles, a 1% increase over 2023 levels, with a net increase of freeway and expressway lane miles, in part due to Strategy T7, "Expand Freeways and Mitigate Impacts," which includes actions such as widening freeways to reduce bottlenecks. Lane reductions would occur primarily on arterial roadways through Bus Rapid Transit (BRT) projects, other bus-only lanes, and selective road diets.

Although freeway lane-miles will increase, Strategy T5, "Implement Pricing Strategies to Manage Demand" would result in 100% of future freeway lane-miles being part of priced facilities, including tolled freeways and toll bridges.

Public Transit Systems: Transit seat-miles, a measure of transit capacity, represent the distance transit vehicles travel multiplied by the number of seats per vehicle. In the base year (2023), the region's transit network is dominated by three modes: heavy rail, accounting for approximately 40% of total seat-miles; local bus, with 29%; and commuter rail, with 17%. Under the proposed plan, daily transit seat-miles increase by 58%, reflecting the expansion of transit services through the implementation of Strategy T11, "Enhance Transit Frequency, Capacity and Reliability" and Strategy T12, "Expand Transit Services throughout the Region."

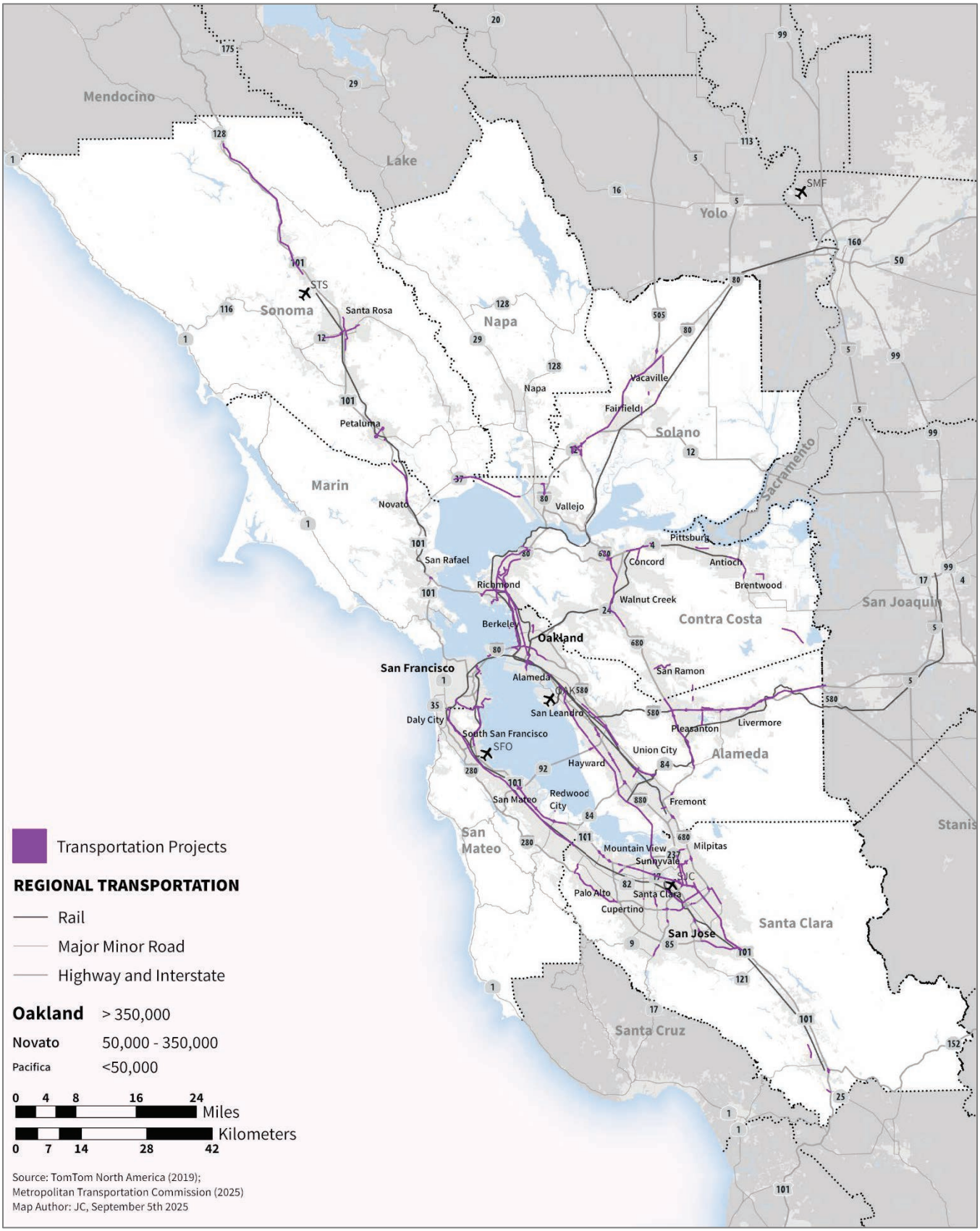
The largest absolute increases in seat-miles is heavy rail and local bus services. Heavy rail would add approximately 8.7 million seat-miles, a 69% increase from 2023 levels, while local bus service would add 3.6 million seat-miles, a 39% increase. These increases are driven by increased service on existing systems, as outlined in Strategy T11, with additional contributions from system expansion projects.

Bicycle and Pedestrian Network: A goal of the proposed plan is to enhance the region's bicycle and pedestrian network and promote growth and land use that maximize the potential for shorter trips, which are more likely to be made by nonmotorized modes. To support this goal, the proposed plan includes Strategy T9, "Build a Complete Streets Network," which would enhance streets, paths, and trails to promote walking, biking, and rolling by building out over 10,000 miles of All Ages and Abilities Complete Streets and paths, including the Bay Trail and the regional Active Transportation (AT) Network, and also includes Strategy T10, "Advance Regional Vision Zero Policy through Street Design and Reduced Speeds."

Transportation Projects Footprint

Not all of the proposed plan's transportation strategies are expected to involve earthmoving activities or have a footprint associated with implementation. The transportation projects footprint, as shown in **Figure 2-4**, includes proposed major transportation projects with the greatest potential for physical impacts, typically those that increase capacity by constructing new travel lanes on freeways, expressways, or highways or by constructing new rail, ferry, or bus rapid transit routes and stations. Projects included in the transportation projects footprint are associated with the following strategies:

Figure 2-4: Transportation Projects Footprint



Source: TomTom North America 2019; MTC 2025.

- Strategy T6, "Modernize Freeways and Interchanges";
- Strategy T7," Expand Freeways and Mitigate Impacts";
- Strategy T8, "Advance Other Regional Programs and Local Priorities";
- Strategy T11, "Enhance Transit Frequency, Capacity, and Reliability"; and
- Strategy T12, "Expand Transit Services throughout the Region."

The actual footprints and other design details of most proposed transportation projects are not known because the projects are in the early stages of planning. The proposed plan's transportation projects footprint was developed by adding buffer areas around the center line of proposed roadway and public transit projects. See Section 3.1, "Approach to the Analysis," for more discussion on the development of the transportation projects footprint. As shown in **Table 2-7**, the total footprint associated with these major transportation projects is approximately 8,500 acres. A breakdown of acreage by county is also provided in the table below.

Table 2-7: Transportation Projects Footprint by County

County	Acres
Alameda	2,700
Contra Costa	1,100
Marin	140
Napa	3
San Francisco	140
San Mateo	800
Santa Clara	1,900
Solano	880
Sonoma	760
Regional Total	8,500

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Regional Travel Forecasts

The regional growth forecast has the most significant effect on transportation trends and impacts over the plan horizon. The 1 million new households and 1.4 million new jobs forecasted between 2020 and 2050 would inevitably lead to more demand on the region's transportation systems. As previously discussed, some of the proposed plan's transportation and environmental strategies are intended to alter this demand. See Section 2.2.2, "Proposed Plan Strategies," for more detail. The MTC travel demand model, Travel Model 1.6, simulates travel forecasts for the Bay Area (see Section 2.3.3, "Analysis Tools"). Travel Model 1.6 simulates that the regional growth forecast, coupled with the proposed plan's forecasted development pattern and strategies, would lead to a shift from automobile travel to public transit and nonmotorized modes over the plan horizon (2050) in order to achieve SB 375's mandate to reduce GHG emissions.

Travel Model 1.6 is not sensitive to the full range of strategies in the proposed plan, including Strategy EN9, "Expand Travel Demand Management Strategies." Consequently, implementation of Strategy EN9 is not reflected in travel model outputs due to the modeling limitation. For limited metrics (i.e., VMT and GHG emissions) an "off-model" approach was used to quantify the effects of implementation of Strategy EN9.

Demographic Trends

The region's population is projected to grow by 29% between 2023 and 2050, with the number of employed residents increasing by 35%, resulting in an expected increase in commute and non-commute trips. The proposed plan's development pattern and strategies influence where and how people live and travel, including household automobile ownership, as shown in **Table 2-8**. New housing in areas with better access to transit and services is expected to support reduced automobile ownership, contributing to a projected increase in the share of households with zero vehicles—from 9% in 2023 to 13% in 2050. The share of one-automobile households is expected to remain steady at 33%, while households with multiple automobiles is expected to decline from 59% to 54%. At the same time, average household automobile ownership is expected to rise slightly, from 1.42 to 1.45. This suggests that while more households will own fewer or no cars, overall vehicle ownership will still grow—becoming more concentrated among higher-income, multi-vehicle households.

Table 2-8: Summary of Population, Employed Residents, and Automobile Ownership

	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Total Population	7,465,000	9,599,000	2,134,000	29%
Total Employed Residents	3,817,000	5,160,000	1,343,000	35%
Share of Households with Zero Automobiles	9%	13%	4	44%
Share of Households with One Automobile	33%	33%	0	0%
Share of Households with Multiple Automobiles	59%	54%	-5	-8%
Average Number of Vehicles by Household	1.42	1.45	0.03	2%

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Regional Travel

Table 2-9 summarizes changes in average daily travel metrics between 2023 and 2050. As previously noted, regional growth is expected to increase demand on the transportation system. Total daily trips are forecasted to grow by 27%, which is slightly less than the 29% increase in population, indicating a modest decline in trips per capita by 2050. Similarly, commute trips are forecasted to rise by 33%, which is below the 62% increase in employed residents noted in **Table 2-8**, suggesting a decrease in commute trips per worker over time.

The daily number of vehicle trips and vehicle miles traveled (VMT)—key metrics for this program EIR and discussed in more detail in Section 3.15, "Transportation"—are forecasted to increase by 2050, though at a slower rate than population growth. As a result, daily VMT per capita decreases over time, indicating that, on average, people will drive less, either by making shorter trips and/or by shifting to alternative modes such as transit, walking, or biking. Transit boardings and transit passenger miles are forecasted to grow significantly, by 215% and 256%, respectively, in part because of the proposed plan's integrated land use and transportation strategies, which focus growth near transit and expand transit service. Meanwhile, limited roadway capacity expansion, as discussed in the prior section, coupled with regional growth, is expected to lead to an increase in vehicle delay on the region's roadways.

Table 2-9: Summary of Daily Travel Metrics

	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Daily Commute Trips	6,674,000	8,883,000	2,210,000	33%
Daily Non-Commute Trips	18,190,000	22,614,000	4,424,000	24%
Daily Trips Subtotal	24,864,000	31,497,000	6,633,000	27%
Daily Vehicle Trips	20,044,000	22,513,000	2,468,900	12%
Daily VMT	146,877,000	178,605,000	31,728,000	22%
Daily VMT per Capita	19.8	18.6	-1.2	-6%
Daily Vehicle Hours of Recurring Delay[1]	210,100	591,000	380,800	181%
Daily Transit Boardings	1,042,000	3,282,000	2,240,000	215%
Daily Transit Passenger Miles	6,150,000	21,907,000	15,758,000	256%

Note: Forecasts of average weekday travel activity do not reflect expected impacts from Strategy EN9 due to modeling limitations. Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.

[1] Increase due to primarily local traffic.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 2-10 compares average trip characteristics for commute and non-commute trips between 2023 and the proposed plan conditions in 2050. The implementation of the proposed plan's integrated strategies supports a more compact, mixed-use forecasted development pattern. As a result, average trip lengths are forecasted to decrease by 5% for commute trips and 4% for non-commute trips, reflecting the influence of land use changes that bring housing, jobs, and services closer together.

Table 2-10: Average Trip Length (Miles) by Purpose

	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Commute	9.7	9.2	-0.5	-5%
Non-commute	4.6	4.4	-0.2	-4%
All Trips	6.0	5.7	-0.3	-5%

Note: Forecasts of average weekday travel activity do not reflect expected impacts from Strategy EN9 due to modeling limitations.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Conversely, average trip time is forecasted to increase by 19% between 2023 and 2050, as shown in **Table 2-11**. This increase varies by mode. Automobile trip times are forecasted to rise by 18%, while walk and bike trip times are forecasted to decrease by 3% and 4%, respectively, reflecting improvements in active transportation networks and more compact development. Transit trip times, which are currently more than twice the regional average, are also forecasted to increase, though at a slower rate than automobile trips, due in part to service enhancements and better network integration, which enables an increase in longer trips, among other benefits.

Table 2-11: Average Trip Time (Minutes) by Mode

	Base Year, 2023	Proposed Plan, 2050	Change, 2023 to 2050	
			Numerical	Percent
Automobile ("Vehicle")	13.6	16.0	2.4	18%
Transit	40.2	42.0	1.8	4%
Bike	11.0	10.7	-0.3	-3%
Walk	17.3	16.6	-0.7	-4%
All Trips	15.0	17.8	2.8	19%

Note: Forecasts of average weekday travel activity do not reflect expected impacts from Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Daily Trips by Mode

The transportation strategies described in Section 2.2.2, "Proposed Plan Strategies," generally aim to either manage travel demand or enhance the supply of transportation systems. Together with the forecasted development pattern, these integrated strategies influence how people choose to travel. By 2050, implementation of the proposed plan is forecasted to result in a 264% increase in bike trips and a 183% increase in transit trips. As shown in **Table 2-12**, while the overall distribution of travel modes remain similar to 2023 conditions, notable shifts occur: transit mode share doubles from 4% to 8%, and bike mode share rises from 2% to 7%. At the same time, automobile-based modes—drive alone, carpool and ride hail—are forecasted to decline in combined share from 81% in the baseline to 71% in 2050.

Table 2-12: Summary of All Trips by Mode

	Base Year 2023		Proposed Plan, 2050		Change, 2023 to 2050	
	Trips	% of Total	Trips	% of Total	Numerical	Percent
Drive Alone	11,349,000	46%	12,811,000	41%	1,462,000	13%
Carpool	8,045,000	32%	8,865,000	28%	819,800	10%
Ride Hail	650,200	3%	837,200	3%	187,000	29%
Automobile ("Vehicle") Subtotal	20,044,000	81%	22,513,000	71%	2,469,000	12%
Transit	906,900	4%	2,568,000	8%	1,661,000	183%
Bike	570,600	2%	2,075,000	7%	1,505,000	264%
Walk	3,342,000	13%	4,341,000	14%	998,600	30%
All Trips	24,864,000	100%	31,497,000	100%	6,633,000	27%

Note: Forecasts of average weekday travel activity do not reflect expected impacts from Strategy EN9 due to modeling limitations. Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Under the proposed plan, commute trips account for approximately 28% of all regional trips (see **Table 2-10**), yet their average distance is twice that of non-commute trips (see **Table 2-10**). **Table 2-13** summarizes how Bay Area workers travel to work including people working from home. Overall, workers are forecasted to rely less on automobile modes, with the share of commute trips made by car—whether driving alone, carpooling, or ride-hailing--declining from 58% to 48% of all commute trips. The share of drive-alone commuters is forecasted to drop by 10%

While work-from-home rates surged during the COVID-19 pandemic, the number of people working from home is expected to slightly decline through 2050 as more employers bring workers back to the workplace. Among alternative modes, transit is forecasted to see the greatest growth, followed by workers biking to work. These shifts reflect the impact of the proposed plan's integrated strategies, which reduce reliance on automobiles and support a growing share of commute trips via transit and biking.

Table 2-13: Summary of Journey to Work by Mode

	2023 Baseline	2050 Proposed Plan	Change, 2023 to 2050
	% of Total	% of Total	Percent
Drive Alone	41%	31%	-10%
Carpool	16%	16%	0%
Ride Hail	1%	1%	0%
Automobile ("Vehicle") Subtotal	58%	48%	-10%
Transit	6%	14%	8%
Bike	3%	6%	4%
Walk	2%	2%	0%
Work from home	31%	29%	-2%

Note: Forecasts of average weekday travel activity do not reflect expected impacts from Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

2.3 PLANNING ASSUMPTIONS

Economic, demographic, and financial planning assumptions are central to the proposed plan and serve as constraints during the plan's development. These assumptions are described in detail below. As noted in Chapter 1, "Introduction," the proposed plan development process was composed of several key phases. The currently adopted Plan Bay Area 2050 served as a "first draft" of the proposed plan; the Draft Blueprint refined Plan Bay Area 2050 and used the regional growth forecast to define the region's overall growth potential; and the Final Blueprint refined and expanded strategies producing the final 35 strategies of the proposed plan.

2.3.1 Regional Growth Forecast

The regional growth forecast identifies how much the Bay Area is expected to grow between 2020 and the proposed plan's horizon year of 2050, including projections for population, jobs, households, and housing units. During the Blueprint planning phase (fall 2023 to winter 2025) the Draft Blueprint served as a "first draft" of the proposed plan and used the regional growth forecast to define the region's overall growth potential. The draft regional growth forecast was released in fall 2023; the final regional growth forecast was included in the Final Blueprint, which was approved by MTC and ABAG in January 2025 to be carried into the Final Blueprint.

Because the proposed plan is a limited and focused update to Plan Bay Area 2050, the regional growth forecast retains the methodology, approach, and key assumptions from Plan Bay Area 2050. That methodology was developed by MTC and ABAG staff, in collaboration with a consultant team and a technical advisory committee, and was formally adopted by the ABAG Executive Board in September 2019.

New data, including results from the 2020 Decennial Census, revealed the Bay Area's population baseline was nearly 200,000 lower than previously projected. This led to a numerical update to the forecast, extending the base period by three additional years, while keeping the original methodology and assumptions intact.

The revised forecast for the proposed plan projects that between 2020 and 2050, the Bay Area will add 1.4 million jobs, reaching just over 5.4 million total jobs. The region's population is projected to grow by 1.8 million people, reaching 9.6 million, and will be distributed across 3.8 million households, an increase of nearly 1 million households from 2020. These projections for population, employment, households, and housing units are summarized in **Table 2-14**.

The housing unit forecast assumes no net growth in the in-commute from outside the region, consistent with State law and a legal settlement between MTC, ABAG, and the Building Industry Association. As a result, the projection includes housing for all projected households, but also for the additional units needed to accommodate workers estimated to otherwise commute into the region.

Table 2-14: Regional Growth Forecast of Population, Employment, Households, and Housing Units

	Regional Growth Forecast				
	2020	2035	2050	Change 2020 to 2050	Change 2020 to 2050 (%)
Population	7,749,000	8,476,000	9,586,000	1,837,000	24%
Employment	4,025,000	4,855,000	5,436,000	1,411,000	35%
Households	2,798,000	3,312,000	3,796,000	998,000	36%
Housing Units	2,875,000	3,486,000	3,996,000	1,121,000	39%

Notes: Whole numbers have been rounded to the nearest 1,000.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

2.3.2 Financial Forecasts

The proposed plan includes a financially constrained transportation investment strategy pursuant to RTP/SCS requirements as defined by State and federal planning regulations. It includes transportation projects and programs that would be funded through existing and future revenues that are projected to be reasonably available to the region over the 25-year plan horizon (2025–2050). A total of $406 billion is forecasted to be available for the financially constrained transportation investment strategy from existing revenue sources, $17 billion from already secured project specific funding, and at least $89 billion in new revenues have also been identified.

Although not required by State and federal RTP/SCS requirements, the proposed plan has also identified funding needs and revenues for affordable housing and environmental resilience strategies, as well as revenues to support select economic development as follows:

- **Housing Element**: $161 billion in existing funding and $339 billion in new revenues
- **Economy Element**: $246 billion in new revenues
- **Environment Element**: $31 billion in existing funding and $188 billion in new revenues

For more information, see the Draft Technical Assumptions Report found at the Plan Bay Area 2050+ website: planbayarea.org/draftplan.

Whereas the revenues and strategy costs for the housing and economy elements of the proposed plan are self-contained (e.g., housing revenues pay for housing strategies) there is a connection between the transportation and environment elements. This is because a handful of transportation investments are nested within environment strategies.

Of the $512 billion in forecasted transportation revenues, approximately $11 billion are directed toward environmental strategies. These revenues fund strategies that increase adoption of electric vehicles and support expanded transportation demand management initiatives, two high-impact strategies for GHG emissions reductions. Additionally, some transportation revenues are expected to support select transportation infrastructure adaptation projects under Strategy EN1, "Adapt to Sea Level Rise."

TRANSPORTATION ELEMENT REVENUE FORECAST

MTC worked with partner agencies and used financial models to estimate how much revenue will be available to fund transportation investments across the 25-year plan horizon (2025–2050). Like other metropolitan regions, the Bay Area receives transportation funding from multiple federal, State, regional, and local sources. As shown in **Table 2-15**, below, the total funding envelope for the proposed plan's transportation project list is $512 billion.

Table 2-15: Forecasted Transportation Revenue Envelope (in Billions, YOE$)

	Forecasted Transportation Revenues
Federal	$50
State	$103
Regional	$54
Local	$199
Secured	$17
Existing Revenues Subtotal	$423
New Revenues	$89
Regional Total	$512

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

TRANSPORTATION ELEMENT SYSTEM NEEDS

MTC collaborated with local jurisdictions, transit operators, and the California Department of Transportation (Caltrans) to develop cost estimates for operating and maintaining the Bay Area's transit systems, local streets and roads, the State highway system, and local and regional bridges. These estimates also account for costs to operate and maintain traffic management infrastructure, such as ramp meters and dynamic signage. As shown in **Table 2-16**, the Bay Area is projected to require approximately $380 billion in total spending for operations and maintenance over the plan horizon.

Table 2-16: Costs to Operate and Maintain Existing System (in Billions, YOE$)

	Cost to Maintain Existing Systems
Local Streets and Roads	$72
Local Bridges	$3
Regional ("Toll") Bridges	$20
State Highways	$28
Transit Operating	$183
Transit Capital	$66
Transit Capital: Zero-Emission Fleet Incremental Cost	$8
Regional Total	$380

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

2.3.3 Analysis Tools

The California Transportation Commission's (CTC's) 2024 RTP Guidelines recommend that the largest metropolitan areas integrate regional economic and land use models and activity-based travel demand models into a single modeling system. The integrated model framework allows planners to analyze the complex interactions between land use and the transportation strategies. For more information, see the Forecasting and Modeling Report found at the Plan Bay Area 2050+ website: planbayarea.org/draftplan.

As required under SB 375, MTC must submit to CARB a description of its proposed technical methodology to estimate GHG emissions resulting from implementation of the proposed plan. The initial methodology was submitted June 26, 2023, and reviewed by CARB staff. After CARB staff's review, ongoing consultation between MTC and CARB staff led to multiple revisions to the technical methodology. Consultation will be ongoing until the adoption of the proposed plan by MTC and ABAG and its official submittal of the adopted plan to CARB.

BAY AREA URBANSIM

Bay Area UrbanSim, MTC and ABAG's regional land use forecasting model, is a spatially detailed economic model that forecasts where businesses ("employment") and households will locate in the future. MTC and ABAG used earlier versions of this model to support the EIRs for Plan Bay Area and Plan Bay Area 2040, and Version 2.0 for the Plan Bay Area 2050 EIR. For Plan Bay Area 2050+, MTC and ABAG used Bay Area UrbanSim 2.6 ("BAUS 2.6"), which is a minor update to version 2.0.

BAUS 2.6 begins with a base-year database that integrates data from various sources on buildings, households, business, and land use policies across the region. The model then projects growth in five-year increments by adhering to the Plan Bay Area 2050+ regional growth forecast adopted by MTC and ABAG. New households and jobs are allocated across the region through sub-models that account for market conditions, accessibility, and land use policies. BAUS 2.6 also integrates strategies from Plan Bay Area 2050+—such as density and intensity changes—that shape the location and pattern of future development.

By combining the preferences of households, businesses, and developers with the existing built environment and policy framework, BAUS 2.6 generates forecasts of future land use patterns. If land use policies are changed—for example, by increasing allowable residential density—the model adjusts its forecasts to reflect the new development potential. BAUS 2.6 produced all the key outputs used in assessing the significance of the forecasted development pattern. The parcel-level simulations are aggregated to generate land use data at the Traffic Analysis Zone (TAZ), subcounty, and county level, and serve as input.

TRAVEL MODEL

MTC and ABAG used Travel Model 1.6 to inform the Plan Bay Area 2050+ EIR. Travel Model 1.6 is a regional activity–based travel model used to simulate daily travel across the Bay Area. It forecasts how, when, and where people travel by accounting for trip purpose, time of day, travel mode, and destination. The model captures how travelers respond to transportation projects and policies, quantifying the collective impact of individual decisions on the region's transportation networks.

This model is composed of a set of individual models that perform different functions, leading to projections of future Bay Area travel. The modeling framework includes two primary tools: a population synthesizer and the travel model itself. The population synthesizer creates a synthetic population of individuals and households, assigning detailed characteristics to ensure realistic simulation of daily

activities. These characteristics are calibrated at the TAZ level to align with Census data and land use forecasts. Travel Model 1.6 then uses this synthetic population to simulate weekday travel behavior under typical conditions—school in session, favorable weather, and no major disruptions. The model represents aggregated behavior of vehicles and transit riders. Key improvements In Travel Model 1.6 include a new work-from-home model and updated mode choice models to reflect post-COVID travel preferences. Travel Model 1.6 has been extensively reviewed by federal and State agencies.

Vehicle activity forecasts are correlated to changes in land use data and transportation strategies. Travel Model 1.6 divides the region into 1,454 TAZs, which contain key land use data (from UrbanSim 2.6) to inform travel patterns. Various transportation strategies were analyzed using this model. To analyze the proposed plan, strategies (made up of both capital projects and policies) were implemented in the model on top of the region's existing transportation infrastructure. By adding these strategies into the model framework, it is possible to forecast the impacts of strategies on regional travel patterns. Travel Model 1.6 produces key outputs for assessing the significance of the transportation, air quality, GHG, and noise chapters. Key model outputs include total daily vehicle trips, VMT, and distribution of VMT by speed.

Travel Model 1.6 is not sensitive to the full range of strategies in the proposed plan. Marketing and education campaigns, as well as non-capacity-increasing transportation investments like bikeshare programs (i.e., Strategy EN9, "Expand Travel Demand Management Strategies"), are examples of strategies with the potential to change behavior in ways that result in reduced vehicle emissions. Travel Model 1.6 and the Emission Factor (EMFAC) model do not estimate reductions in emissions in response to these types of changes in traveler behavior. As such, an "off-model" approach was used to quantify the GHG reduction benefits of these important programs.

2.3.4 Proposed Plan Growth Geographies

The proposed plan designates specific geographic areas—known as Growth Geographies—in order to guide where future household and job growth would be focused under the proposed plan's strategies over the next 25 years. The Growth Geographies are a mix of a) areas designated by local jurisdictions—PDAs and PPAs; and b) areas defined by criteria related to transit service and access to opportunity—TRAs and HRAs. Although future development is not solely limited to Growth Geographies, these places are likely to accommodate the bulk of new homes and jobs in Plan Bay Area 2050+, similar to Plan Bay Area 2050. The proposed plan's approach for leveraging strategies remains "focused growth" in existing communities along the existing transportation network, as evidenced by the descriptions and general locations of the Growth Geographies described below. This focused growth approach helps to achieve key regional economic, environmental, and equity goals by building upon existing community characteristics and leveraging existing infrastructure while reducing effects on areas with less development.

The proposed plan includes the designation of Growth Geographies for both housing and jobs. For housing, Growth Geographies include PDAs, HRAs, and TRAs. For jobs, Growth Geographies include PDAs, PPAs, and TRAs. HRAs identified by the State of California were included as a housing Growth Geography to counterbalance housing policies that have historically led to limited housing development, particularly housing affordable to low-income households. TRAs, areas close to rail, ferry, or frequent bus service, were included as Growth Geographies to support climate emissions goals, with more housing near transit allowing more people to have access to sustainable transportation options.

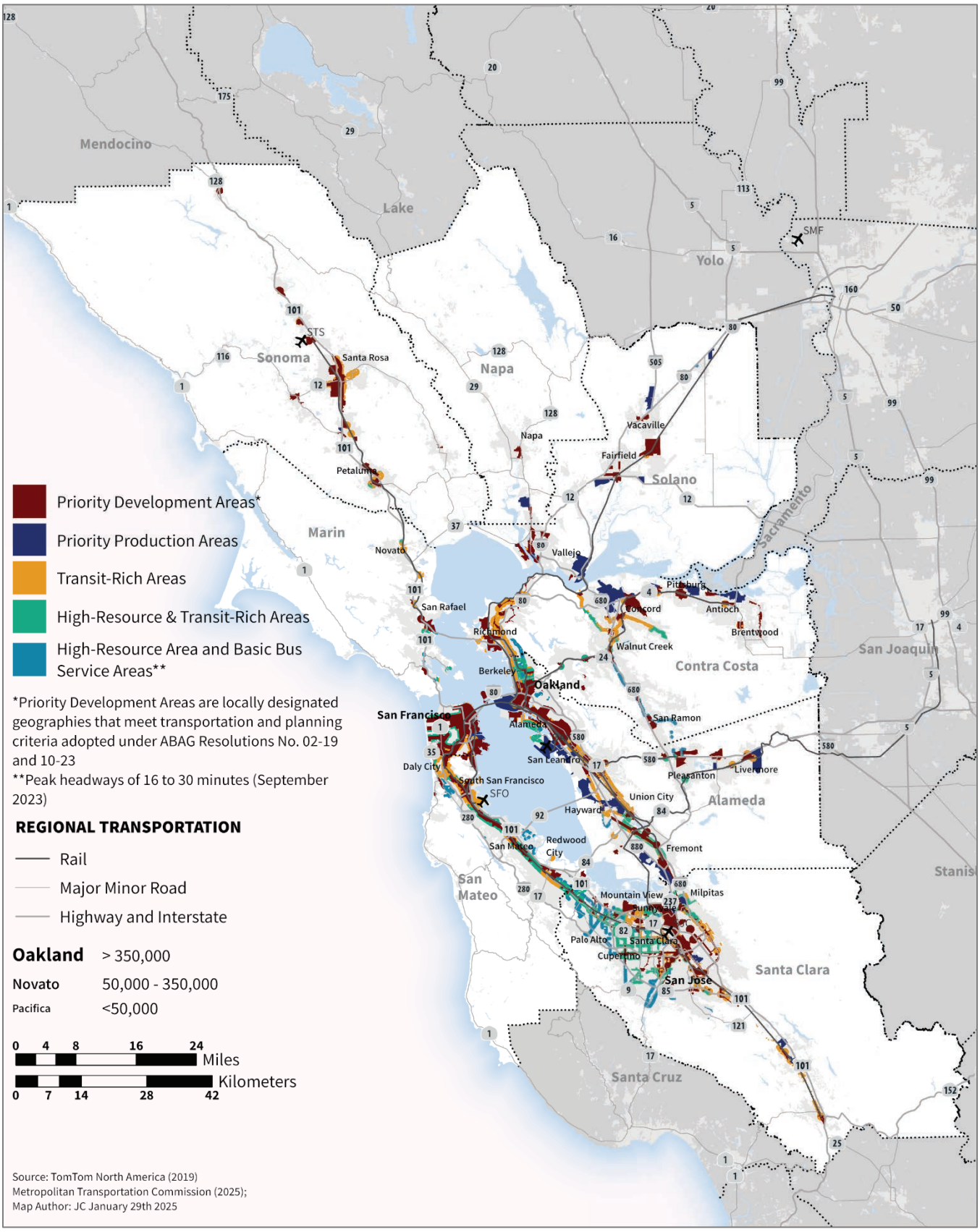
Some Growth Geographies are a combination of categories. Most locally designated PDAs also meet the TRA criteria, and many meet the HRA criteria. A smaller number of PDAs are served by less frequent bus service that does not meet the TRA criteria but is above the minimum transit service requirement for PDAs. PPAs, meanwhile, do not overlap with TRAs served by regional rail, but may overlap with bus-served TRAs, and may

also overlap with HRAs. The mix of Growth Geographies in each local jurisdiction is determined by whether or not the jurisdiction designated PDAs on at least 50% of the land in its boundaries eligible for PDA designation. In jurisdictions that designated at least 50% of this land as a PDA, the Growth Geographies are limited to PDAs and PPAs. As a result, in these jurisdictions TRAs and HRAs within PDAs and PPAs are included as Growth Geographies, while TRAs and HRAs outside of PDAs and PPAs are not. In jurisdictions that designated PDAs on less than 50% of eligible land, Growth Geographies include: 1) any locally nominated PDAs and PPAs; 2) TRAs outside PDAs and PPAs; and 3) HRAs that are outside PDAs and PPAs, and either within a TRA or within a quarter mile of a bus stop served by one or more route with peak headways of 30 minutes or less.

The following Growth Geography criteria were adopted by MTC and ABAG (see **Figure 2-5** and **Table 2-17** for more detail):

- Growth Geographies designated by local jurisdictions:
  - **Priority Development Areas (PDAs)**— Places nominated by local governments served by transit and planned for new homes and jobs at densities necessary to support effective transit service. All PDAs are supported by a resolution by the local government and approved by the ABAG Executive Board. (See ABAG Resolution 02- 2019 for detailed criteria).
  - **Priority Production Areas (PPAs)**— Industrial areas of importance to the regional economy and local communities that support middle-wage jobs. Like PDAs, PPAs are backed by a local government resolution and approved by the ABAG Executive Board. Industries in PPAs typically require larger sites than those in PDAs with different transportation needs (See ABAG Resolution 02-2019 for detailed criteria).
- Growth Geographies in local jurisdictions that have designated less than 50% of the PDA eligible areas as PDAs:
  - **Transit-Rich Areas (TRAs)**— Places near rail, ferry or frequent bus service that were not already identified as PDAs. Across the region, this includes all areas outside PDAs subject to the Transit-Oriented Communities Policy. Furthermore, in jurisdictions where local governments have nominated PDAs on less than 50% of the land eligible for nomination, this also includes areas within 1/2 mile of a bus stop with peak service frequency of 15 minutes or less.
  - **High-Resource Areas (HRAs)**—State-identified places with well-resourced schools and access to jobs, among other criteria. This designation only includes places that meet a baseline transit service threshold of bus service with peak headways of 30 minutes or better as defined during Plan Bay Area 2050. In addition, HRAs are only included if less than 50% land eligible for PDA designation land has been nominated by the local jurisdiction in question. Some HRAs also meet the designation of TRAs, meaning they are both well-resourced and transit-rich.
- Exceptions and Exclusions:
  - Areas within ½ mile of a rail station, regardless of whether the local jurisdiction nominated more than 50% of the PDA eligible areas as PDA, are **included** in the TRA Growth Geography.
  - Very High and High Fire Hazard Severity Areas identified by the California Department of Forestry and Fire Protection or locations within a county-adopted wildland-urban interface area are **excluded** from Growth Geographies.
  - Areas of sea level rise inundation (i.e., areas at risk from sea level rise through year 2050 that lack adaptation strategies in the proposed plan's Environment Element) are **excluded** from Growth Geographies.
  - Areas outside locally adopted urban growth boundaries, or in a protected open space, including parkland are **excluded** from Growth Geographies.

Figure 2-5: Growth Geography Designations by Type



Source: TomTom North America 2019; MTC 2025.

Table 2-17: Growth Geography Designations by County and Class

County	Total Land (acres)	Designated Growth Geography					
		PDA (acres)	PPA (acres)	HRA (acres)	HRA and TRA (acres)	TRA (acres)	Subtotal (acres)
Alameda	472,000	29,500	17,100	2,300	8,700	12,200	69,800
Contra Costa	458,800	16,000	8,500	4,200	2,900	12,300	43,900
Marin	332,900	2,100	0	800	900	1,500	5,300
Napa	481,300	990	1,100	0	0	0	2,100
San Francisco	29,900	18,400	720	0	2,500	1,200	22,900
San Mateo	287,100	10,600	9	3,100	5,100	8,100	26,900
Santa Clara	826,300	27,100	2,700	12,100	20,700	12,900	75,600
Solano	525,900	8,400	6,800	100	0	320	15,600
Sonoma	1,008,000	11,800	140	30	220	4,700	16,900
Regional Total	4,422,000	124,900	37,200	22,600	41,000	53,200	279,000

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, greater than 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In total, the proposed plan designates 6% of the region's land area to a Growth Geography. Santa Clara County has the most land designated as a Growth Geography, followed by Alameda and Contra Costa Counties. San Francisco County has the highest percentage of its land area (77%) designated as a Growth Geography. Alternatively, Napa County has the fewest land acres designated as a Growth Geography. Locally designated PDAs make up the majority (45%) of the Growth Geography designation acres. PPAs account for 13% of the Growth Geography area and generally occur in Alameda County. There are two types of HRAs: those that are transit-rich and those with basic transit service. Collectively, HRAs account for 23% of the Growth Geography area and are predominately found in Santa Clara County. TRAs, including those that overlap with HRAs, account for 34% of the Growth Geography area. The majority of TRA designations occur in Alameda, Contra Costa, and Santa Clara Counties.

TRANSIT PRIORITY AREAS

Approval of an adopted SCS by CARB allows for CEQA streamlining benefits for transit priority projects (TPPs). Please see Section 1.9, "CEQA Streamlining Opportunities," for more information regarding CEQA streamlining opportunities. A TPP is defined by statute, based on consistency with the following requirements:

- consistent with the general land use designation, density, building intensity, and applicable policies specified for the project area in the SCS;
- located within a half-mile of a major transit stop or high-quality transit corridor;
- made up of at least 50% residential use based on total building square footage or as little as 26% residential use if the project has a floor area ratio of not less than 0.75; and
- built out with a minimum of 20 dwelling units per acre (PRC Section 21155).

For the purposes of this EIR, geographic areas eligible to meet the TPP requirements are referred to as TPAs.

RELATIONSHIP BETWEEN GROWTH GEOGRAPHIES AND TPAS

The proposed plan's Growth Geographies promote compact development in established communities with high-quality transportation access while placing less development pressure on the region's vast and varied open spaces and agricultural lands. The major difference between TPAs and the proposed plan's Growth Geographies is how they are designated. As discussed above, a PDA and PPA are identified by a local agency for adoption by ABAG. While HRAs are defined by the State of California they must meet the transit service thresholds identified in the plan. TPAs are akin to TRAs, in that they are areas that meet specific considerations; however, TPAs are more narrowly defined than TRAs by the series of requirements described above. The Growth Geographies and TPAs are similar in that they emphasize access to transit service and are appropriately planned for growth.

2.4 PLAN BAY AREA 2050+ DOCUMENT

2.4.1 Document Framework

The proposed plan document is organized into five chapters, plus a stand-alone Implementation plan, which are listed and briefly summarized as follows:

- **Meeting the Moment: The Bay Area Today**: This chapter provides an overview of current challenges that the Bay Area is facing. The challenges are organized by the plan document's five guiding principles (affordability, connectivity, diversity, health and vibrancy). Additionally, the Introduction section highlights key baseline data, residents' voices collected through the public engagement process and a review of past milestones and progress across transportation, land use and environmental projects.
- **Using the Plan: Defining and Leveraging the Components**: This chapter discusses the RTP/SCS requirements and highlights the ways in which Plan Bay Area 2050+ integrates aspirational components. Critically, the chapter defines the core parts of the plan. This chapter also describes the Plan Bay Area 2050+ public engagement process, the plan document's evolution over the last three cycles and the Transit 2050+ process.
- **Understanding the Context: Trends, Assumptions, Needs and Revenues**: This chapter includes descriptions of the planning assumptions and financial forecasts that have shaped the development of the plan's strategies, outcomes, and implementation activities. Key items highlighted in this chapter include external forces beyond government control (e.g. unmitigated sea level rise); regional growth forecast of population, jobs and housing; and financial needs and revenue forecasts for the four elements (transportation, housing, economy and environment).
- **Developing the Plan: Strategies for the Bay Area**: This chapter describes the plan's policy and investment proposals. The plan's four elements (transportation, housing, economy and environment) are subsections within the chapter and are further organized by the plan's 11 themes. The chapter's primary discussion focuses on explaining significant strategy refinements, including the planning needs, ongoing implementation progress, and engagement feedback that led to modifications.
- **Improving the Outcomes: Equity and Performance under Plan Bay Area 2050+**: This chapter reports on key equity and performance metrics including affordability, mobility, and GHG emissions (among others). The five guiding principles serve as the organizing framework for the descriptions of outcomes. This chapter also discusses the growth pattern for households and jobs across the region.
- **Starting the Work: Implementation Plan**: The Implementation Plan identifies near-term actions for MTC, ABAG, and other stakeholders to make meaningful progress toward implementation of the plan's

proposed 35 strategies. This plan includes refreshed implementation actions and associated timelines.

- **Supplemental Reports:** In addition to this EIR, the proposed plan also includes the following supplementary documents that will be made available at planbayarea.org/draftplan.
  - Air Quality Conformity and Consistency Report,
  - Equity Analysis Report,
  - Forecasting and Modeling Report,
  - Implementation Plan Supplemental Report,
  - Native American Tribal Engagement and Government-to-Government Consultation Report,
  - Performance Report,
  - Public Engagement Report,
  - Technical Assumptions Report,
  - Transit 2050+ Report,
  - Transportation Project List Report, and
  - Statutorily Required Plan Maps.

As noted in Section 1.7.3, "Federal and State Requirements," the RTP must comply with Section 65080 of the California Government Code. The State requirements largely mirror the federal requirements and require each transportation planning agency in urban areas to adopt and submit an updated RTP to CTC and Caltrans every 4 years. To ensure a degree of Statewide consistency in the development of RTPs, CTC adopted RTP Guidelines pursuant to Government Code Section 14522. The RTP Guidelines are intended to assist MPOs and RTPAs with developing RTPs that are consistent with federal and State planning requirements. The RTP Guidelines include a requirement for program-level performance measures, which include objective criteria that reflect the goals and objectives of the RTP. These goals and objectives are featured in the Draft Performance supplemental report to Plan Bay Area 2050+. The proposed plan follows the 2024 RTP Guidelines, which were adopted on January 26, 2024.

The 2024 RTP guidelines identify four elements that should be included in an RTP/SCS and have been included as part of the proposed plan:

- **1. Policy Element** that describes the transportation issues in the region, identifies and quantifies regional needs, and describes the desired short-range and long-range transportation goals, and objectives and policy statements. This element is included in the Plan Bay Area 2050+ document, specifically in the "Meeting the Moment" chapter, "Understanding the Context" chapter, the "Developing the Plan" chapter, and the Transit 2050+ report.
- **2. Sustainable Communities Strategy (SCS)** that identifies a forecasted development pattern that, when integrated with the transportation network, and other transportation measures and policies, will reduce regional GHG emissions from automobiles and light trucks, if there is a feasible way to do so. This information is included in the Plan Bay Area 2050+ document through components of the "Developing the Plan" chapter, "Improving the Outcomes" chapter as well as the Performance Report.
- **3. Action Element** that describes the programs and actions necessary to implement the plan and assigns implementation responsibilities. This information is included in the "Starting the Work" chapter of the Plan Bay Area 2050+ document, with further information included in the Implementation Plan Supplemental Report.

- **4. Financial Element** that summarizes the cost of plan implementation constrained by a realistic projection of available revenues. This information is included in the Technical Assumptions Report, with a summary featured in the "Understanding the Context" chapter of the Plan Bay Area 2050+ document.

2.4.2 Intended Uses of This EIR

The CEQA Guidelines (Section 15124[d]) require EIRs to identify the agencies that are expected to use the EIR in their decision making and the approvals for which the EIR will be used. This EIR will inform MTC and ABAG, in addition to other responsible agencies, persons, and the general public, of the potential environmental effects of the proposed plan and the identified alternatives. MTC and ABAG will use this EIR for the purposes of review and approval of the proposed plan.

This program EIR is a first-tier document that addresses the environmental impacts that may affect the nine-county Bay Area as a result of adoption and implementation of Plan Bay Area 2050+. Therefore, future programs or projects may "tier" from this program EIR, as stipulated in CEQA. "Tiering" refers to the coverage of general environmental analysis in broad, program-level EIRs, with subsequent focused environmental documents for individual projects that implement the program. If the potential environmental effects of consistent subsequent actions are adequately addressed by a certified program EIR, additional environmental analysis may be unnecessary. This finding can be substantiated using an initial study that evaluates whether the environmental effects of the subsequent project have already been adequately covered.

The lead agencies for projects analyzed in this program EIR may use it as the basis for cumulative analysis of specific project impacts, together with the projected growth in the region. Cities and counties may use information in this EIR in their future housing elements. Bay Area congestion management agencies may incorporate information provided in this EIR into future county transportation plans, such as congestion management programs, countywide transportation plans, and county bike and pedestrian plans. Other agencies expected to use this EIR include the California Department of Transportation, county transportation authorities, transit providers in the region (such as Muni, BART, AC Transit, SamTrans, Caltrain, SolTrans, WestCAT, Altamont Corridor Express, and Water Emergency Transit Authority), the Bay Conservation and Development Commission, the Bay Area Air District, and cities and counties.

Mitigation measures described in this EIR may be incorporated into project-level environmental impact analyses by project sponsors or local agencies as appropriate to mitigate identified project-level impacts.

This EIR is also intended to help activate the CEQA streamlining benefits of SB 375 for local jurisdictions and private development, described in Section 1.9.1, "Streamlining under SB 375."

2.4.3 Actions to Adopt and Implement the Proposed Plan

MTC and ABAG are the lead agencies for approval of the proposed plan and the associated environmental review (this EIR). Approval consists of three actions among MTC and ABAG:

- **Final Air Quality Conformity Determination for Plan Bay Area 2050+ | MTC:** As the first action, MTC must make a conformity determination under federal Clean Air Act Section 176(c). The Federal Highway Administration and the Federal Transit Administration make the final determination of conformity determination implementation.
- **Final Program Environmental Impact Report for Plan Bay Area 2050+ | MTC and ABAG:** The second action requires MTC and ABAG, as lead agencies, to certify the EIR is adequate under CEQA.

- **Final Plan Bay Area 2050+ | MTC and ABAG:** As the third and final action, the proposed plan requires joint approval by the MTC Commission and the ABAG Board.

Following adoption by MTC and ABAG, MTC and ABAG must submit the plan to CARB and Caltrans. While Caltrans is responsible for review of the RTP checklist, CARB must review the adopted SCS ("Plan Bay Area 2050+") to confirm and accept the MPO's determination that the SCS, if implemented, would meet the regional GHG emissions reduction target. If CARB determines the combination of strategies in the SCS would not meet the regional targets, MTC and ABAG must prepare an "alternative planning strategy" to meet the regional GHG emissions reduction target.

Once adopted by MTC and ABAG, Plan Bay Area 2050+ will guide regional transportation, housing, economic, and environmental strategies and investments for the region.

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3.1 APPROACH TO THE ANALYSIS

3.1.1 Introduction

This chapter is organized by environmental resource topic. Each resource topic is addressed in a separate section that presents an integrated discussion of the existing conditions (including environmental setting and regulatory setting) associated with the resource, significance criteria, method of analysis, potential environmental effects of the project (including direct and indirect impacts) on the resource, and mitigation measures to reduce significant effects.

Cumulative and growth-inducing impacts are discussed in Chapter 5, "Other CEQA-Mandated Sections."

3.1.2 Approach to the Environmental Analysis

In accordance with the State CEQA Guidelines (14 CCR Section 15126.2), this Draft EIR identifies and focuses on the direct and reasonably foreseeable indirect significant environmental effects that may result from the adoption and implementation of the proposed plan. The analysis considers the short-term and long-term effects of the project based on construction and operational assumptions described below.

As described in Chapter 1, "Introduction," this analysis focuses on those environmental resource topics for which potentially significant impacts were identified based on analysis of project data, review of comments received during project scoping, and additional research and analysis of relevant project data.

The remainder of this chapter addresses the following resource topics:

- Section 3.2, "Aesthetics and Visual Resources"
- Section 3.3, "Agriculture and Forestry Resources"
- Section 3.4, "Air Quality"
- Section 3.5, "Biological Resources"
- Section 3.6, "Climate Change, Greenhouse Gases, and Energy"
- Section 3.7, "Cultural Resources and Tribal Cultural Resources"
- Section 3.8, "Geology, Seismicity, and Mineral Resources"
- Section 3.9, "Hazards and Wildfire"
- Section 3.10, "Hydrology and Water Quality"
- Section 3.11, "Land Use, Population, and Housing"
- Section 3.12, "Noise"
- Section 3.13, "Public Services and Recreation"
- Section 3.14, "Public Utilities and Facilities"
- Section 3.15, "Transportation"

Sections 3.2 through 3.15 follow the same general format:

- **"Environmental Setting":** This subsection presents the existing environmental conditions within the plan area and in the surrounding area as appropriate, in accordance with State CEQA Guidelines Section 15125. The discussions of the environmental setting focus on information relevant to the issue under evaluation. The extent of the environmental setting area evaluated differs among resources, depending on the locations where impacts would be expected.
- **"Regulatory Setting":** This subsection presents information on the laws, regulations, plans, and policies that relate to the issue area being discussed. Regulations originating from the federal, state, and local levels are each discussed as appropriate.
- **"Impact Analysis":** This subsection presents significance criteria and discusses the potentially significant effects of the proposed plan on the existing environment in accordance with State CEQA Guidelines Section 15126.2. The methodology for impact analysis, along with any technical study upon which the analysis relies, is described in each section. The significance criteria are defined, and criteria for which the project would have no impact are disclosed and dismissed from further evaluation. Project impacts are organized by environmental topic abbreviation in each subsection (e.g., Impact AES-1, Impact AES-2, Impact AES-3, etc.).

  Each impact discussion presents the analysis, rationale, and substantial evidence upon which the conclusion is based. The determination of the impact's level of significance is shown in bold text. A "less-than-significant" impact is one that would not result in a substantial adverse change in the physical environment. A "potentially significant" impact or "significant" impact is one that would result in a substantial adverse change in the physical environment; both are treated the same under CEQA in terms of procedural requirements and the need to identify feasible mitigation. Feasible mitigation measures are identified to avoid, minimize, rectify, reduce, or compensate for significant or potentially significant impacts, in accordance with the State CEQA Guidelines Section 15126.4.

  Where an existing law, regulation, or permit specifies mandatory and prescriptive actions about how to fulfill a regulatory requirement of the project, leaving little discretion in its implementation, and would avoid an impact or maintain it at a less-than-significant level, the environmental protection afforded by the regulation is considered before determining impact significance. In other words, where existing regulatory or permitting requirements are law and binding on responsible agencies and project sponsors, it is reasonable to assume they would be implemented, thereby reducing impacts. Where existing laws or regulations specify a mandatory permit process for future projects, performance standards without prescriptive actions to accomplish them, or other requirements that allow substantial discretion in how they are accomplished, or have a substantial compensatory component, the level of significance is determined before applying the influence of the regulatory requirements. In this circumstance, the impact would be potentially significant or significant, and the regulatory requirements would be included as a mitigation measure.

  Mitigation is proposed, where feasible, to reduce potentially significant environmental impacts. For some impacts, mitigation measures are commitments by MTC and ABAG. For most impacts, MTC and ABAG do not have regulatory or approval authority over future projects. In those cases, MTC and ABAG identify specific mitigation measures for application by the lead agency. In order to rely on this EIR to streamline environmental review for an individual project, the lead agency must require the applicable mitigation measures as a part of the project-level environmental review. These commitments would obligate project sponsors to implement measures that would minimize or eliminate significant impacts pursuant to CEQA. The project sponsor or lead agency would be responsible for ensuring adherence to the mitigation measures during construction and operation of the project.

  Throughout the impact analysis, it is noted where projects using the CEQA streamlining provisions of Senate Bill 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures, as feasible, to address site-specific conditions. MTC and ABAG cannot require local implementing

agencies to adopt and enforce mitigation measures. It is ultimately the responsibility of a lead agency to adopt mitigation. Pursuant to State CEQA Guidelines Section 15126.4, subd. (a)(1)(A), this EIR distinguishes between measures that ABAG and MTC can implement and enforce as part of the proposed plan, and those measures which a local agency has the discretion to implement and enforce—the EIR characterizes the former as mitigation measures and the latter as measures that could reasonably be expected to reduce adverse impacts if required at the project-level.

3.1.3 General Methodology and Assumptions

BASELINE AND PLAN TIMEFRAME

Under CEQA, the impacts of a proposed project must be evaluated by comparing expected environmental conditions after project implementation to baseline conditions. Additionally, in order to assess the environmental impacts of the proposed plan, it is necessary to make assumptions about future environmental conditions at the time it is fully implemented. The changes in environmental conditions between those two scenarios represent the environmental impacts of the proposed plan. The State CEQA Guidelines Section 15125 states that an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation is published, or if no Notice of Preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.

As the CEQA Guidelines make clear, ordinarily the appropriate baseline will be the actual environmental conditions existing at the time of CEQA analysis (typically when the Notice of Preparation is published). In the case of the proposed plan, the Notice of Preparation was released on January 29, 2025. Therefore, pursuant to State CEQA Guidelines Section 15125, the analysis in this EIR generally uses the environmental conditions existing in the proposed plan vicinity in 2025 as the baseline (existing conditions). See the discussion under "Method of Analysis" for each technical section for a description of the baseline for the analysis.

The horizon year for the proposed plan is 2050. For comparisons where 2025 data are not available, the closest available year with comprehensive datasets is used to provide the most accurate picture practically possible. This includes using data from 2023 in the transportation and transportation-related analyses because it is the year with the most recent data readily available from public sources or using transportation outputs from the regional travel model. Additionally, the land use growth projection data uses a base year of 2020 as it is the most recently available data. An exception to this approach appears in Section 3.6, "Climate Change, Greenhouse Gases, and Energy," which includes a 2005 baseline to satisfy statutory requirements of Senate Bill 375 for benchmarking the year used for comparison to the proposed plan's greenhouse gas reduction targets, and a 1990 baseline for an assessment of the proposed plan's consistency with SB 32, which calls for a statewide reduction of GHG emissions to 40% from 1990 levels by 2030.

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that by 2050, the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1.0 million new households. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth, resulting in focused housing and job growth concentrated primarily in or adjacent to existing communities and along existing transit corridors. This analysis does not consider phasing of improvements or interim stages of the proposed plan between 2025 and 2050, because the required 4-year update cycle of the RTP/SCS results in regular, short-term adjustments to the plan. The one exception to this approach is Section 3.6, "Climate Change, Greenhouse

Gases, and Energy," which includes an examination of passenger vehicle emission impacts in 2035 and 2050 to satisfy requirements of Senate Bill 375 and determine if the project would result in a net increase in greenhouse gas emissions.

LEVEL OF DETAIL

As a program-level EIR that addresses the entire nine-county, 101-city region, this document does not address the impacts of individual land use and transportation projects in detail; the focus of this analysis is on addressing the impacts of implementation of the plan's 35 strategies as a whole. The analysis considers the impacts of the proposed plan in terms of the forecasted development pattern ("land use growth footprint"), sea level rise adaptation projects ("sea level rise adaptation projects footprint"), and transportation projects and programs ("transportation projects footprint"). The impact discussions generally disclose the potential effects of the proposed plan at two levels of geography: (1) at the regional level, which covers the Bay Area as a whole; and (2) where relevant, at the county level, which covers each Bay Area county.

QUANTITATIVE ANALYSES

This program-level EIR includes quantification of impacts when feasible. Quantifications are generally location based, while some quantifications result from travel activity and corresponding emissions. Where quantitative impact analyses rely on specific industry-standard methodology and modeling (i.e., MTC's Travel Model 1.6, CalEEMod, or EMFAC), the relevant sections include a description of the method of analysis. This section describes location-based analyses in more detail below.

Location-Based Analysis

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county).

For quantitative impact assessments, a geographic information system (GIS) was used to digitally overlay the proposed plan's footprints (i.e., land use growth, sea level rise adaptation projects, and transportation projects) associated with the forecasted development pattern, sea level rise adaptation projects, and transportation projects onto resource-specific data.

The land use growth footprint, representing the forecasted development pattern, is derived from the UrbanSim 2.0 land use model and represents the development or redevelopment of parcels of land simulated to accommodate the region's forecasted growth of households and jobs from 2020 through 2050 through new building(s). Precise building site(s) on the parcels are not known, therefore the land use growth footprint incorporates the entire parcel. Because of this assumption, the area of potential effects tends to be overstated when considering the land use growth footprint. It should be noted that this footprint includes some areas identified for development in local land use plans that are outside of the Growth Geographies (see **Table 2-4** in Chapter 2, "Project Description").

The proposed plan identifies several adaptation projects for regularly inundated shoreline areas, including a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Not all of these projects would be expected to require earthmoving activities and/or have a footprint associated with implementation. The footprint of sea level rise adaptation projects were spatially analyzed using known or approximate site plans for and the preliminary design information for individual projects.

The transportation projects footprint includes the proposed transportation projects and programs that have the greatest potential for physical impacts based on characteristics such as expansion, widening, new construction, or new configurations. The precise footprints and other design details of most proposed transportation projects are unknown because the projects are in the early stages of planning. Thus,

transportation projects (e.g., road widenings, new roads, new or expanded interchanges, and new rail transit infrastructure) were spatially analyzed by estimating the potential area of effects around the center line of proposed roadway and transit projects. Because of these estimation assumptions, the area of potential effects tends to be overstated when considering transportation projects.

Portions of the three footprints (land use growth, sea level rise adaptation projects, and transportation projects) overlap because the areas of potential effects are imprecise. This overlap is relatively insignificant, with all three footprints overlapping for a total of 6 acres. To provide a more accurate interpretation of the potential environmental impacts, the acreages of the land use growth, sea level rise adaptation projects, and transportation projects footprints are not combined or analyzed as one total and instead are presented independently throughout the analysis. This could result in an overestimation of impacts.

3.1.4 Standard Terminology

This Draft EIR uses the following standard terminology:

- **"No impact" ("NI")** means no change from existing conditions (no mitigation is needed).
- **"Less-than-significant impact" ("LTS")** means no substantial adverse change in the physical environment (no mitigation is required).
- **"Potentially significant impact" ("PS")** means an impact that might cause a substantial adverse change in the environment (mitigation is required because potentially significant impacts are treated as significant).
- **"Less than significant with mitigation ("LTS-M")** means an impact that would cause a substantial adverse change in the physical environment, but the impact would be reduced to a less-than-significant level with the incorporation of mitigation measures identified in this EIR.
- **"Significant and unavoidable impact" ("SU")** means an impact that would cause a substantial adverse change in the physical environment and that cannot be avoided, even with the implementation of all feasible mitigation.

3.1.5 Local Control

The region's cities, towns, and counties retain local land use authority, and local jurisdictions will continue to determine where future development occurs. The proposed plan is supported through implementation efforts, such as neighborhood-level planning grants for Priority Development Areas and local technical assistance. The proposed plan does not mandate any changes to local zoning rules, general plans, or processes for reviewing projects, nor does the plan provide an enforceable direct or indirect cap on development locations or targets in the region. As is the case across California, the Bay Area's cities, towns, and counties maintain control of all decisions to adopt plans and to permit or deny development projects.

The proposed plan also does not establish new state-mandated Regional Housing Needs Allocation (RHNA) numbers for any jurisdiction, but the RHNA is consistent with the proposed plan. The RHNA process is conducted on an 8-year cycle. The Bay Area is currently in the 6th RHNA cycle, which began February 1, 2023 and will continue through January 31, 2031. Therefore, the plan does not coincide with this update to the region's long-range plan.

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3.2 AESTHETICS AND VISUAL RESOURCES

This section describes the aesthetic and visual resources of the Bay Area and assesses the potential of the proposed plan to affect the region's aesthetic environment. Aesthetic value is subjective, but it is typically used as a criterion for evaluating those elements that contribute to the visual quality that distinguishes an area. Most communities identify scenic resources as an important asset, although what is considered "scenic" may vary according to its environmental setting. It is useful to think of scenic resources in terms of "typical views" seen throughout the Bay Area because scenic resources are rarely encountered in isolation. A typical view may include several types of scenic resources, including both natural elements and built spaces. Typical views seen in the Bay Area are described in the "Physical Setting" section, below.

There were no comments received in response to the Notice of Preparation related to aesthetics and visual resources.

3.2.1 Environmental Setting

PHYSICAL SETTING

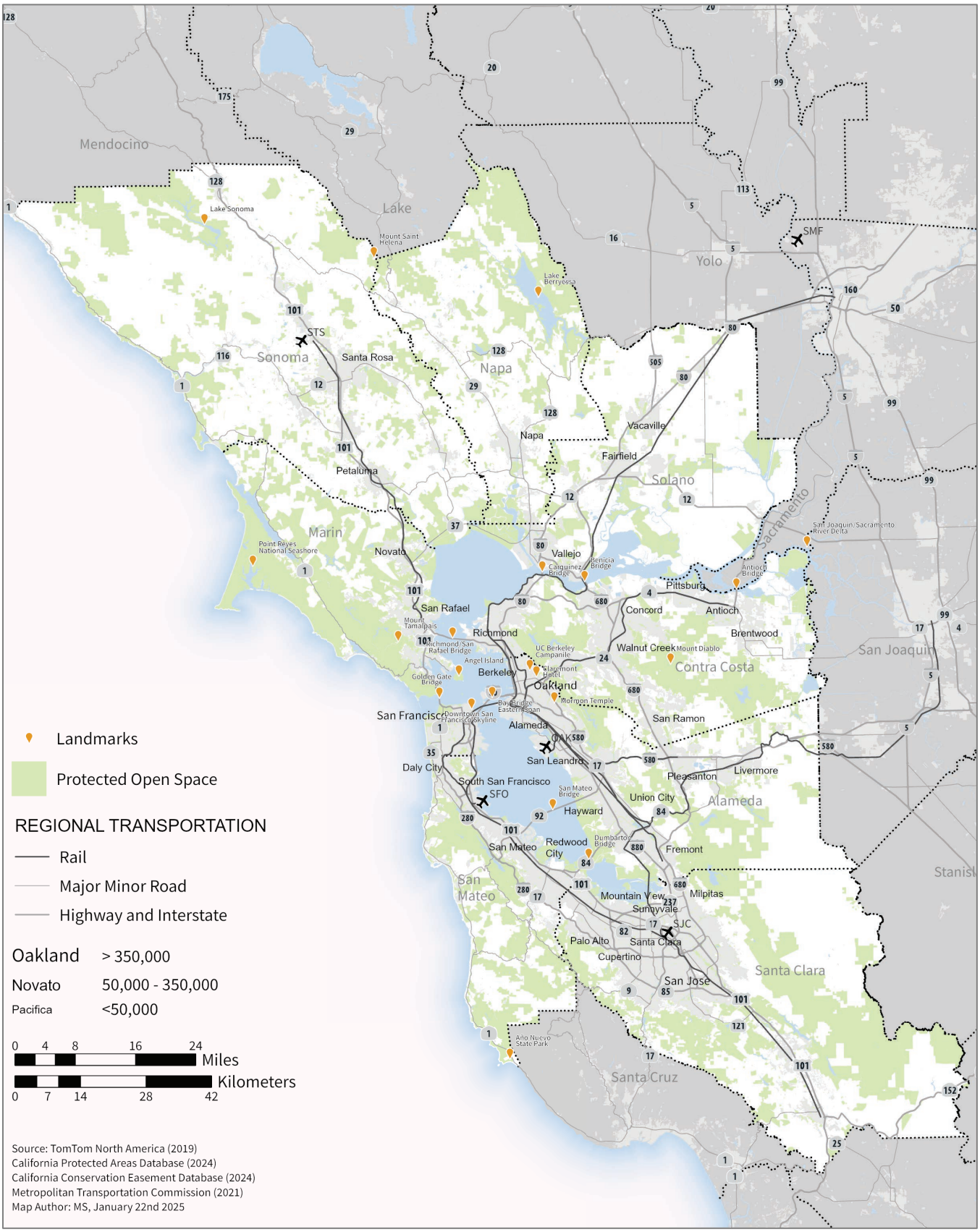
The Bay Area is characterized by the diversity of urban development and the combination of rural and agricultural landscapes, as well as the natural beauty and wildlife provided by the surrounding mountain ranges and rich wildlife habitats. It stretches along the central northern Pacific coast of California, with several branches of the Coast Ranges dividing it into valleys, plains, and water bodies. The largest of these valleys contains San Francisco Bay, whereas at the eastern edge of the region is the great Central Valley, a flat plain lying between the Coast Ranges and the Sierra Nevada. The hills of the Coast Ranges provide expansive views of the valleys and plains below, revealing a variety of development types, including urban areas along the bay plains and inland valleys, agricultural lands, and protected open space, and natural areas.

The landscapes of the San Francisco Bay Area are varied, unique, and recognized by many in the region and beyond. The basin formed by the Coast Ranges, East Bay hills, and San Francisco Bay itself are prominent physical features of the region. To the west, the Pacific Ocean and the Coast Ranges dominate the visual setting, stretching from Mount Tamalpais in the north to the Santa Cruz Mountains in the south. To the east, the Diablo Range, punctuated by Mount Diablo, provides a view of a different character. In the north, the vineyards of Napa and Sonoma Counties are unique and draw visitors from around the world. Many built features in the Bay Area—the Golden Gate and Bay Bridge and the San Francisco skyline in particular—are also of international renown. Bay Area residents and tourists alike value the variety and quality of the visual experiences that are found throughout the Bay Area, including urban and rural public spaces, regional parks, and transportation corridors in the region, including heavily traveled freeways, transit lines, and ferries, and narrow country roads through secluded forests and agricultural areas. **Figure 3.2-1** depicts the locations of major scenic resources found in the Bay Area. Major land use and/or transportation projects may affect the visual experiences of travelers and the distinctive visual environment of the region.

Hills and Valleys

The Bay Area contains several distinct mountain ranges and hills. Along the peninsula between the Pacific Ocean and San Francisco Bay lie the coastal hills of San Mateo and Santa Clara Counties and, north of the Golden Gate, the hills of Marin County.

Figure 3.2-1: Major Bay Area Scenic Resources



Sources: TomTom North America 2019; California Protected Areas Database 2024; California Conservation Easement Database 2024; MTC 2021.

The East Bay hills rise steeply from the urbanized plain along the eastern edge of the Bay, forming a several mile–wide band that also defines the western edge of the Diablo and Livermore Valleys of Contra Costa and Alameda Counties. The rolling hills of the Diablo Range separate these valleys from the lowlands of the Central Valley. These hills converge at the south end of the Bay Area in Santa Clara County. To the north, several ranges frame the Napa and Sonoma valleys.

Between these ranges and hills are numerous valleys, both broad and narrow. San Francisco Bay, for example, is bordered along the east and west by a narrow, heavily urbanized plain. This plain widens in the south into the Santa Clara Valley, which, until World War II, was primarily agricultural. The East Bay and coastal hills, which are visible throughout these lowlands, orient viewers and give a sense of scale to the surrounding urban areas. Likewise, to the north, the hills forming the Sonoma and Napa valleys enclose these agricultural areas with urban pockets.

Landmarks and Gateways

Certain features of the Bay Area stand out as symbols and points of orientation (see **Figure 3.2-1**). These landmarks include the Golden Gate and Bay Bridges, Alcatraz and Angel Islands, San Francisco skyline, several large buildings in the East Bay hills (the Campanile on the University of California, Berkeley, campus; the Claremont Hotel; and the Mormon Temple in Oakland, for example), and Mount Saint Helena at the northern end of the Napa Valley. These landmarks help visitors and residents locate themselves within the region and, in the case of the Golden Gate Bridge, symbolize the Bay Area for the rest of the world.

Waterways

The Bay Area is home to a number of bodies of water and waterways that flow through or are located in the region. Estuaries, creeks, and built waterways are found throughout the region, as well as the dominant body of water, the San Francisco Bay, which reaches out to the northern and southernmost counties of the Bay Area. Most rivers and streams originating in each of the nine counties of the Bay Area flow into the San Francisco Bay, which provides access to the Pacific Ocean. There are also many smaller built reservoirs in the Bay Area that provide notable landscape features, as well as a few larger reservoirs, notably Lake Berryessa in Napa County and Lake Sonoma in Sonoma County.

Views from Travel Corridors

Many roadways and rail lines that intersect the landscapes of the Bay Area provide expansive, regional views of surrounding areas, often because of their wide rights-of-way, location along high points, the elevation of the facilities, or a combination of these factors. Examples include Interstate (I-) 280 along the peninsula, State Route (SR) 92 as it crosses the Coastal Ranges, I-80 near Rodeo, I-580 over the Altamont Pass and above Oakland, and the SR 24 corridor. Similarly, the rest area on I-80 above Vallejo, the west end of the Caldecott Tunnel, southbound US 101 in Marin County, and portions of US 101 in San Francisco offer dramatic views of notable Bay Area landscapes. The bridges crossing San Francisco Bay and the Carquinez Strait offer similar experiences. Both the Bay and Golden Gate Bridges provide world-famous views of San Francisco, whereas the Richmond-San Rafael Bridge provides sweeping views of the North Bay, including Mount Tamalpais and Angel Island. The Antioch Bridge allows views over the Sacramento–San Joaquin Delta.

Similarly, rail facilities (including Bay Area Rapid Transit [BART]) can provide travelers with broad views of the region or portions of it. The elevated BART lines through the East Bay, for example, provide views of the East Bay hills and the neighborhoods of Oakland, Berkeley, and El Cerrito. The Amtrak rail lines along San Pablo Bay and the San Joaquin River also provide broad views of the water with the hills beyond.

Roads and rail lines also provide more intimate views of forested hills or narrow valleys. SR 35 (along the crest of the San Mateo Peninsula) and SR 84 (through the narrows of Niles Canyon) are examples of such views. Similarly, SR 1 and Sir Francis Drake Boulevard run through the forests and grasslands of Marin

County to the beaches, parks, and open space areas along the coast, up to and through Sonoma County. SR 29 and the Silverado Trail through the Napa Valley, and SR 12 through the Sonoma Valley, provide dramatic views of enclosing hills, adjoining vineyards, and wineries.

Finally, although carrying only a small proportion of the region's travelers, the San Francisco Bay ferries provide unique viewing experiences of the Bay Area.

Views of Roads, Rail, and Buildings

Roads, buildings, and railways are also a part of the existing aesthetic landscape because the Bay Area contains a wide variety of densely populated metropolitan and urban centers along with more rural communities. Rural and natural landscapes can be dramatically altered by the placement of roads, rail lines, and buildings. Although roads and rail lines can provide access to views for travelers, these facilities can detract from or block public views. A new or expanded roadway along a hillside can be visible from a great distance, changing the impression of the hillside for the viewer, particularly if the hillside is undeveloped. Also, new roads and rail lines are sometimes built at elevations above the level of existing development, which can overshadow nearby homes and businesses and limit views of the surrounding hills and valleys. Similarly, buildings can enhance or detract from the overall visual environment depending on their design, location, and relationship to other structures and natural features.

3.2.2 Regulatory Setting

FEDERAL REGULATIONS

US Department of Transportation Act, Section 4(f)

The US Department of Transportation Act (DOT Act) (49 US Code Section 303) was enacted to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) of the DOT Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Highway Administration, Federal Transit Administration, and Federal Aviation Administration that involve the use, or interference with use, of the following types of land:

- public park lands;
- recreation areas;
- wildlife and waterfowl refuges; and
- publicly or privately owned historic properties of federal, state, or local significance.

This evaluation, called the Section 4(f) statement, must be sufficiently detailed to permit the US Secretary of Transportation to determine whether:

- there is no feasible and prudent alternative to the use of such land or
- the program includes all possible planning to minimize harm to any park, recreation area, wildlife and waterfowl refuge, or historic site that would result from the use of such lands.

If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary; or if there is no feasible and prudent alternative, the proposed project must include all possible planning to minimize harm to the affected lands.

Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.

In August 2005, Section 4(f) was amended to simplify the process for approval of projects that have only minimal impacts on lands affected by Section 4(f). Under the new provisions, the US Secretary of Transportation may find such a minimal impact if consultation with the State Historic Preservation Officer results in a determination that a transportation project would have no adverse effect on a historic site or that no historic properties would be affected by the proposed action. In that instance, analysis of avoidance alternatives is not required, and the Section 4(f) evaluation process is complete.

STATE REGULATIONS

California Scenic Highway Program

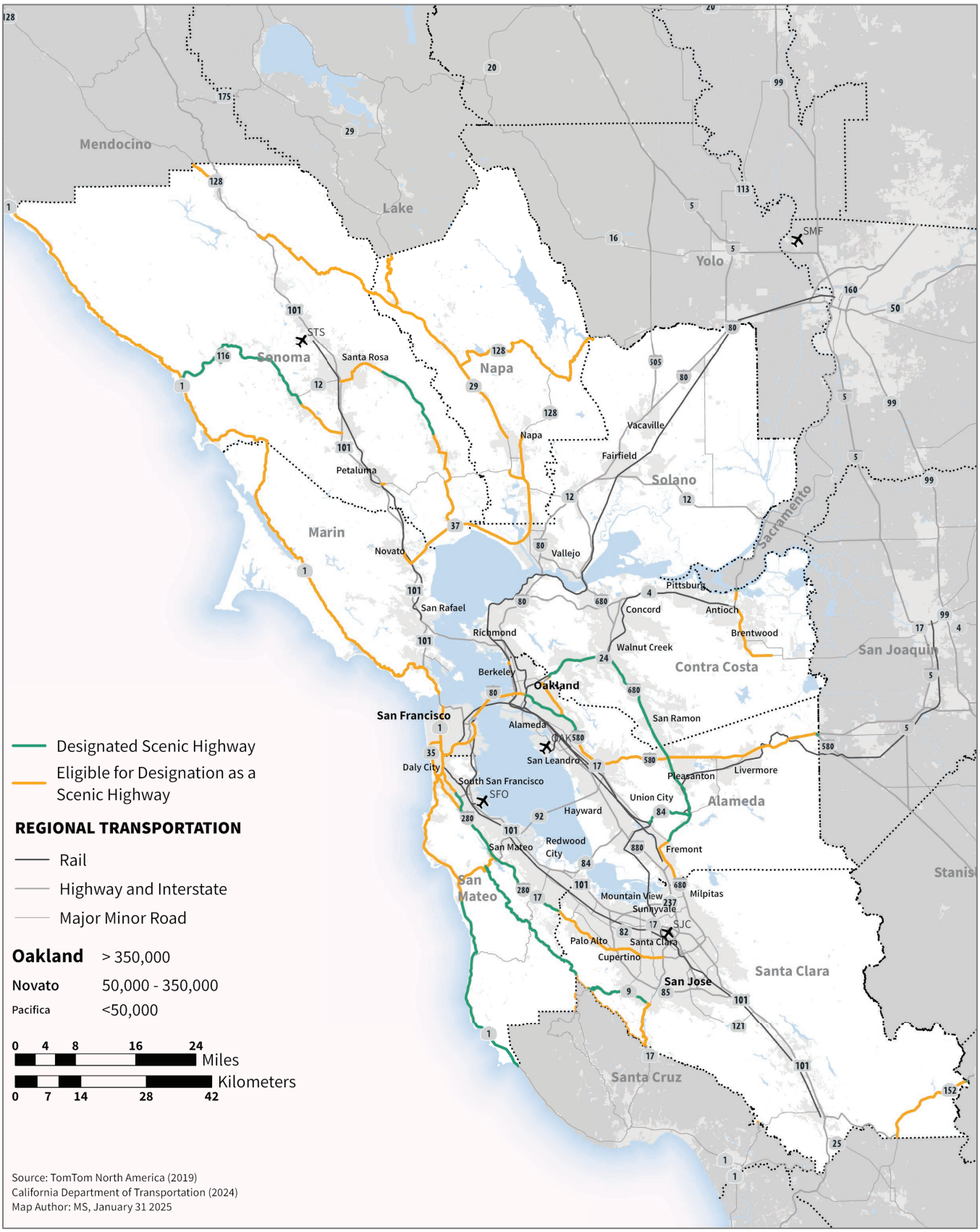
Recognizing the value of scenic areas and views from roads in such areas, the state legislature established the California Scenic Highway Program in 1963 and is managed by the California Department of Transportation (Caltrans). This legislation preserves and protects scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The goal of the Scenic Highway Program is to preserve and enhance the natural beauty of California. Under this program, portions of a number of state highways have been designated as eligible for inclusion as scenic routes. To nominate a scenic highway, the local jurisdictions through which the roadway passes must conduct a visual assessment, submit a Scenic Highway Proposal, and prepare and adopt a corridor protection program (CPP). After Caltrans and the Scenic Highway Program coordinators review the nomination and recommend designation of the roadway, the State may officially designate roadways as scenic routes. Interstate highways, state highways, and county roads may be designated as scenic under the program (Caltrans 2025a).

As noted, a CPP must be adopted by the local governments with land use jurisdiction over the area through which the roadway passes as the first step in moving a road from “eligible” to “designated” status. Each designated corridor is monitored by the state, and designation may be revoked if a local government fails to enforce the provisions of the corridor protection program. Although there are no restrictions on scenic highway projects, local agencies and Caltrans must work together to coordinate transportation and development projects and ensure the protection of the corridor’s scenic value to the greatest extent possible, including undergrounding all visible electric distribution and communication utilities within 1,000 feet of a scenic highway. In some cases, local governments have their own land use and site planning regulations in place to protect scenic values along a designated corridor. At a minimum, each corridor protection program must include:

- regulation of land use and density of development,
- detailed land and site planning,
- control of outdoor advertising devices,
- control of earthmoving and landscaping, and
- regulation of the design and appearance of structures and equipment.

The Bay Area includes numerous designated or eligible state scenic highways. Officially designated state scenic highways are illustrated in **Figure 3.2-2**. All officially designated and eligible state scenic highways in the Bay Area are listed in **Table 3.2-1**.

Figure 3.2-2: State-Designated and Eligible Scenic Highways



Sources: TomTom North America 2019; Caltrans 2024.

Table 3.2-1: California State Scenic Highway System Officially Designated and Eligible Routes in the Bay Area

Designation	Route	County	Location
OD	1	San Mateo	Santa Cruz County line to southern city limit of Half Moon Bay
OD	9	Santa Clara	Santa Cruz County line/Saratoga Gap to Blaney Plaza in Saratoga
OD	9	Santa Clara	Blaney Plaza in Saratoga to Los Gatos city limit
OD	12	Sonoma	Danielli Avenue east of Santa Rosa to London Way north of Agua Caliente
OD	24	Contra Costa	East portal of Caldecott Tunnel to I-680 north of Walnut Creek
OD	35	San Mateo	Santa Cruz County line to Santa Clara County line
OD	35	San Mateo	Santa Clara County line to SR 92 in Half Moon Bay
OD	84	Alameda	SR 238 (Mission Boulevard) to I-680 near Sunol
OD	116	Sonoma	SR 1 to southern city limit of Sebastopol
OD	280	San Mateo	Santa Clara County line to northern city limit of San Bruno
OD	580	Alameda	San Joaquin County line to SR 205
OD	580	Alameda	San Leandro city limit to SR 24 in Oakland
OD	680	Alameda	Mission Boulevard in Fremont to Bernal Avenue near Pleasanton
OD	680	Alameda	Bernal Avenue near Pleasanton to Contra Costa County line
OD	680	Contra Costa	Alameda County line to SR 24
E	1	Marin/ Sonoma/Mendocino	SR 101 near Marin City to SR 101 near Leggett
E	1	San Francisco	SR 35 in San Francisco to SR 101 near Golden Gate Bridge in San Francisco
E	1	San Luis Obispo/San Mateo/ San Francisco	SR 101 near San Luis Obispo to SR 35 near Daly City
E	4	Contra Costa	SR 160 near Antioch to SR 84 near Brentwood
E	9	Santa Clara	SR 35 to SR 17 near Los Gatos
E	12	Sonoma	SR 101 near Santa Rosa to SR 121 near Sonoma
E	13	Alameda	SR 24 to I-580
E	17	Santa Cruz/Santa Clara	SR 1 near Santa Cruz to SR 9 near Los Gatos
E	24	Contra Costa	Alameda/Contra Costa County line to I-680 in Walnut Creek
E	29	Napa/Lake	Trancas Street in Napa to SR 20 near Upper Lake
E	29	Solano/Napa	SR 37 near Vallejo to SR 221 near Napa
E	35	Santa Clara/Santa Cruz/ San Mateo/San Francisco	SR 17 to SR 92/I-280/SR 1 in San Francisco
E	37	Marin	SR 251 near Nicasio to SR 101 near Novato
E	37	Marin/ Sonoma/Solano	SR 101 near Ignacio to SR 29 near Vallejo

Designation	Route	County	Location
E	80	San Francisco/Alameda	I-280 near First Street in San Francisco to SR 61 in Oakland
E	84	Alameda	SR 238 to I-680 near Sunol
E	92	San Mateo	SR 1 north of Half Moon Bay to I-280 north of Crystal Springs Lake
E	101	Marin	North of San Francisco across the Golden Gate Bridge to SR 1 in Marin City
E	101	Marin	SR 37 near Ignacio to SR 37 near Novato
E	116	Sonoma	SR 1 near Jenner to SR 101 near Cotati
E	121	Napa	SR 221 near Napa State Hospital to near Trancas Street in Napa
E	121	Sonoma	SR 37 near Sears Point to SR 12 near Sonoma
E	152	Santa Clara/Merced	SR 156 near San Felipe to I-5
E	156	Monterey/San Benito/Santa Clara	SR 1 near Castroville to SR 152 northeast of Hollister
E	160	Contra Costa/Sacramento	SR 4 near Antioch to Sacramento
E	221	Napa	SR 29 at Suscol Road to SR 121 in Napa
E	239	Alameda/Contra Costa	I-580 west of Tracy to SR 4 near Brentwood
E	251	Marin	SR 37 near Nicasio to SR 1 near Point Reyes
E	280	Santa Clara/San Mateo/ San Francisco	SR 17 to I-80 near First Street in San Francisco
E	580	San Joaquin/Alameda	I-5 southwest of Vernalis to I-80
E	680	Alameda/Contra Costa	Santa Clara County line to SR 24 in Walnut Creek

Notes: E = eligible; OD = officially designated; I- = Interstate; SR = State Route.
Source: Caltrans 2025b.

Open Space Easement Act of 1974

Cities and counties can use open space easements as a mechanism to preserve scenic resources if they have adopted open space plans, as provided by the Open Space Easement Act of 1974 (Government Code, Sections 51070, 51097). According to this act, a city or county may acquire or approve an open space easement through a variety of means, including use of public money. By utilizing open space easements, cities and counties are able to effectively protect and preserve scenic resources and maintain valuable open spaces.

California Code of Regulations Title 24 Part 6

The California Energy Code (24 CCR 6) creates standards in an effort to reduce energy consumption and enhance energy efficiency across various sectors. The type of luminaries and the allowable wattage of certain outdoor lighting applications are regulated. Title 26 promotes lighting designs that limit light pollution and reduce light trespass—preventing light from spilling over onto neighboring properties or into the night sky, which is critical for areas near scenic highways, parks, or residential neighborhoods.

Senate Bill 743 (Statutes of 2013)

Senate Bill 743 provides that aesthetics impacts of a residential, mixed-use residential, or employment center project on an infill site are not considered significant environment impacts if three criteria are met: (1) the project is in a Transit Priority Area (TPA); (2) the project is on an infill site; and (3) the project is residential, mixed-use residential, or an employment center. These statutes are included in CEQA (PRC Section 21099).

REGIONAL AND LOCAL REGULATIONS

City and County General Plans

City and county general plans may include policies for protecting scenic resources, such as hillsides, natural areas, landmarks, roads, and historic districts. Such policies may restrict new development in areas that maintain scenic vistas or areas that contain important character-defining structures. Additionally, design guidelines established at the local level may establish specific standards for addressing development where local character and/or important visual resources may be affected.

Counties and municipalities also may have scenic route components within their individual general plans. Policies usually encourage the designation of scenic routes as scenic corridors, either by local action or through the state program. Counties and municipalities may also establish regulatory programs or recommend corridor studies to determine the appropriate regulatory program to preserve scenic quality.

Issues pertaining to visual resources are typically addressed in the land use elements of general plans, but policies can also be found in the conservation and open space elements. The General Plan Guidelines, prepared by the California Governor's Office of Land Use and Climate Innovation (formerly known as California Governor's Office of Planning and Research), recommend that the land use element address an inventory of scenic viewsheds and points of interest, definition of community scenic values, programs for protecting and promoting community aesthetics, and identification of scenic highways and byways (LCI 2017).

3.2.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- have a substantial adverse effect on a scenic vista (Criterion AES-1);
- substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway (Criterion AES-2);
- in nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings and in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality. (Criterion AES-3); or
- create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (Criterion AES-4).

METHOD OF ANALYSIS

Pursuant to PRC Section 21099, aesthetic impacts of residential, mixed-use residential, or employment center projects located within TPAs are not considered significant environmental impacts. This program-level EIR evaluates potential impacts on visual resources based on the location of the footprints associated with the forecasted development pattern (i.e., land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of visual resources throughout the Bay Area. A brief description of typical views found within the plan area is provided above in the environmental

setting. These typical views are the basis of the impact analysis, and the visual resources baseline. The baseline for the following analysis is the date of the EIR Notice of Preparation release in January of 2025.

The proposed plan includes different types of transportation projects that could have varied effects on the aesthetic environment. This analysis examines categories of transportation investments for likely impacts. Similarly, future development projects in the land use growth footprint, sea level rise adaptation projects, and transportation projects footprint would vary in size and appearance. Generally, with regard to aesthetic impacts, the greater the change from existing conditions, the more noticeable the change to the aesthetic environment. For example, greenfield development when discussing land use growth footprint usually has a greater visual impact on the surrounding area than infill development that occurs where similar land uses already exist or where long-range views are limited by existing development. Although specific design details and the exact footprint of the sea level rise adaptation projects have not yet been finalized due to their early planning stage, the projects are expected to result in minimal aesthetic impacts under CEQA. This is primarily because sea level rise adaptation projects—such as levees, seawalls, elevated roadways, marsh restoration, and tidal gates—can be integrated into the existing visual character of the area through careful siting, contouring, and use of native vegetation. In addition, these features are generally low-profile and can be designed to blend with the surrounding landscape, maintaining scenic views and minimizing visual intrusion. For transportation projects, the construction of a new roadway generally has a greater impact on scenic resources than the widening of an existing one.

The general approach in this impact analysis is to characterize how implementation of the proposed plan could potentially change the aesthetic environment from existing conditions and whether that change would have a potentially significant adverse effect based on the significance criteria. Construction effects related to construction equipment and activity are assumed to be temporary with regard to changes in the visual environment.

IMPACTS AND MITIGATION MEASURES

Impact AES-1: Have a substantial adverse effect on a scenic vista (PS)

Land Use Impacts

Effects on scenic vistas associated with changes in land use would relate to changes to views of important landscape features, such as the Golden Gate Bridge, or landforms, such as mountains, which would be experienced regionally. This type of impact would occur as a result of construction and operation of projects that would directly alter a feature or be placed in a location such that the intensity and height of development would obscure views.

Construction

Construction activities in the Bay Area are common, particularly in the urban areas. The presence of construction equipment may cause changes to the existing physical environment by introducing elements that may be seen as visually intrusive (e.g., cranes, backhoes, staging areas, and stockpiling of materials). The use of cranes, backhoes, staging areas, and stockpiling of materials during construction related activities could temporarily affect views of a scenic vista. However, the presence of construction equipment would be temporary and would be removed following construction; therefore, construction would not result in a significant impact to scenic vistas (LTS).

Operation

The proposed plan includes strategies that address protection of open space lands and concentration of development within already developed areas. Specifically, Strategy EN4 directs new growth to be located within the region's existing urban footprint or growth boundaries. This strategy would confine new

development within areas of existing development and areas that are suitable for growth, as established by local jurisdictions. Strategy EN5 would protect and preserve high-priority natural and working lands, which would improve the resilience and connectivity of the region's biodiversity and the sustainability and vibrance of the agriculture sector. Implementation of Strategies EN4 and EN5 would protect existing scenic resources, including scenic views, located within open space lands and agricultural lands. Therefore, these areas are not expected to be subject to proposed plan-related development.

As summarized in **Table 2-4**, urbanization—growth on land not designated as urban built-up land as defined by California's Department of Conservation through the Farmland Mapping and Monitoring Program (FMMP)—is forecasted to occur on approximately 8,093 acres, or 23% of the land use growth footprint. The remaining 77% of the land use growth footprint would be within land designated as urban built-up—which FMMP defines as "land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel"—reflective of the proposed plan's core focused growth approach to leverage existing infrastructure. This indicates that development and redevelopment would occur almost entirely within existing urban built-up lands. Therefore, scenic vistas in the region would remain similar to the existing conditions. That is, long-range scenic vistas would not be substantially altered because landforms and areas of development would be similar to the existing conditions.

The potential to affect scenic vistas is related to the specific vantage point of a viewer and the types of development that currently exist. Important public views are protected based on locally adopted land use policies and/or regulations. Future development projects would be subject to the requirements of local policies and regulations. As required under Government Code Section 65302, all jurisdictions are assumed to have policies and regulations in place (e.g., general plan) that protect scenic resources, which can include scenic vistas identified to be important within the jurisdiction. However, denser or more compact development in the proposed plan's Growth Geographies may block panoramic views or views of landscape features or landforms from public and individual properties because increasing densities on existing footprints could result in taller buildings and/or buildings placed more closely together. Therefore, depending on the location of the viewer, scenic vistas may be substantially altered, and short-range impacts on views of scenic vistas would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction

Implementation of sea level rise adaptation projects could result in development of features such as levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Construction-related activities such as cranes, backhoes, staging areas, and stockpiling of materials could temporarily affect views of a scenic vista. As discussed above under land use impacts, the presence of construction equipment could temporarily affect views of a scenic vista. However, the presence of construction equipment would be temporary, and the equipment would be removed following construction. Therefore, construction would result in a less-than-significant impact to scenic vistas (LTS).

Operation

Development of sea level rise adaptation projects, such as horizontal levees, marsh restoration, seawalls, and tidal gates, are unlikely to block or substantially alter views of scenic vistas because these types of structures would be located low to the ground and would not be of substantial height. However, development of sea level rise adaptation projects, such as vertical levees and elevated roadways and rail, could be tall enough to alter views of scenic vistas. Therefore, depending on the location of the viewer, scenic vistas may be substantially altered, and impacts on views of scenic vistas would be potentially significant (PS).

Transportation System Impacts

Implementation of the proposed plan would include a variety of major transportation projects such as improvements to interchanges and highway widenings, local roadway widenings, new bike lanes and/or multiuse paths, and increased transit frequency and capacity. Transportation projects would generally be located within densely populated areas that are currently used as existing travel routes (see **Figure 2-4** in Chapter 2, "Project Description"). Not all transportation projects in the proposed plan would result in substantial construction or operational impacts. For example, projects that involve transit route improvements, road operations and maintenance, and pedestrian and bicycle improvements would not result in physical changes to the environment.

Major transportation projects included in the proposed plan that would alter approximately 8,577 acres are associated with the following strategies:

- Strategy T6, "Modernize Freeways and Interchanges";
- Strategy T7," Expand Freeways and Mitigate Impacts";
- Strategy T8, "Advance Other Regional Programs and Local Priorities";
- Strategy T11, "Enhance Transit Frequency, Capacity, and Reliability"; and
- Strategy T12, "Expand Transit Services throughout the Region."

These major transportation projects may include development of new travel lanes on freeways, expressways, and highways or by constructing new rail, ferry, and bus rapid transit routes and stations, which are common throughout the region.

Construction

Construction of transportation projects included in the proposed plan could take several months to several years and have the potential to result in long-term effects on scenic views from discrete locations depending on the size of projects. As discussed above for land use projects, construction of projects could directly alter a feature or be placed in a location such that the intensity and height of development would obstruct views. Transportation projects included in the proposed plan could require the removal of landscaping, temporary traffic changes, temporary signage, and construction staging areas. Larger projects, such as expansion of regional transit lines, and construction of train stations and parking structure could take long periods of time (e.g., several years) to complete, require substantial grading activities, and the prolonged presence of construction equipment and stockpiling of materials. As shown in **Figure 2-4** (see Chapter 2, "Project Description"), transportation projects are clustered in Santa Clara County around the densely populated areas of Santa Clara, downtown San Jose, and Milpitas; in central and western Alameda County; in San Mateo County around the City of San Mateo and South San Francisco and Contra Costa County around the City of Richmond. Due to the size and duration of some projects, construction may result in significant temporary impacts to scenic vistas (PS).

Operation

Upon completion, the extent to which there would be impacts on scenic vistas from new transportation projects would depend on the type of project and its location relative to specific vantage point of viewers. For example, bicycle and pedestrian projects, such as sidewalk and roadway striping, are unlikely to have adverse impacts on scenic vistas because these types of projects would not require earth moving activities that would result in physical changes to the environment. Many of the other major transportation projects would not substantially alter the Bay Area at a regional scale such that scenic views could be substantially altered because the expected appearance of arterials, highways, and local and regional transit systems would remain generally the same at a regional scale as under the existing conditions. However, new features such as new travel lanes or rail lines, large signs, new intersections, and new stations could be placed in a location such that the intensity and height of development may block public views of landscape features or landforms.

Therefore, scenic vistas could be substantially altered because of new transportation infrastructure. This impact would be potentially significant (PS).

Conclusion

As discussed above, future development and infrastructure associated with the proposed plan's land use growth, sea level rise adaptation projects, and transportation projects footprints would not substantially change long-range views of scenic vistas in the Bay Area because long-range views of landforms and man-made features would remain similar to the existing conditions. However, impacts to scenic vistas would be substantial from discrete locations because of the introduction of new features or obstruction of views in a localized viewshed. Therefore, impacts on scenic views would be **potentially significant (PS)**. Mitigation Measure AES-1 addresses this impact and is described below.

Mitigation Measure

Mitigation Measure AES-1: Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Reduce the visibility of construction staging areas by fencing and screening these areas with low contrast materials consistent with the surrounding environment, and by revegetating graded slopes and exposed earth surfaces at the earliest opportunity.
- Site or design projects to minimize their intrusion into important viewsheds. Measures to achieve this could include, but are not limited to, requiring that the scale and massing of new development in higher-density areas provide appropriate transitions in building height and bulk that are sensitive to the physical and visual character of adjoining neighborhoods that have lower development intensities and building heights, and ensuring building heights are stepped back from sensitive adjoining uses to maintain appropriate transitions in scale and to protect scenic vistas and scenic resources.
- Design projects to minimize the potential to obscure, detract from, or negatively affect the quality of views from state-designated scenic roadways or scenic highways.
- Use see-through safety barrier designs (e.g., railings rather than walls).
- Develop interchanges and transit lines at the grade of the surrounding land to limit view blockage.
- Where highway screening is a required element of a development, design landscaping along all highways, including state-designated scenic highways, locally designated scenic highways, and highway corridors in rural and open space areas to add natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur. Retain or replace trees bordering highways so that clear-cutting is not evident.
- Identify, preserve, and enhance scenic vistas to and from hillside areas and other visual resources.

Significance after Mitigation

Mitigation Measure AES-1 would reduce significant impacts to scenic vistas because it would modify site design and provide development recommendations that would minimize visual intrusion on important viewsheds. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, because site conditions are unique, it cannot be concluded with certainty that all significant viewshed impacts could be avoided. Therefore, there may still be instances in which viewshed impacts are substantially altered. This impact would remain **significant and unavoidable (SU)**.

Impact AES-2: Substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway (PS)

Land Use Impacts

Scenic resources that contribute to the visual character of scenic highways are, by nature, specific to their local context, and as such, impacts on these resources resulting from the development assumed as a part of the proposed plan would occur at the local level. As shown in **Figure 3.2-2**, there are substantial stretches of roadways in the Bay Area that are designated as scenic highways or eligible for designation. The proposed plan assumes that housing and employment growth in the region would occur primarily in existing urban areas, some of which are adjacent to designated and eligible scenic highways.

Construction

Development adjacent to scenic highways could cause short-term visual impacts resulting from construction equipment and scaffolding, temporary lighting, and exposed excavation and slope faces. In general, construction-related impacts to scenic highways would be the same as those under Impact AES-1 relating to the blockage of views. Large projects are most likely to have significant impacts on scenic highways, but small projects could have substantial impacts depending on their duration. Generally, construction impacts would be less than significant because of their temporary nature; however, as noted, large or long duration projects could have significant impacts (PS).

Operation

The potential for visual impacts on scenic highways would result from dense, compact development projects located in less urbanized areas, and adjacent to scenic highways, which could damage scenic resources or create visual contrast between the project and existing conditions. The Scenic Highway Program managed by Caltrans to protect scenic highway corridors includes certain limits on land uses adjacent to the roadway, which are implemented at the local level. When nominating a scenic highway, Caltrans requires that the nominating agency adopt a CPP that includes regulation of land use and density of development; detailed land and site planning; control of outdoor advertising; careful attention to and control of earthmoving and landscaping; and the design and appearance of structures and equipment. These programs are included as part of the scenic highway designation, and Caltrans can revoke the designation if these programs are not followed. Cities and counties also have policies (e.g., general plan), regulations (e.g., zoning), and other guidance (e.g., design guidelines) that control the size and scale of new development to maintain visual compatibility with the natural and built environments. However, development adjacent to scenic highways could result in short-term and long-term impacts on resources along scenic highways. This impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction and Operation

The implementation of sea level rise adaptation projects could result in the development of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. These adaptation projects would be clustered in Sonoma County, followed by Marin, San Mateo, Alameda, Solano, and Santa Clara Counties. Sea level rise adaptation projects would be minimal in Contra Costa, Napa, and San Francisco Counties. As explained above, the presence of construction equipment would be temporary and would be removed following construction. Grading and earthwork for construction of adaptation projects such as horizontal levees, marsh restoration, seawalls, tidal gates, vertical levees, and elevated roadways and rail could result in the removal of trees and other vegetation and topographic disturbance. As noted above, the Scenic Highway Program managed by Caltrans to protect scenic highway corridors includes certain limits on land uses adjacent to the roadway, which would be implemented at the local level. When nominating a scenic highway, Caltrans requires that the nominating agency adopt a CPP that includes regulation of land use and

density of development; detailed land and site planning; control of outdoor advertising; careful attention to and control of earthmoving and landscaping; and the design and appearance of structures and equipment. These programs are included as part of the scenic highway designation, and Caltrans can revoke the designation if these programs are not followed. Additionally, cities and counties have policies (e.g., general plan), regulations (e.g., zoning), and other guidance (e.g., design guidelines) that control the size and scale of new infrastructure to maintain visual compatibility with the natural and built environments. However, infrastructure placement adjacent to scenic highways could result in short-term and long-term impacts on resources along scenic highways. This impact would be potentially significant (PS).

Transportation System Impacts

Construction and Operation

Scenic resources that contribute to the visual character of scenic highways are, by nature, specific to their local context, and as such, impacts on these resources resulting from the transportation projects assumed as a part of the proposed plan would occur at the local level. Many of the transportation projects in the proposed plan would involve transit route improvements, road operations and maintenance, and pedestrian and bicycle improvements, which would all involve minimal construction. However, major capital improvement projects that would introduce new structures or facilities have the potential to result in substantial visual impacts during construction. Construction of such projects could take several months to several years.

Proposed transportation projects could impact portions of Bay Area highways that are designated as state scenic highways or that are eligible scenic highways. These projects could have adverse effects on the visual character of land adjacent to designated scenic highways or highways eligible for designation. Transportation projects subject to review by the Federal Transit Administration, Federal Railroad Administration, or Federal Highway Administration would be subject to National Environmental Policy Act (NEPA) review and compliance with guidance related to visual resources such as the Federal Highway Administration (FHWA) Guidelines for the Visual Impact Assessment of Highway Projects (FHWA 2015). Therefore, because existing regulations would protect resources along scenic highways, impacts would be less than significant after construction. However, because substantial visual impacts may occur during construction and because construction of some projects may take years, this impact is potentially significant (PS).

Conclusion

As discussed above, because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to affect visual resources within a state scenic highway, impacts on resources along scenic highways would be **potentially significant (PS)**. Mitigation Measure AES-2 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AES-2: Implement Mitigation Measure AES-1.

Significance after Mitigation

Mitigation Measure AES-2 would reduce significant impacts on visual resources within a state-designated scenic highway because it involves modifying site design and providing development recommendations that would minimize visual intrusion. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, because site conditions are unique, it cannot be concluded with certainty that all significant visual resource impacts could be avoided. Therefore, there may still be instances in which visual resources along state-designated scenic highways are substantially altered. This impact would remain **significant and unavoidable (SU)**.

Impact AES-3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings and in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality (PS)

Land Use Impacts

Construction and Operation

The proposed plan's forecasted development pattern accommodates the people, households, and jobs identified in the regional growth forecast. The land use growth footprint resulting from the proposed plan could cause substantial visual impacts by creating or increasing contrasts with the visual character of an existing community. At the regional scale, the greatest impacts would result from high density residential development and high intensity nonresidential projects located within existing communities where the visual contrast between the project and existing conditions would be the most apparent. Development outside of urban built-up lands could introduce dense compact development that would contrast with the existing character of the community. However, as summarized in **Table 2-4** (see Chapter 2, "Project Description") development and redevelopment would occur predominately within areas that are currently designated as urban built-up lands. In many cases, the existing visual character within urban built-up lands would not be substantially altered because dense compact development would be similar to existing conditions. Implementation of the proposed plan's land use growth footprint could cause substantial localized visual impacts by disrupting the local character of the built environment if new development intensity, densities, and heights are substantially higher than existing development. Local standards and design guidelines (discussed below) would ultimately be the primary tools in shaping neighborhood character.

In growth areas where density, intensity, and heights are anticipated to increase substantially, new development—and in some cases, new types of development—would be required to accommodate forecasted regional growth (see **Figures 2-3 and 2-5** in Chapter 2, "Project Description"). Development resulting from the proposed plan could cast shadows that would substantially degrade the existing visual/aesthetic character or quality of a public place for a sustained period of time. This type of impact would be a tradeoff resulting from increased density and intensity of development in these areas, and is controlled and regulated through local regulations and design review.

As required under state law, all cities and counties have policies (e.g., general plan), regulations (e.g., zoning), and other guidance (e.g., design guidelines) that control the size and scale of new development, which serves to maintain its visual compatibility with the natural and built environments. Local jurisdictions maintain land use and design control over discretionary development projects and would be responsible for approving development plans. Local land use agencies are ultimately responsible for the approval of future urban development and would apply development standards and guidelines to maintain compatibility with existing communities, including site coverage, building height and massing, building materials and color, landscaping, and site grading in visually sensitive areas. However, implementation of the proposed plan would increase density and intensity of growth in designated Growth Geographies to a level greater than currently planned, particularly in less urbanized areas. Therefore, the potential for impacts to visual character and quality is considered potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction

Implementation of sea level rise adaptation projects could result in the construction of actions such as levees, seawalls, elevated roadways, marsh restoration, and tidal gates. These projects would be

clustered primarily in Sonoma County, followed by Marin, San Mateo, Alameda, Solano, and Santa Clara Counties. Sea level rise adaptation projects would be minimal in Contra Costa, Napa, and San Francisco Counties. Sea level rise adaptation projects would occur primarily in nonurbanized areas but could be located in areas subject to public views where viewer sensitivity is high. As explained above, grading and earthwork for construction of adaptation projects could result in the removal of trees and other vegetation and topographic disturbance, which would alter the existing character of the project sites. Therefore, this impact would be potentially significant (PS).

Operation

Development of sea level adaptation projects, such as horizontal levees, marsh restoration, seawalls, and tidal gates, are unlikely to substantially degrade visual quality because these types of structures would be located low to the ground and would not be of significant height. However, development of sea level adaptation projects, such as vertical levees and elevated roadways and rail, could require greater tree removal or earthwork and could alter or degrade existing visual quality in the region depending on their location by introducing new built elements in existing natural landscapes or increasing the vertical profile of existing infrastructure. Therefore, the potential for impacts to visual character and quality is considered potentially significant (PS).

Transportation System Impacts

Construction and Operation

The plan area includes a complex system of roadways and public transit that accommodates existing users. Roadway maintenance and roadway- and transit-related construction activities are common throughout the plan area. As noted above, implementation of the proposed plan would include major transportation projects that would include a variety of transportation modifications such as new express lanes, roadway widening, increased transit service and expansion, and other maintenance and rehabilitation projects. Generally, these projects would be located within areas that are currently used as existing travel routes. The majority of the transportation projects in the proposed plan include operations, maintenance, minor rehabilitation, signal and signage improvements, and local arterial projects and would not result in substantial changes in visual character. However, development of major above-ground transportation projects could result in substantial effects on the visual character in the region depending on their location and project type. As shown in **Figure 2-4** (see Chapter 2, “Project Description”), new transportation projects span eight of the nine plan area counties but are especially clustered in Santa Clara County around the densely-populated areas of Santa Clara, Downtown San Jose, and Milpitas; in central and western Alameda County; in San Mateo County around the City of San Mateo and South San Francisco and Contra Costa County around the City of Richmond. Substantial regional projects that would add travel lanes to freeways, expressways, highways, or add new routes to fixed guideway transit facilities and would be located in already developed areas and would not constitute a significant change in visual character. However, the proposed plan’s transportation projects that extend into non-urban areas or that expand existing rights-of-way could impact community character by increasing visual contrast within the community. Therefore, implementation of the proposed plan’s major transportation projects would constitute a potentially significant impact (PS).

Conclusion

As discussed above, implementation of the proposed plan’s forecasted development pattern, sea level rise adaptation projects, and transportation projects has the potential to produce significant impacts because changes could alter the visual character of a site. Impacts would be **potentially significant (PS).** Mitigation Measure AES-3 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AES-3: Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Require that the scale, massing, and design of new development provide appropriate transitions in building height, bulk, and architectural style that are sensitive to the physical and visual character of surrounding areas.
- Contour the edges of major cut and fill slopes to provide a finished profile that is appropriate to the surrounding context, using shapes, textures, colors, and scale to minimize contrasts between the project and surrounding areas.
- Require project sponsors to conduct shadow studies for four-story high (and higher) buildings and roadway facilities to identify and implement development strategies for reducing the impact of shadows on public open space, where feasible. Study considerations shall include, but are not limited to, the placement, massing, and height of structures, surrounding land uses, time of day and seasonal variation, and reflectivity of materials. Study recommendations for reducing shadow impacts shall be incorporated into the project design as feasible based on project- and site-specific considerations.

Significance after Mitigation

Mitigation Measure AES-3 would reduce significant impacts to visual character or quality because it would modify site design and provide development recommendations that would result in projects that would be consistent in appearance to their surroundings. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, because site conditions are unique within urban and non-urban areas, it cannot be concluded with certainty that all significant impacts to existing visual character could be avoided. Therefore, there may still be instances in which impacts to visual character are **significant and unavoidable (SU)**.

Impact AES-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (PS)

Land Use Impacts

Construction and Operation

Implementation of the proposed plan would result in the development of new residential or commercial structures that could create new sources of light and glare from the introduction and addition of indoor and outdoor lighting in new or redeveloped residential and nonresidential buildings located in the land use growth footprint. These new structures could result in substantial sources of light at the regional scale that cause a public hazard, disrupt scenic vistas, and brighten the night sky. In portions of the region designated as urban built-up land, increases would not degrade the visual character or quality of the area because existing sources of glare and light are already a dominant feature of the landscape.

Development projects resulting from the proposed plan could create new substantial sources of light and glare at the local scale. In addition, the introduction of new sources of light and glare could impact local visual resources by altering the local character of the built environment. High density residential and high intensity nonresidential development, in particular, could have substantial increases in light and glare at the local level. Overall, the impact of new sources of light and glare would be less than significant (LTS) in urban areas and potentially significant (PS) in rural areas.

Sea Level Rise Adaptation Impacts

Construction and Operation

Implementation of sea level rise adaptation projects could result in the construction of features such as levees, seawalls, elevated roadways, marsh restoration, and tidal gates. This infrastructure would be clustered in Sonoma County, followed by Marin, San Mateo, Alameda, Solano, and Santa Clara Counties. Sea level rise adaptation projects would be minimal in Contra Costa, Napa, and San Francisco Counties. Projects that would involve construction of levees, marsh restoration projects, and tidal gates could include limited lighting necessary for infrastructure maintenance, but would not introduce major new sources of light. The elevation of existing roadways would include similar sources of light as under existing conditions, and the projects would not introduce new sources of light or glare. Therefore, this impact would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

It is not anticipated that transportation projects would substantially increase the amount of light and glare, because most improvements would take place on existing facilities that have existing sources of light and glare (see **Figures 2-3 through 2-5** in Chapter 2, "Project Description"). Transportation projects could result in marginal increases in light and glare from additional vehicle headlights, new reflective signage, new streetlights, new intersection control devices, and other lighting ancillary to transportation projects. As shown in **Figure 2-4** (see Chapter 2, "Project Description"), transportation projects are clustered in Santa Clara County around the densely populated areas of Santa Clara, downtown San Jose, and Milpitas; in central and western Alameda County; in San Mateo County around the City of San Mateo and South San Francisco, and in Contra Costa County around the City of Richmond. Therefore, transportation projects that would introduce new sources of light and glare within urban areas would be similar in character to existing light sources. However, transportation projects located within rural areas could introduce light and glare to areas where no sources existed previously, which would constitute a potentially significant impact (PS).

Conclusion

As discussed above, implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects has the potential to introduce substantial new sources of light and glare. This impact would be **potentially significant (PS)**, primarily in rural areas. Mitigation Measure AES-4 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AES-4: Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Design projects to minimize light and glare from lights, buildings, and roadways facilities.
- Minimize and control glare from transportation projects through the adoption of project design features that reduce glare. These features include:
  - planting trees along transportation corridors to reduce glare from the sun;
  - landscaping off-street parking areas, loading areas, and service areas; and
  - shielding transportation lighting fixtures to minimize off-site light trespass.
- Minimize and control glare from land use and transportation projects through the adoption of project design features that reduce glare. These features include:

- limiting the use of reflective materials, such as metal;
- using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry;
- screening parking areas by using vegetation or trees; and
- using low-reflective glass.

- Impose lighting standards that ensure that minimum safety and security needs are addressed and minimize light trespass and glare associated with land use development. These standards include the following:
  - minimizing incidental spillover of light onto adjacent private properties and undeveloped open space;
  - directing luminaries away from habitat and open space areas adjacent to the project site;
  - installing luminaries that provide good color rendering and natural light qualities; and
  - minimizing the potential for sky glow into the nighttime sky and for incidental spillover of light onto adjacent private properties and undeveloped open space.

Significance after Mitigation

Mitigation Measure AES-4 would reduce significant impacts from light and glare because it would result in the modification of site design and would provide standards that would minimize the effects of light and glare. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact would be less than significant with mitigation (LTS-M). Projects taking advantage of CEQA Streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact remains **significant and unavoidable (SU)** for purposes of this program level analysis.

3.3 AGRICULTURE AND FORESTRY RESOURCES

3.3.1 Introduction

This section evaluates the potential effects of the proposed plan on agriculture and forestry land uses in the Bay Area. It describes trends in land use and physical development regarding agriculture and forestry lands. The impact analysis addresses the potential for physical disruption to agricultural lands or forestlands.

No comments received in response to the Notice of Preparation are related to agriculture and forestry resources.

Consistency with natural community conservation plans and habitat conservation plans is addressed in Section 3.5, "Biological Resources." Consistency with open space protection plans and policies is addressed in Section 3.11, "Land Use, Population, and Housing." Potential impacts on open space parks and recreation are described in Section 3.13, "Public Services and Recreation."

3.3.2 Environmental Setting

PHYSICAL SETTING

Land Use Patterns

The pattern of land uses in the Bay Area includes a mix of open space, agriculture, developed urban centers, a variety of suburban commercial and residential areas, and scattered older towns. This pattern reflects the landforms that physically define the region: the bay, rivers, and valleys. The land uses surrounding the bay margins tend to be more intensely developed, particularly from San Francisco south along the peninsula to Santa Clara County and from Contra Costa County south through Alameda County to Santa Clara County. These areas also include extensive networks of open space. The counties north of the San Francisco Bay (Marin, Sonoma, and Napa) are more sparsely developed with a combination of suburban development, smaller cities and towns, and agriculture. Other areas of the Bay Area, such as the East Bay (away from the bay margins) and Solano County further to the east, tend to be more suburban in character, with heavy industry related to oil refineries dotting the landscape, as well as large swaths of agriculture. These general characterizations do not capture all the land use types and patterns associated with the nine counties and 101 cities that make up the plan area.

Extent of Urban Development

As discussed in Section 3.3.3, "Regulatory Setting," the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) regularly conducts a statewide land use inventory. Excluding San Francisco, approximately 17% of the region's approximately 4.4 million land acres were considered to be urban built-up land according to the most recent data (2020 and 2022) from the California FMMP (DOC 2020, 2022).[1,2] The remaining undeveloped area includes open space, forestry, and agricultural lands, as well as water bodies (excluding the San Francisco Bay) and parks. In 2018, approximately 32% of the region (1,398,974 acres) is identified as protected areas, which are natural and working lands

[1] The City and County of San Francisco is outside FMMP's survey area.

[2] The most recent FMMP data for Alameda, Napa, and Sonoma counties is from 2022; and for Contra Costa, Marin, San Mateo, Santa Clara, Solano counties is from 2020.

permanently protected by fee title ownership or conservation easement preventing conversion to uses incompatible with biodiversity conservation (Bay Area Open Space Council 2019). According to the FMMP, the amount of urban built-up land in the Bay Area counties, excluding San Francisco, varies from a low of 5% in Napa County to a high of 29% in Contra Costa County (DOC 2020, 2022). The Bay Area includes 101 cities, with San Jose, San Francisco, and Oakland representing the largest urbanized centers. Other major urban centers have formed throughout the region, leading to a pattern of urban land and open space. More information on urban land uses is presented in Section 3.11, "Land Use, Population, and Housing."

AGRICULTURAL LAND

Current and Historical Agricultural Uses

The Bay Area has a substantial amount of land in agricultural uses. Between 2020 and 2022, over half of the region's approximately 4.4 million land acres were zoned for agricultural uses or classified as agricultural land, as defined by the FMMP (DOC 2022). Of these approximately 2.3 million acres of agricultural land, over 70% (about 1.7 million acres) are used for grazing. Products grown in the Bay Area include field crops, fruit and nut crops, seed crops, vegetable crops, and nursery products.

Table 3.3-1 shows the acres of agricultural lands, by farmland type, for each county in the region, excluding San Francisco County. **Figure 3.3-1** shows the location of these agricultural lands within the region. The classification of agricultural lands is based primarily on soils and climate, although Prime Farmland, Farmland of Statewide Importance, and Unique Farmland (collectively referred to as Farmland in accordance with Appendix G of the CEQA Guidelines) must have been used for agricultural production at some time during the previous 4 years. When new data is released, map reviewers, including city and county planning departments, are notified of their availability. Maps prepared under the FMMP are reviewed at the local level for accuracy of land use classification and delineation. For more information about farmland classification, see the discussion in Section 3.3.3, "Regulatory Setting," below.

Table 3.3-1: Bay Area Agricultural Lands

	Alameda	Contra Costa	Marin	Napa	San Mateo	Santa Clara	Solano	Sonoma	Region Total
Prime Farmland	3,200	24,200	1	30,500	1,600	13,900	129,600	30,100	233,100
Farmland of Statewide Importance	1,200	7,300	100	9,500	130	3,300	6,900	17,700	46,100
Unique Farmland	2,000	2,900	260	16,700	2,000	2,200	10,800	33,900	70,800
Farmland of Local Importance	0	61,300	62,500	17,500	740	16,500	0	78,800	237,300
Farmland Subtotal	6,400	95,700	62,900	74,200	4,500	35,900	147,300	160,500	587,300
Grazing Land	240,100	159,300	89,000	177,700	49,300	373,400	205,300	414,900	1,709,000
Regional Total	246,500	255,000	151,900	251,900	53,770	409,300	352,600	575,400	2, 296,000

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding. Prime = farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.

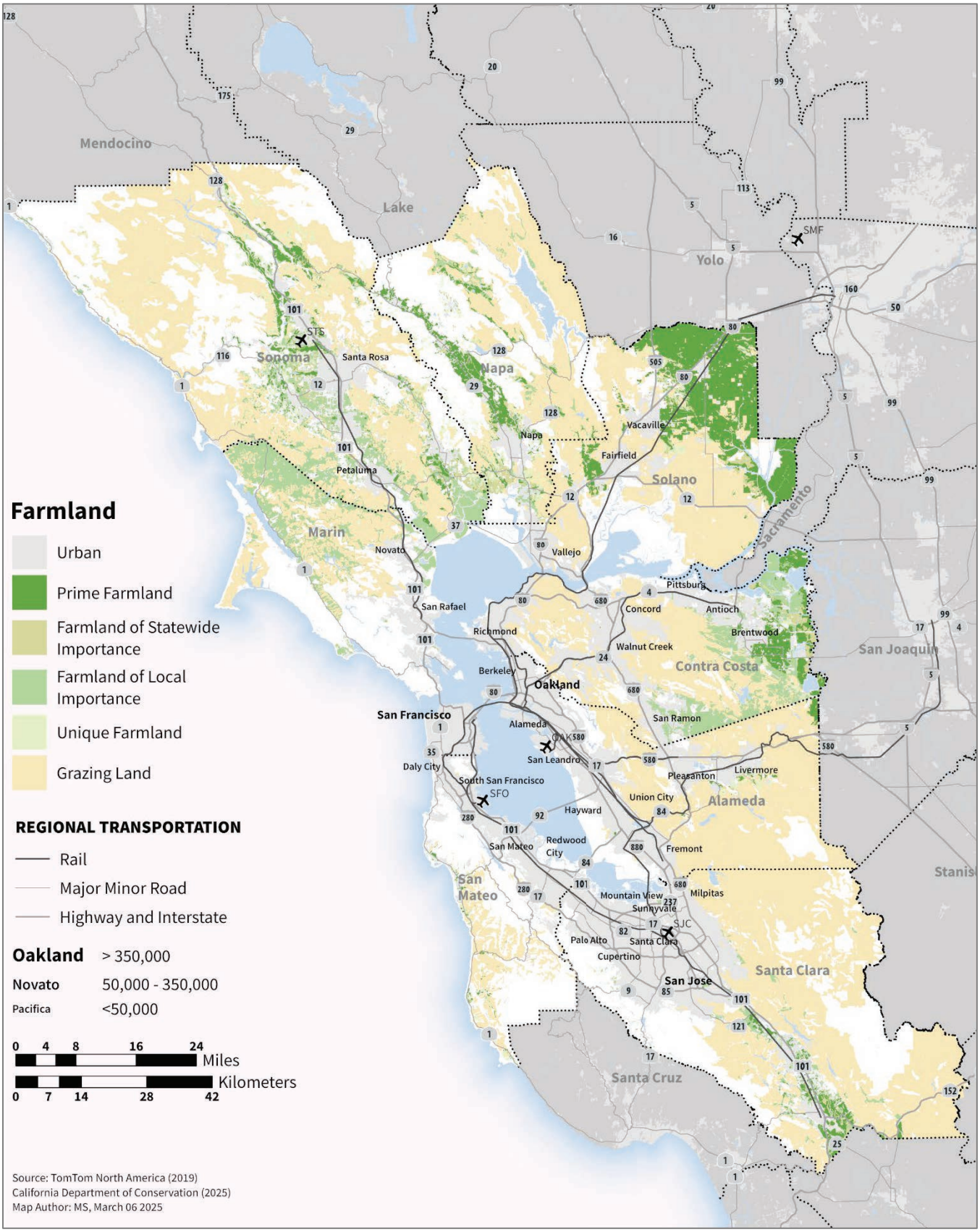
Statewide Importance = similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store moisture.

Unique = farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards.

Local Importance = important to the local agricultural economy as determined by the county's board of supervisors and local advisory committee. Grazing = land on which the existing vegetation is suited to the grazing of livestock.

Sources: DOC 2020, 2022; data compiled by MTC and ABAG in 2025.

Figure 3.3-1: Agricultural Lands



Source: Figure provided by MTC and ABAG, adopted by Ascent in 2025.

Williamson Act Lands

In 1965, the State legislature passed the California Land Conservation Act (better known as the Williamson Act) in response to agricultural property tax burdens resulting from rapid land value appreciation. Rapidly rising property taxes, resulting from nearby urbanization, made agricultural uses increasingly less economically viable. See the discussion in Section 3.3.3, "Regulatory Setting," for a comprehensive description of the Williamson Act.

Agricultural land under Williamson Act contract includes both "prime" and "nonprime" lands. The California Land Conservation Act defines prime agricultural land as (1) US Department of Agriculture (USDA) Class I or II soils; (2) land with a Storie Index soil rating of 80–100; (3) land that has returned a predetermined annual gross value for 3 of the past 5 years; (4) livestock-supporting land with a carrying capacity of at least one animal unit per acre; or (5) land planted with fruit or nut trees, vines, bushes, or crops that have a nonbearing period of less than 5 years and that will normally return a predetermined annual gross value per acre per year during the commercial bearing period (Government Code Sections 51200–51207). Nonprime lands include pasture and grazing lands and other non-irrigated agricultural land with lesser-quality soils. Prime agricultural lands under the Williamson Act are defined differently from Prime Farmland under the FMMP, as outlined above.

Based on data compiled by MTC and AGAG from DOC, approximately 1.15 million acres of land were under Williamson Act contracts in the Bay Area between 2023 and 2024. Of the total acres, approximately 14% were designated as prime farmland, 46% were nonprime, and the remaining 40% included hybrid farmland, open space, and renewal and nonrenewal farmland.[3] **Table 3.3-2** shows the number of acres of land under Williamson Act contracts in the Bay Area between 2023 and 2024, and Williamson Act lands are shown in **Figure 3.3-2**.

Table 3.3-2: Land under Williamson Act Contracts in the Bay Area (2023-2024)

	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano	Sonoma	Regional Total
Williamson Act Contracts Land (acres)	142,200	41,100	81,700	84,400	0	44,100	233,900	261,300	266,500	1,155,000

Note: Figures may not sum because of independent rounding.

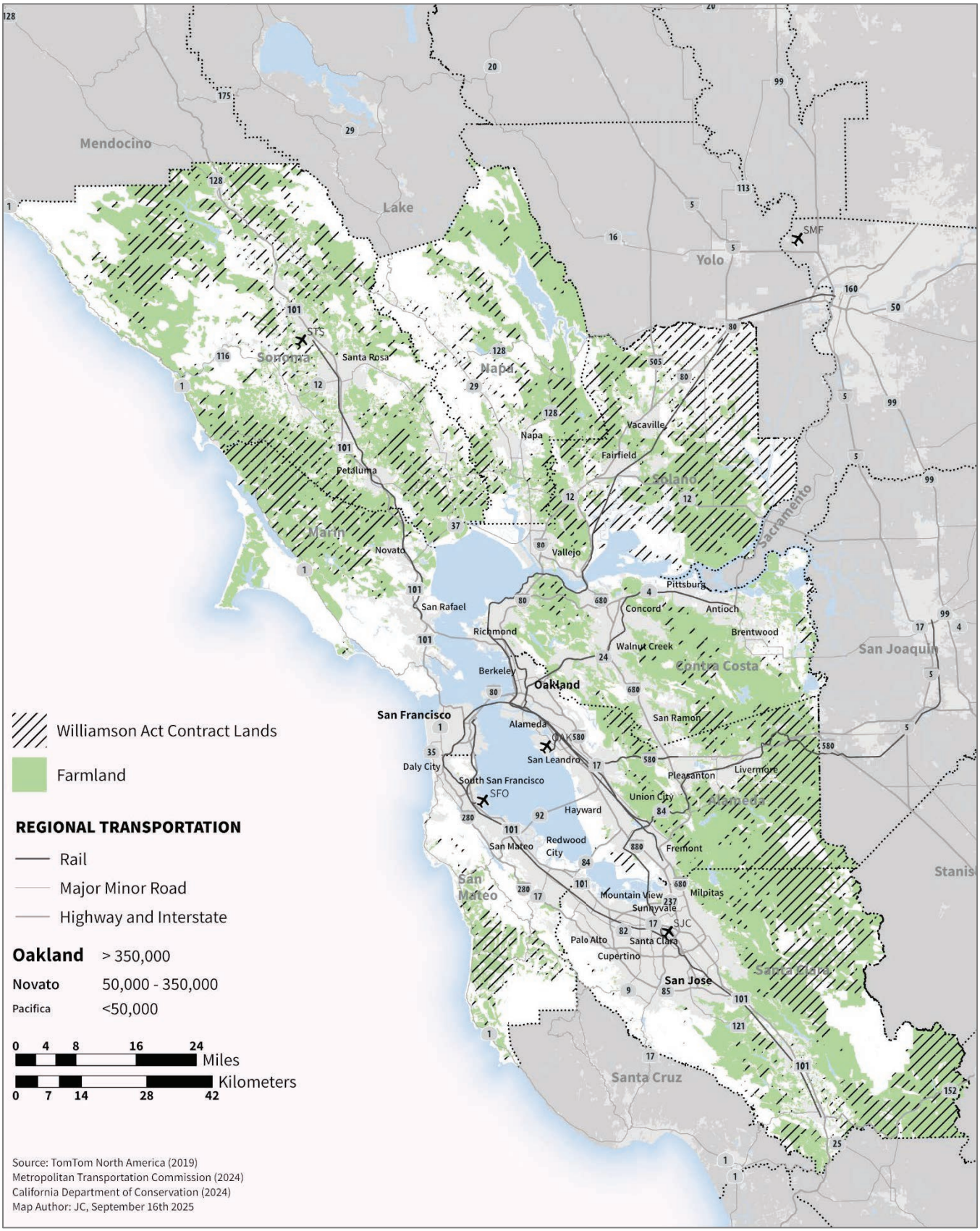
Source: Compiled by MTC and ABAG in 2025.

Forests

The Bay Area includes a variety of forest types spread throughout the nine-county region. Forests are generally located at higher elevations of the Coast Ranges in areas with sufficient moisture. Forestland is a valuable environmental and aesthetic resource and a defining feature in many parts of the landscape in the Bay Area. Forest habitats include a wide range of woodland and forest species. In the Bay Area, forests (including reserved forest and unreserved timberland forests) are found in Alameda (116,100 acres), Contra Costa (52,000 acres), Marin (91,100 acres), Napa (170,500 acres), San Mateo (93,900 acres), Santa Clara (282,200 acres), Solano (19,600 acres), and Sonoma (451,800 acres) counties (USDA 2020). For a comprehensive description of specific forest types and species, please refer to Section 3.5, "Biological Resources."

[3] The initial Williamson Act Contract lasts for a period of ten years. After the first of that ten-year period, one more year is automatically added to the term of the contract so that it is always valid for ten years. The property owner can stop the automatic renewal provision by file a "Notice of Nonrenewal."

Figure 3.3-2: Williamson Act Lands



Source: Figure provided by MTC and ABAG, adopted by Ascent 2025.

Priority Conservation Areas

The proposed plan's core approach is "focused growth" in existing communities along the existing transportation network. This approach helps to achieve key regional economic, environmental, and equity goals: It builds upon existing community characteristics, efficiently leverages existing infrastructure, and mitigates impacts on areas with less development. Priority Conservation Areas (PCAs), which are identified, recommended, and approved by local governments, are key to implementing the "focused growth" approach.

PCAs are open spaces that provide agricultural, natural resource, scenic, recreational, and/or ecological values and ecosystem functions. These areas are identified through consensus by local jurisdictions and park/open space districts as lands in need of protection because of pressure from urban development or other factors. PCAs are categorized into four designations: Natural Landscapes, Agricultural Lands, Urban Greening and Regional Recreation. There are 184 PCAs within the region.

3.3.3 Regulatory Setting

FEDERAL REGULATIONS

Farmland Protection Program

The US Natural Resources Conservation Service (NRCS) maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving, and sustaining the nation's limited soil resources. In addition to many other natural resource conservation programs, NRCS manages the Farmland Protection Program, which provides funds to help purchase development rights to keep productive farmland in agricultural uses. Working through existing programs, USDA joins with State, tribal, or local governments to acquire conservation easements or other interests from landowners.

Agricultural Improvement Act of 2018

The Agricultural Improvement Act of 2018, or 2018 Farm Bill, which was signed on December 20, 2018, builds upon and continues to implement many of the crucial programs that serve agricultural producers. The US Department of Agriculture is charged with implementing the bill, which reauthorized previous programs in the 2014 Farm Bill to serve producers now while they seek public input for future programs. The 2018 Farm Bill continued funding for major programs but did include some changes to Natural Resources Conservation Programs such as expanding support to producers who address significant natural resources concerns through adoption of conservation practices and activities. All major conservation programs are continued, although some have been modified. The timing and consequences of farm bill expiration vary by program across the breadth of the act. The Agriculture Improvement Act of 2018 was originally effective until the end of 2023 and has been extended twice for a one-year period (in 2024 and 2025). The 2025 extension continues to be in effect until the end of the 2025 fiscal year (September 30, 2025) or the end of the 2025 crop year (December 31, 2025) depending on the programs.

Federal Farmland Protection Policy Act

NRCS oversees the Farmland Protection Policy Act (FPPA) (7 US Code [USC] Section 4201 et seq.; see also 7 CFR 658). The FPPA (a subtitle of the 1981 Farm Bill) is national legislation designed to protect farmland. The FPPA states that its purpose is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses." The FPPA applies to projects and programs that are sponsored or financed in whole or in part by the federal government. It does not apply to private construction projects subject to federal permitting and licensing, projects planned and completed without assistance from a federal agency, federal projects related to national defense during a national emergency, or projects proposed on land already committed to urban development. The FPPA spells out requirements to ensure that federal programs are compatible with State, local, and private programs and

policies to protect farmland, to the extent practical, and calls for the use of the Land Evaluation and Site Assessment system to aid in analysis. Because MTC or its project sponsors may ultimately seek some federal funding for transportation projects, the FPPA is applicable to the proposed plan.

Federal Forest Legacy Program

The Federal Forest Legacy Program was a part of the 1990 Farm Bill. Its purpose is to identify and protect environmentally important forestlands that are threatened by present or future conversion to non-forest uses. The program provides conservation easements and gives priority to lands that can be effectively protected and managed, as well as lands that have significant scenic, recreational, timber, riparian, fish and wildlife, threatened and endangered species, and other cultural or environmental values. Properties that are "working forests," whereby the forestland is managed for the production of forest products, are also eligible under this program. Involvement in this program by private landowners is voluntary.

Federal Environmental Quality Incentives Program

The Environmental Quality Incentives Program is a voluntary program that provides financial and technical assistance through contracts up to 10 years in length to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land. These contracts provide financial assistance to help plan and implement conservation practices that address natural resource concerns and for opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. In addition, another purpose of the program is to help producers meet federal, State, tribal and local environmental regulations.

STATE REGULATIONS

The Delta Protection Act of 1992

The Delta Protection Act of 1992 established the Delta Protection Commission, a state entity to plan for and guide the conservation and enhancement of the natural resources of the Sacramento–San Joaquin Delta (Delta) while sustaining agriculture and meeting increased recreational demand. The act defines a Primary Zone, which comprises the principal jurisdiction of the Delta Protection Commission. The Secondary Zone is the area outside the Primary Zone and within the "Legal Delta"; the Secondary Zone is not within the planning area of the Delta Protection Commission. Portions of Alameda, Contra Costa, and Solano Counties overlap with the Primary Zone. The act requires the Delta Protection Commission to prepare and adopt a land use and resource management plan for the Primary Zone of the Delta, which must meet specific goals.

Sacramento-San Joaquin Delta Reform Act of 2009

The Delta Plan, required by the 2009 Sacramento-San Joaquin Delta Reform Act, creates rules and recommendations to further the State's coequal goals for the Delta: improve statewide water supply reliability and protect and restore a vibrant and healthy Delta ecosystem. The plan provides that the goals can be achieved all in a manner that preserves, protects, and enhances the Delta's unique agricultural, cultural, and recreational characteristics. Specific to agricultural land use, one of the five core strategies of the Delta Stewardship Council is to "maintain Delta agriculture as primary land use, food source, a key economic sector, and a way of life." The plan includes specific policies for the protection and promotion of agriculture, such as those that call for wise location of new urban development, promotion of value-added crop processing, agritourism encouragement, wildlife-friendly farming.

California Land Conservation Act

The California Land Conservation Act (Government Code Section 51200 et seq.) of 1965, commonly known as the Williamson Act, provides a tax incentive for the voluntary enrollment of agricultural and open space lands in contracts between local government and landowners. The act allows local governments to assess agricultural land based on the income-producing value of the property rather than the "highest and

best use" value, which had previously been the rule. The contract restricts the land to agricultural and open space uses and compatible uses defined in State law and local ordinances. An agricultural preserve, which is established by local government, defines the boundary of an area within which a city or county will enter into contracts with landowners. Local governments calculate the property tax assessment based on the actual use of the land instead of the potential land value assuming full development.

Terms of Williamson Act contracts are 10 years and longer. The contract is automatically renewed each year, maintaining a constant, 10-year contract, unless the landowner or local government files to initiate nonrenewal. A "notice of nonrenewal" starts the 9-year nonrenewal period. During the nonrenewal process, the annual tax assessment gradually increases. At the end of the 9-year nonrenewal period, the contract is terminated. Only a landowner can petition for a contract cancellation. Tentative contract cancellations can be approved only after a local government makes specific findings and determines that the cancellation fee has been paid by the landowner.

The State of California has the following policies regarding public acquisition of, and locating public improvements on lands in, agricultural preserves and on lands under Williamson Act contracts (Government Code Sections 51290–51295):

- State policy is to avoid locating federal, State, or local public improvements and improvements of public utilities, and the acquisition of land, in agricultural preserves.
- State policy is to locate public improvements that are in agricultural preserves on land other than land under Williamson Act contract.
- State policy is that any agency or entity proposing to locate such an improvement, in considering the relative costs of parcels of land and the development of improvements, give consideration to the value to the public of land, particularly prime agricultural land, in an agricultural preserve.

In 1998, another option in the Williamson Act Program was established with the creation of Farmland Security Zone contracts. A Farmland Security Zone is an area created within an agricultural preserve by a board of supervisors upon the request of a landowner or group of landowners. Farmland Security Zone contracts offer landowners greater property tax reduction and have a minimum initial term of 20 years. Like Williamson Act contracts, Farmland Security Zone contracts renew annually unless a notice of nonrenewal is filed.

State funding was provided in 1971 by the Open Space Subvention Act, which created a formula for allocating annual payments to local governments based on acreage enrolled in the Williamson Act Program. Subvention payments were made through fiscal year 2009 but have been eliminated by the State since that time because of revenue shortfalls. This action affected local support for the Williamson Act because it shifted the burden of the tax revenue reductions to counties. As a result, this tool for farmland conservation, although still used, was significantly weakened.

Assembly Bill 1265 of 2011

AB 1265 (Chapter 90, Statutes of 2011) was approved in summer 2011 and reinstated parts of the Williamson Act, Revenue and Tax Code, and Open Space Subvention Act that allowed eligible counties to recapture 10% of the property tax benefits provided to their owners of Williamson Act lands by decreasing the duration of the Land Conservation Act and Farmland Security Zone contracts by 1 and 2 years, respectively. SB 1353 (Chapter 322, Statutes of 2014), approved by the governor on September 15, 2014, eliminated the January 1, 2016, sunset clause and made the option for participating counties to recapture portions of foregone tax revenue permanent.

California Farmland Conservancy Program

The California Farmland Conservancy Program (PRC Section 10200 et seq.) supports the voluntary granting of agricultural conservation easements from landowners to qualified nonprofit organizations, such as land trusts, as well as local governments. Conservation easements are voluntarily established restrictions that are permanently attached to property deeds, with the general purpose of retaining land in its natural, open space, agricultural, or other condition while preventing uses that are deemed inconsistent with the specific conservation purposes expressed in the easements. Agricultural conservation easements define conservation purposes that are tied to keeping land available for continued use as farmland. Such farmlands remain in private ownership, and the landowners retain all farmland use authority, but farm owners are restricted in their ability to subdivide or use the land for nonagricultural purposes, such as urban uses. Potential impacts on conservation easements would be addressed in subsequent project-level documents.

Farmland Mapping and Monitoring Program

The FMMP is the only statewide land use inventory conducted on a regular basis. The California Department of Conservation administers the FMMP, pursuant to which it maintains an automated map and database system to record changes in the use of agricultural lands. The most recent FMMP data for all Bay Area counties except Alameda, Napa, and Sonoma, is from 2020; date for these counties was updated in 2022. Farmland under the FMMP is listed by category: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. The farmland categories listed under the FMMP are described below. The categories are defined pursuant to USDA land inventory and monitoring criteria, as modified for California.

Prime Farmland

Prime Farmland is land with the best combination of physical and chemical features to sustain long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply necessary to produce sustained high yields. Soil must meet the physical and chemical criteria determined by NRCS. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years before the mapping date by the FMMP.

Farmland of Statewide Importance

Farmland of Statewide Importance is similar to Prime Farmland but with minor differences, such as greater slopes or a lesser ability of the soil to store moisture. Farmland of Statewide Importance must have been used for production of irrigated crops at some time during the 4 years before the mapping date.

Unique Farmland

Unique Farmland has lesser-quality soils than Prime Farmland or Farmland of Statewide Importance. Unique Farmland is used for the production of the State's leading agricultural crops. These lands are usually irrigated but may include non-irrigated orchards or vineyards found in some climatic zones in California. Unique Farmland must have been used for crops at some time during the 4 years before the mapping date.

Farmland of Local Importance

Farmland of Local Importance is farmland that is important to the local agricultural community as determined by each county's board of supervisors and local advisory committees.

Grazing Land

Grazing land is land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.

Right to Farm Act 1981

The Right to Farm Act (Civil Code Section 3482.5) is designed to protect commercial agricultural operations from nuisance complaints that may arise when an agricultural operation is conducting business in a "manner consistent with proper and accepted customs." The code specifies that established operations that have been in business for 3 or more years that were not nuisances at the time they began shall not be considered a nuisance as a result of new land use.

Sustainable Agricultural Lands Conservation Program

The Sustainable Agricultural Lands Conservation Program is a component of the Affordable Housing and Sustainable Communities Program, developed and implemented under the Greenhouse Gas Reduction Fund within the California Budget Act of 2014. The goal of the Affordable Housing and Sustainable Communities Program is to reduce GHG emissions through projects that implement land use, housing, transportation, and agricultural land preservation practices to support infill and compact development.

California Forest Legacy Program Act of 2007

The California Forest Legacy Program Act, similar to the Federal Forest Legacy Program, is a program of the California Department of Forestry and Fire Protection (CAL FIRE). The program provides conservation easements to environmentally sensitive forest areas that have environmental, aesthetic, or commodity value. Money from the program is obtained by gifts, donations, federal grants and loans, and other appropriate funding sources and from the sale of bonds pursuant to the Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act of 2000. Participation in this program by landowners is entirely voluntary. This act defines "forest land" as "land that can support 10% native tree cover of any species, including hardwoods, under natural conditions and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits."

Z'berg-Nejedly Forest Practice Act of 1973

The Z'berg-Nejedly Forest Practice Act of 1973 (FPA) (PRC Sections 4511–4630.2) established the California Board of Forestry and Fire Protection, whose mandate is to protect and enhance the State's unique forest and wildland resources. This mandate is carried out through enforcement of the California Forest Practice Rules (CCR Title 14, Chapters 4, 4.5, and 10). CAL FIRE enforces the laws that regulate logging on nonfederal lands in California. Additional rules enacted by the California Board of Forestry and Fire Protection are also enforced to protect forest and wildland resources. The FPA is intended to achieve "maximum sustained production of high-quality timber products…while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment and aesthetic enjoyment" (PRC Section 4513[b]). The regulations created by the FPA define factors such as the size and location of harvest areas, include measures to prevent unreasonable damage to residual trees, and they address the protection of riparian areas, water courses and lakes, wildlife, and habitat areas.

Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976

Pursuant to the Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976, counties were required to provide for the zoning of land used for growing and harvesting timber as Timberland Production Zones (TPZs) (see California Government Code Section 51110[b]). Designation of land as a TPZ places a 10-year restriction on use of the land. This process replaced the previous process of designating agricultural preserves (through Williamson Act contracts) in timberland. Land use under a TPZ is restricted to growing and harvesting timber and to compatible uses approved by the county. In return, taxation of timberland under a TPZ is based only on such restrictions in use.

California Timberland Productivity Act of 1982

The California Timberland Productivity Act of 1982 (California Government Code Sections 51100–51155) identifies the benefits of the State's timberlands and acknowledges the threat of timberland loss via land use conversions. The law identifies policies intended to preserve timberland, including maintaining an optimum amount of timberland, discouraging premature conversion, discouraging expansion of urban land uses into timberlands, and encouraging investments in timberland. The law establishes TPZs on all qualifying timberland that is devoted to and used for growing and harvesting timber or for growing and harvesting timber and compatible uses. The law also provides that timber operations conducted in a manner consistent with forest practice rules under the FPA shall not be or become restricted or prohibited because of any land use in or around the locality of those operations.

California Air Resources Board Compliance Offset Protocol for US Forest Projects

The Forest Protocol provides requirements and methods for quantifying the net climate benefits of activities that sequester carbon on forestland. The protocol provides offset project eligibility rules; methods to calculate an offset project's net effects on GHG emissions and removal of carbon dioxide from the atmosphere; procedures for assessing the risk that carbon sequestered by a project may be reversed (i.e., released back to the atmosphere); and approaches for long-term project monitoring and reporting. The protocol is designed to ensure that the net GHG emissions reductions and GHG removal enhancements caused by an offset project are accounted for in a complete, consistent, transparent, accurate, and conservative manner and may therefore be reported as the basis for issuing CARB or registry offset credits. The protocol provides eligibility rules, methods to quantify GHG reductions, project-monitoring instructions, and procedures for reporting Offset Project Data Reports. Additionally, all offset projects must submit to independent verification by CARB-accredited verification bodies.

California Department of Forestry and Fire Protection

CAL FIRE enforces the laws that regulate logging on nonfederal lands in California. It also provides periodic assessments of forest resources within California as part of the Fire and Resource Assessment Program. *California's Forests and Rangelands: 2017 Assessment* presents an assessment of the trends, conditions, and degree to which forest and rangeland conversion has occurred. CAL FIRE also maintains the Forest Legacy Program, which is intended to identify and protect environmentally important forestlands that are threatened by conversion of land to non-forest uses either by purchase or through deed restrictions, such as conservation easements. On October 30, 2015, Governor Brown issued an emergency proclamation and established the California Tree Mortality Task Force (now a working group under the Forest Management Task Force). On September 1, 2017, Governor Brown issued Executive Order B-42-17 to bolster the State's response to unprecedented tree die-off. One goal of the task force was to identify and map areas of tree mortality that pose the greatest potential for harm to people and property. These areas, known as High Hazard Zones, are the areas prioritized for tree removal. Goals of the task force include increasing the rate of forest treatments and expanding State wood product markets through innovation, assistance, and investment. Advancing forest health project capacity, readiness, and completion statewide aligns with the California Forest Carbon Plan, the goal of which is to establish healthy and resilient forests that can withstand and adapt to wildfire, drought, and a changing climate.

REGIONAL AND LOCAL REGULATIONS

In accordance with Government Code Section 65584(a), ABAG, has been designated by the State and federal governments as the official comprehensive planning agency for the Bay Area. ABAG reviews projects of regional significance for consistency with regional plans. Plan Bay Area 2050+ would provide a policy guide for planning the region's housing, economic development, environmental quality, transportation, recreation, and health and safety.

One Bay Area Grant Program

MTC's One Bay Area Grant program (OBAG) is a funding approach that aligns MTC's investments with support for focused growth. Established in 2012, OBAG taps federal funds to maintain MTC's commitments to regional transportation priorities while also advancing the Bay Area's land use and housing goals. OBAG includes both a regional program and a county program that:

- targets project investments in Priority Development Areas and
- rewards cities and counties that approve new housing construction and accept allocations through the RHNA process.

Cities and counties can use these OBAG funds to invest in:

- local street and road maintenance,
- streetscape enhancements,
- bicycle and pedestrian improvements,
- transportation planning,
- Safe Routes to School projects, and
- PCAs.

MTC, in late 2015, adopted a funding and policy framework for the second round of OBAG grants. Known as OBAG 2, the second round of OBAG funding totaled about $800 million for projects from 2017/2018 through 2021/2022. The third round of OBAG funding (OBAG 3) was adopted by MTC in January 2022 and includes more than $750 million in federal funding for projects implemented from 2023 to 2026.

California Government Code, Section 56000

Each county in California has a local agency formation commission (LAFCO), which is the agency that has the responsibility to create orderly local government boundaries, with the goals of encouraging the orderly formation of local governmental agencies and the preservation of open space lands and discouraging urban sprawl. LAFCOs are governed by Section 56000 of the California Government Code. This legislation sets the commission's powers and duties, procedures for establishing and changing governmental boundaries, and other statewide policies that LAFCOs must consider while making their determinations. While LAFCOs have no direct land use power, their actions determine which local government will be responsible for planning new areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influences for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolutions of cities.

City and County General Plans

The most comprehensive land use planning for the Bay Area region is provided by city and county general plans, which local governments are required by State law (California Government Code Section 65300 et seq.) to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by State law or that the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, and/or growth management. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas). Issues pertaining to land use are described in the land use element, issues pertaining to agricultural and forest resources are described in the conservation element, and issues pertaining to open space are described in the open space element of general plans.

City and County Zoning

The city or county zoning code or ordinance is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code establishes separate districts or zones (e.g., residential, commercial, industrial, public, open space), presents standards for development in different districts, and identifies which uses are allowed in the various zoning districts to ensure neighboring land uses are compatible with one another. State law requires the city or county zoning code to be consistent with the jurisdiction's general plan. The zoning code usually establishes specific districts for agriculture and/or forestry resources to protect farmland and farming activities from incompatible nonfarm uses and vice versa. Agricultural zoning can specify many factors, such as the farm uses allowed, minimum farm size, the number of nonfarm dwellings allowed, or the size of a buffer separating farm and nonfarm properties.

Growth Control Measures

Local growth control endeavors to manage community growth by various methods, including tying development to infrastructure capacity or traffic level of service standards, limiting the number of new housing units, setting limits on the increase of commercial square footage, linking development to a jobs-to-housing balance, and adopting urban growth boundaries. These goals and others can be achieved through the adoption of a countywide growth management program. Growth management programs, such as adopting urban growth boundaries, have been implemented by county government and/or cities in all of the nine Bay Area counties. Section 3.11, "Land Use, Population, and Housing," lists cities and counties with urban growth boundaries.

Public Ownership, Purchase of Development Rights, and Open Space Acquisition

Local governments and special districts, either on their own or working with land trusts and conservancies, can acquire fee title to agricultural and open space lands or purchase development rights to preserve rural and agricultural areas, watersheds, or critical habitat or to create public parks and recreational areas. Such actions have been undertaken in all Bay Area counties and have had significant effects on the shape of cities and urban form in the region.

3.3.4 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use, or conflict with existing zoning for agricultural use, or a Williamson Act contract (Criterion AGF-1);
- conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]) (Criterion AGF-2); or
- involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use (Criterion AGF-3).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on agriculture and forestry resources based on the location of the proposed plan footprint associated with the forecasted development pattern (i.e., land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of agriculture and forestry resources throughout the Bay Area.

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county).

For this impact assessment, a geographic information system was used to digitally overlay the proposed plan's footprints associated with the forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects onto FMMP designations from the California Department of Conservation, Williamson Act lands, and forest resources from USDA.

The baseline for the following analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025.

This evaluation of agriculture and forestry resource impacts assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. For additional information on analysis methodology, refer to Section 3.1, "Approach to the Analysis."

IMPACTS AND MITIGATION MEASURES

Impact AGF-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use, or conflict with existing zoning for agricultural use, or a Williamson Act contract (PS)

Conversion of Farmland and conflict with existing zoning for agricultural use or a Williamson Act contract related to implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would occur during build out of the plan. Inherently, there are no direct operational impacts following conversion of Farmland. Therefore, construction and operation impacts are not addressed separately. Indirect impacts associated with the conversion of Farmland are addressed in Impact AGF-3.

Land Use Impacts

Land converted from Farmland to other uses can have direct effects when productive land no longer produces crops. Indirect effects would occur if the conversion of Farmland results in fragmentation of agricultural land and adjacent use conflicts, hinders existing transportation access to agricultural lands, or restricts infrastructure options that are necessary to the function of the agricultural property (see Impact AGF-3 for a discussion of indirect impacts resulting from Farmland conversion).

The land use growth footprint is developed through land use modeling that begins with existing zoning and other land use policies, with modifications applied within designated Growth Geographies that may include changes to zoning or land use policy. Outside of the Growth Geographies, zoning remains consistent with existing conditions, although development may still occur where current policies allow residential or nonresidential uses.

The proposed plan's land use strategies could affect land use patterns through increases to residential density and nonresidential intensity within the plan area. The proposed plan's land use growth footprint is concentrated in designated Growth Geographies, which are primarily located in urbanized areas, supporting infill development, including locally nominated Priority Development Areas (PDAs), Priority Production Areas (PPAs), High Resource Areas (HRAs), and Transit Rich Areas (TRAs). Approximately 73% of growth in the proposed plan would occur within these Growth Geographies, which would reduce the effects of the plan on Farmland because the land use growth footprint would generally occur on already developed land. Approximately 826 acres of the proposed plan's land use growth footprint would overlap with Farmland (645 acres of Prime Farmland, 121 acres of Farmland of Statewide Importance, and 60 acres of Unique Farmland). In addition, approximately 2,230 acres and 3,170 acres of the land use growth footprint would overlap with Farmland of Local Importance and Grazing Land, respectively. The majority of potentially affected agricultural lands are Farmland of Local Importance and Grazing Land located in Contra Costa and Solano Counties (**Table 3.3-3**).

Table 3.3-3: Acreage of Land Use Growth Footprint within Agricultural Land by County

County	Prime Farmland (acres)	Farmland of Statewide Importance (acres)	Unique Farmland (acres)	Farmland of Local Importance (acres)	Grazing Land (acres)
Alameda	2	0	<1	0	400
Contra Costa	320	120	10	1,400	1,500
Marin	0	0	0	30	10
Napa	3	< 1	< 1	340	10
San Francisco	0	0	0	0	0
San Mateo	0	0	< 1	0	< 1
Santa Clara	20	0	50	290	20
Solano	280	0	< 1	0	1,100
Sonoma	20	1	< 1	170	130
Regional Total	645	121	60	2,230	3,170

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: DOC 2020, 2022; data compiled by MTC and ABAG in 2025.

Approximately 6 acres of the potentially affected agricultural lands the within the land use growth footprint overlap with land under Williamson Act contract (**Table 3.3-4**). Therefore, the forecasted development pattern could have the potential to result in conflict with land managed pursuant to Williamson Act contracts. Additionally, the parcels under Williamson Act contract are located within lands zoned for agriculture, agricultural preserve, or open space. Therefore, a conflict with agricultural use under a Williamson Act contract could also potentially result in conflict with existing zoning for agricultural use.

Table 3.3-4: Acreage of Land Use Growth Footprint Under Williamson Act Contracts by County

County	Williamson Act Contract (acres)[1]
Alameda	< 1
Contra Costa	< 1
Marin	0
Napa	< 1
San Francisco	0
San Mateo	0
Santa Clara	0

County	Williamson Act Contract (acres)[1]
Solano	< 1
Sonoma	6
Regional Total	6

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number). Figures may not sum because of independent rounding.

[1] Lands under Williamson Act Contracts include prime and nonprime agricultural lands.

Source: Data compiled by MTC and ABAG in 2025.

The proposed plan includes strategies to help protect natural lands and farmlands and reduce overall land consumption. Strategy EN4, Maintain Urban Growth Boundaries, would confine new development within areas of existing development or areas otherwise suitable for growth, as established by local jurisdictions. Strategy EN5, Protect and Manage High-Value Conservation Lands, would provide strategic matching funds to help conserve and maintain high-priority natural and agricultural lands, including but not limited to PCAs and wildland-urban interface lands. Other strategies, in combination with the Growth Geographies, would promote a more compact development pattern, which would help to preserve agricultural lands. Except for San Francisco, all counties in the Bay Area protect open space and agricultural lands by countywide land use measures, such as urban growth boundaries, urban service areas, environmental corridors, slope/density restrictions, stream conservation areas, or riparian buffers.

Counties and cities with urban growth boundaries are summarized in **Table 3.11-3** in Section 3.11, "Land Use, Population, and Housing." Generally, this means that if a project falls outside an urban growth boundary, there are regulatory measures in place to aid local jurisdictions in the protection of natural lands and farmlands, including Farmland. However, there are many cities without urban growth boundaries, and other general growth measures that are in place vary in effectiveness and enforcement.

The proposed plan's forecasted development pattern could have the potential to convert Farmland and conflict with land managed pursuant to Williamson Act contracts or exiting zoning for agriculture. The proposed plan could affect land use patterns through increases to residential density and nonresidential intensity within the plan area. The plan encourages future growth within the designated land use growth footprint (i.e., Growth Geographies) by modifying existing land use policies to support higher residential and nonresidential development. The proposed plan's strategies would not alter land use policies, including zoning, outside of Growth Geographies, where existing conditions would remain unchanged. Although the land use growth footprint is generally located in urbanized settings, some Growth Geographies may include or may be adjacent to lands zoned for agriculture uses. As a result, the policy changes within Growth Geographies could contribute to the conversion of Farmland and conflict with existing zoning for agricultural use or Williamson Act contracts. The potential conversion of Farmland and conflict with lands zoned for agricultural use or lands under Williamson Act contracts would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

As discussed in Chapter 2, "Project Description," the plan's sea level rise adaptation projects could include elevating roadways and rail infrastructure, constructing levees, and implementing seawalls to protect existing urban infrastructure and shoreline communities from erosion and flooding caused by sea level rise. These projects could occur in Farmland along the shoreline of the San Francisco Bay, which would convert Farmland to non-agricultural use. Based on spatial analysis using known or approximate site plans for and the preliminary design information for individual projects, approximately 932 acres of the proposed plan's sea level rise adaptation projects footprint would overlap with Farmland (530 acres of Prime Farmland, 42 acres of Farmland of Statewide Importance, and 360 acres of Unique Farmland). In addition, 21,100 acres and 2,250 acres of the sea level rise adaptation projects footprint would overlap with Farmland of Local Importance and Grazing Land, respectively, resulting the potential for conversion of Farmland to non-agricultural use. The majority of potentially affected agricultural lands are Farmland of Local Importance and Grazing Land located in Marin, Napa, and Sonoma Counties (**Table 3.3-5**).

Table 3.3-5: Acreage of Sea Level Rise Adaptation Projects Footprint within Agricultural Land by County

County	Prime Farmland (acres)	Farmland of Statewide Importance (acres)	Unique Farmland (acres)	Farmland of Local Importance (acres)	Grazing Land (acres)
Alameda	0	0	0	0	40
Contra Costa	20	2	< 1	150	10
Marin	0	0	0	5,000	520
Napa	0	10	30	350	700
San Francisco	0	0	0	0	0
San Mateo	70	20	10	0	560
Santa Clara	0	0	0	0	0
Solano	300	< 1	0	0	90
Sonoma	140	10	320	15,600	330
Regional Total	530	42	360	21,100	2,250

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: DOC 2020, 2022; data compiled by MTC and ABAG in 2025.

Additionally, the proposed plan's sea level rise adaptation projects footprint has the potential to convert approximately 11,400 acres of agricultural lands under Williamson Act contract, as documented in **Table 3.3-6**. Therefore, implementation of the sea level adaptation projects could have the potential to result in conflict with land managed pursuant to Williamson Act contracts. As discussed above under "Land Use Impacts," parcels subject to a Williamson Act contract are often located within lands zoned for agriculture, agricultural preserve, or open space. Therefore, a conflict with agricultural use on land subject to a Williamson Act Contract would also potentially result in a conflict with existing zoning for agricultural use.

Table 3.3-6: Acreage of Sea Level Rise Adaptation Projects Footprint under Williamson Act Contracts by County

County	Williamson Act Contract (acres)[1]
Alameda	50
Contra Costa	15
Marin	780
Napa	0
San Francisco	0
San Mateo	330
Santa Clara	450
Solano	1,100
Sonoma	8,700
Regional Total	11,400

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
[1] Lands under Williamson Act Contracts include prime and nonprime agricultural lands.
Source: Data compiled by MTC and ABAG in 2025.

The extent of Farmland conversion would depend on the final scale and design of proposed adaptation projects. The majority of the Farmland conversion would occur in San Mateo, Solano, and Sonoma Counties. The potential conversion of Farmland and conflict with lands zoned for agriculture or lands

under Williamson Act contract due to implementation of sea level rise adaptation projects under the proposed plan would be potentially significant (PS).

Transportation System Impacts

Approximately 200 acres of the proposed plan's transportation projects footprint would overlap with Farmland (130 acres of Prime Farmland, 40 acres of Farmland of Statewide Importance, and 30 acres of Unique Farmland). Additionally, 220 acres and 590 acres of the transportation projects footprint would overlap with Farmland of Local Importance and Grazing Land, respectively. Of the potentially affected agricultural land, the majority (58%) is Grazing Land, 21% is Farmland of Local Importance, 20% is Farmland (**Table 3.3-7**). Additionally, the proposed plan's transportation projects footprint has the potential to convert approximately 150 acres of agricultural lands under Williamson Act contract, as documented for each county in **Table 3.3-8**. Therefore, implementation of the transportation projects could have the potential to result in conflict with land managed pursuant to Williamson Act contracts. As discussed above under "Land Use Impacts," parcels subject to a Williamson Act contract are often located within lands zoned for agriculture, agricultural preserve, or open space. Therefore, a conflict with agricultural use on land subject to a Williamson Act contract would also potentially result in conflict with existing zoning for agricultural use.

Table 3.3-7: Acreage of Transportation Projects Footprint within Agricultural Land by County

County	Prime Farmland (acres)	Farmland of Statewide Importance (acres)	Unique Farmland (acres)	Farmland of Local Importance (acres)	Grazing Land (acres)
Alameda	3	0	0	0	400
Contra Costa	< 1	7	10	40	40
Marin	0	0	0	60	10
Napa	0	0	0	0	0
San Francisco	0	0	0	0	0
San Mateo	0	0	0	0	0
Santa Clara	3	0	0	10	7
Solano	6	0	0	0	120
Sonoma	120	30	20	100	6
Regional Total	130	40	30	210	580

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Sources: DOC 2020, 2022; data compiled by MTC and ABAG in 2025.

Table 3.3-8: Acreage of Transportation Projects Footprint under Williamson Act Contracts by County

County	Williamson Act Contract (acres)
Alameda	70
Contra Costa	10
Marin	1
Napa	0
San Francisco	0
San Mateo	0
Santa Clara	0
Solano	10
Sonoma	60
Regional Total	150

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Source: Data compiled by MTC and ABAG in 2025.

The likelihood of Farmland conversion increases where transportation projects are located at the edges of existing urban areas, along waterways, or over hills separating urban areas. The extent of this area would depend on the final scale and design of transportation projects. The majority of the potential Farmland conversion would occur in Sonoma County. The potential conversion of Farmland acreage and conflict with lands zoned for agricultural use or lands under Williamson Act contract due to implementation of transportation projects under the proposed plan would be potentially significant (PS).

Conclusion

Together, the proposed plan's land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint have the potential to convert Farmland, lands zoned for agriculture or lands under Williamson Act contract to urban uses. The overall amount of these conversions relative to the resources would be small, as described above. However, because any conversion could be considered substantial at a county or local municipality level, the conversion of Farmland and conflict with lands zoned for agricultural use or lands under Williamson Act contracts as a result of land use, sea level rise adaptation projects, or transportation projects would be **potentially significant (PS)**. Mitigation Measure AGF-1 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AGF-1 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Require project relocation or corridor realignment, where feasible, to avoid agricultural land, especially Prime Farmland, Farmland of Statewide Significance, Unique Farmland, and land under a Williamson Act contract.
- Provide buffers, berms, setbacks, fencing, or other project design measures to protect surrounding agriculture, and to reduce conflict with farming that could result from implementation of transportation projects and/or the projected land use growth footprint included as a part of the RTP/SCS.
- Maintain and expand agricultural land protections such as urban growth boundaries.
- Achieve compensatory mitigation in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by the permitting agencies.
- Require acquisition of conservation easements on land in the same jurisdiction, if feasible, and at least equal in quality and size as mitigation for the loss of agricultural land.
- Institute new protection of farmland in the project area or elsewhere through the use of long-term restrictions on use, such as 20-year Farmland Security Zone contracts (Government Code Section 51296 et seq.) or 10-year Williamson Act contracts (Government Code Section 51200 et seq.).

Significance after Mitigation

Implementation of Mitigation Measure AGF-1 would reduce the potentially significant impact of conversion of Farmland, lands zoned for agriculture or lands under Williamson Act contracts to other uses because it would require avoidance or compensation for converted lands. Projects taking advantage of CEQA Streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measure described above, as applicable, to address site-specific conditions. However, the mitigation would not ensure that the forecasted development pattern, sea level rise adaptation projects, and transportation

projects could feasibly relocate or realign to avoid conversion of Farmland and conflict with lands zoned for agricultural use or lands under Williamson Act contract to a less-than-significant level. Accordingly, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact AGF-2: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]) (PS)

Conversion of land related to implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would occur during buildout of the proposed plan. Inherently, there are no direct operational impacts following conversion or rezoning of land. Therefore, construction and operation impacts are not addressed separately. Indirect impacts are addressed in Impact AGF-3.

Land Use Impacts

As discussed in Chapter 2, "Project Description," the proposed plan's core approach is "focused growth" in existing communities along the existing transportation network, as well as communities with well-resourced schools and easy access to jobs, parks, and other amenities. The land use growth footprint is developed through land use modeling that begins with existing zoning and other land use policies, with modifications applied within designated Growth Geographies that may include changes to zoning or land use policies to support higher residential and nonresidential development. The proposed plan's strategies do not alter land use policies, including zoning, outside of the Growth Geographies, where existing conditions would remain unchanged. Although the Growth Geographies are generally located in urbanized settings, some may include or may be adjacent to lands zoned as forest land, timberland, or timberland zoned Timberland Production. As a result, the policy changes within Growth Geographies could conflict with existing zoning for forest land, timberland, or timberland zoned Timberland Production. The impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

The proposed plan anticipates a 4.9-foot inundation along the shoreline communities from sea level rise. Strategy EN1, "Adapt to Sea Level Rise," would protect shoreline communities affected by sea level rise inundation by identifying a series of adaption projects reflected in the Sea Level Rise Resilience Project list. The proposed plan's sea level rise adaptation projects footprint would have the potential to convert forest land or timberland if the projects are located on lands zoned as forest land, timberland, or timberland zoned for Timber Production. Based on spatial analysis, the sea level rise adaption projects footprint would overlay with approximately 800 acres of forest land or timberland (USDA 2023). It is possible that implementation of sea level rise adaptation projects could result in conflicts with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production if the projects are in areas zoned as forest land, timberland, or timberland zoned Timberland Production. The impact would be potentially significant (PS).

Forest land and timberland conversion is anticipated to be approximately 800 acres, though the extent of this area would depend on the final scale and design of sea level rise adaptation projects. The conversion of forest land and timberland from sea level rise adaptation projects would be potentially significant (PS).

Transportation System Impacts

The proposed plan's transportation projects footprint includes capacity increasing projects that would result in construction of new travel lanes on freeways, expressways, or highways or construction of new rail, ferry, or bus rapid transit routes and stations. The locations of transportation projects would mainly be in developed areas and exiting transportation corridors. Therefore, the conversion of forest land and timberland would be limited. Based on spatial analysis, approximately 10 acres of the transportation

projects footprint overlap with forestland and timberland (USDA 2023). Out of the 10 acres, 8 acres are in Sonoma County and 1 acre in Solano County. Forestland impacted in the other counties would be negligible (less than 1 acre). Implementation of transportation projects would potentially result in conflict with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production if the projects are in areas zoned as forest land, timberland, or timberland zoned Timberland Production. The impact would be potentially significant (PS)

Conclusion

The plan encourages future growth within a designated land use growth footprint (i.e., Growth Geographies) by modifying existing land use policies to support higher residential and nonresidential development. Although the land use growth footprint is generally located in urbanized settings, some Growth Geographies may include or may be adjacent to lands zoned as forest land, timberland, or timberland zoned Timberland Production. Therefore, implementation of the land use growth footprint could conflict with existing zoning for forest land, timberland, or timberland zoned Timberland Production. The sea level rise adaptation projects footprint and transportation projects footprint overlap with approximately 800 acres and 10 acres of forest lands and timberlands, respectively. Implementation of sea level rise adaptation projects and transportation projects would potentially result in conflicts with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production if the projects are in areas zoned as forest land, timberland, or timberland zoned Timberland Production. Because the sea level rise adaptation projects and transportation projects would have the potential to result in conflicts with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production. The impact would be **potentially significant (PS)**. Mitigation Measure AGF-2 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AGF-2 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Require project relocation or corridor realignment, where feasible, to avoid land zoned for forest land or timberland.
- Maintain and expand forest land protections such as urban growth boundaries.
- Achieve compensatory mitigation in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by the permitting agencies.
- Require acquisition of conservation easements on land at least equal in quality and size as mitigation for the loss of forest land or timberland.

Significance after Mitigation

Implementation of Mitigation Measure AGF-2 would reduce the potentially significant impact related to conflict with zoning or rezoning of land zoned for forest land or timberland because it would require avoidance or compensation for converted lands. Projects taking advantage of CEQA Streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measure described above, as applicable, to address site-specific conditions. However, because the mitigation would not ensure that the land use growth footprint, sea level rise adaptation projects, or transportation projects could feasibly relocate or realign to avoid lands zoned as forest land or timberland and because compensation may not adequately reduce the impact to a less-than-significant level, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact AGF-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Anticipated growth under the proposed plan would result in conversion of Farmland to non-agricultural use and conversion of forest land to non-forest use. Although the proposed plan would include land use strategies (e.g., Strategy EN4, "Maintain Urban Growth Boundaries," and Strategy EN5, "Protect and Manage High-Value Conservation Lands") and transportation projects that focus new anticipated development in the region's urban built-up areas, some new development from buildout of the plan is anticipated to occur in agricultural areas, on forest land, and/or near the wildland-urban interface. As described under Impact AGF-1, implementation of the proposed plan would result in the conversion of Farmland and conflict with lands zoned for agriculture or under Williamson Act contract. Lands that remain agricultural but located adjacent to urban uses, may feel pressure to develop, as nearby land values increase or as nuisances from urban development spread to agricultural lands. In addition, urban uses, especially newly urbanized areas, can lead to pressure on adjacent farms to change their farming practices (e.g., changing schedules to reduce noise or altering the extent or method of fertilizer and pesticide spraying). Further, expanded transportation infrastructure capacity and the implementation of sea level rise adaptation projects could remove obstacles to growth in existing agricultural areas.

A range of local conservation plans, habitat conservation agencies and State/federal park designated areas provide protection for a substantial amount of forest land and Farmland. The majority of projected development under the proposed plan would occur on existing urban land, thereby minimizing impacts and potential further fragmentation of Farmland, forest land or timberland. As noted above, some Bay Area cities have urban growth boundaries to limit sprawl and protect forest land and agricultural land and timberland. However, a substantial amount of land on the urban and suburban fringe is vulnerable to development, if not within the boundaries of protected lands, and face additional development pressure as adjacent lands are converted from undeveloped to developed uses. Therefore, development projects anticipated to occur under the proposed plan could have the potential to cause other changes in the existing environment that could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. This impact would be potentially significant (PS).

Conclusion

The proposed plan is intended to accommodate future growth within existing municipal boundaries and urbanized areas. However, implementation of the plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in conversion of Farmland or forest land to other uses that would potentially place development pressure onto adjacent undeveloped lands. This impact would be **potentially significant (PS)**. Mitigation Measure AGF-3 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AGF-3 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Implement Mitigation Measures AGF-1 and AGF-2.
- Manage project operations to minimize the introduction of invasive species or weeds that may affect agricultural production on adjacent agricultural land. Where a project has the potential to introduce sensitive species or habitats or have other spill-over effects on nearby agricultural lands, the project proponents shall be responsible for acquiring easements on nearby agricultural land and/or financially compensating for indirect effects on nearby agricultural land. Easements (e.g., flowage

easements) shall be required for temporary or intermittent interruption in farming activities (e.g., because of seasonal flooding or groundwater seepage). Acquisition or compensation would be required for permanent or significant loss of economically viable operations.

- Design project features to minimize fragmenting or isolating agricultural land. Where a project involves acquiring land or easements, ensure that the remaining agricultural land is of a size sufficient to allow economically viable farming operations. The project sponsors shall be responsible for acquiring easements, making lot line adjustments, and merging affected land parcels into units suitable for continued commercial agricultural management.

Significance after Mitigation

Implementation of Mitigation Measure AGF-3 would reduce the potentially significant impact of conversion Farmland or forestland to other uses because it would require avoidance or compensation for converted lands. Projects taking advantage of CEQA Streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, for the reasons described above, the mitigation measures may not be feasible or may not adequately reduce the impact to a less-than-significant level. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

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3.4 AIR QUALITY

This section evaluates the regional air quality impacts of implementing the proposed plan. The analysis focuses on the following criteria pollutants: (1) ground-level ozone precursor emissions, for which the Bay Area is currently designated as a nonattainment area under the national and State standards; (2) respirable particulate matter (PM_{10}), for which the Bay Area is currently designated as nonattainment under the State standard, and (3) fine particulate matter ($PM_{2.5}$) emissions, for which the Bay Area is currently designated as nonattainment under the State standards. It also evaluates criteria pollutants and toxic air contaminants (TACs) from construction activity and local and regional emissions of TACs and $PM_{2.5}$. This EIR examines these pollutants at a regional level. However, for TACs and $PM_{2.5}$, a localized analysis is provided to identify potential public health impacts from locating new sensitive receptors within Transit Priority Areas.

The related issues of greenhouse gas (GHG) emissions and potential climate change effects are addressed separately in Section 3.6, "Climate Change, Greenhouse Gases, and Energy," of this EIR.

A comment was received from the Bay Area Air District (Air District) (formerly the Bay Area Air Quality Management District [BAAQMD]) in response to the Notice of Preparation. The comment letter suggested that road dust should be considered as part of the operational emissions analysis and that use of CARB's upcoming EMFAC2025 emissions model should be used when estimating project emissions. Lastly, Air District comments recommended that the air toxics analysis discuss potential impacts to Overburdened Communities, as defined by the Air District. These issues, including the appropriate model to use for estimating air quality emissions in light of recent federal actions, are addressed in the analysis below.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (State CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor the statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.4.1 Environmental Setting

PHYSICAL SETTING

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, and air temperature, in combination with local surface topography (i.e., geographic features, such as mountains and valleys), determine the effect of air pollutant emissions on local and regional air quality.

Climate, Meteorology, and Topography

The Bay Area region has a Mediterranean climate characterized by wet winters and dry summers. Rainfall totals can vary widely over a short distance, with windward coastal mountain areas receiving over 40 inches of rain, while leeward areas receive about 15 inches. During rainy periods, horizontal and vertical air movement ensures rapid pollutant dispersal. Rain also washes out particulate and other pollutants.

Normally, air temperatures decrease with increasing elevations. Sometimes this normal pattern is inverted, with warmer air aloft and cool air trapped near the earth's surface. This phenomenon occurs in all seasons. In summer, especially when wind speeds are very low, a strong inversion will trap air emissions, and high levels of ozone smog can occur. In winter, a strong inversion can trap emissions of particulate and carbon monoxide near the surface, resulting in unhealthy air quality. Particulate matter (PM) pollution is anticipated to increase because of climate change, which can lead to worsening asthma symptoms, chronic obstructive pulmonary disease, and respiratory infections associated to premature mortality. Increasing temperatures related to climate change are also anticipated to lead to an increase in wildfires across California. Wildfires are a significant source of smoke and PM exposure. PM can also be carried over long distances by wind and then settle on ground or water. Depending on chemical composition, the effects of PM settling may include making lakes and streams acidic, changing the nutrient balance in coastal waters and large river basins, depleting the nutrients in soil, damaging sensitive forests and farm crops, affecting the diversity of ecosystems, and contributing to acid rain effects (EPA 2024).

The Bay Area topography is complex, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Pacific Ocean bounds the area to the west with warmer inland valleys to the south and east. The only major break in California's Coast Ranges occurs at San Francisco Bay. The gap on the western side is called the Golden Gate, and on the eastern side, it is called the Carquinez Strait. These gaps allow air to pass between the Central Valley and the Pacific Ocean. The general region lies in the semipermanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, and offshore winds.

Regional wind patterns vary from season to season. During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, Golden Gate, or the San Bruno Gap. In the winter, the region frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Winter stagnation episodes are characterized by nighttime drainage flows in coastal valleys. Drainage refers to the reversal of the usual daytime air flow patterns; air moves from the Central Valley toward the coast.

Wind tends to move from areas of high pressure to areas of low pressure. In warmer months, this means that air currents move onshore from the Pacific Ocean to inland areas. Pacific Ocean air receives emissions from numerous sources (anthropogenic and biogenic) as it comes onshore and will carry these pollutants to areas many miles away. Mountains and valleys often affect onshore winds. This means that a wind pattern that started as northwesterly will often swing 90 degrees or more when it encounters topographic features.

The climatological pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and a strong inversion produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour, smog potential is greatly reduced. Because of wind patterns and, to a lesser degree, the geographic location of emission sources, high ozone levels usually occur in inland valleys, such as the Livermore area. High PM levels can occur in areas of intense motor vehicle use, such as freeways and ports and in most valley areas where residential wood smoke and other pollutants are trapped by inversions and stagnant air.

Existing Air Quality and Attainment Status Summary

The federal Clean Air Act requires the US Environmental Protection Agency (EPA) to set national ambient air quality standards (NAAQS) (40 CFR Part 50) for six pollutants considered harmful to public health and the environment: ground-level ozone, carbon monoxide, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM, and lead. EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels.

Under amendments to the federal Clean Air Act, EPA has classified air basins, or portions thereof, as either "attainment" or "nonattainment" for each criteria pollutant based on whether the national standards have been achieved. The California Clean Air Act, patterned after the federal Clean Air Act, also designates areas as "attainment" or "nonattainment" for State standards. Thus, California has two sets of attainment-nonattainment designations: one with respect to national standards and one with respect to State standards.

Table 3.4-1 identifies the ambient air quality standards and attainment status for all criteria pollutants. The Bay Area is currently designated as a nonattainment area for State and federal ozone standards, the federal 24-hour $PM_{2.5}$ standard, and State coarse PM (PM_{10}) standards. According to the nonattainment status of these pollutants, this analysis is focused on ground-level ozone precursor emissions and PM emissions.

Table 3.4-2 presents a 10-year Bay Area air quality summary for days over the national and California standards for ozone, carbon monoxide, and PM. Each of these criteria pollutants is discussed in more detail in the following pages. Data shown are the most recent available.

Ozone

Ozone is a reactive pollutant that is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X). ROG and NO_X are known as precursor compounds of ozone. Mobile sources (e.g., motor vehicle exhaust) and area sources (e.g., industrial emissions, gasoline vapors, architectural coatings, various consumer products, and chemical solvents) are some of the main sources of ROG and NO_X that contribute to the formation of ozone. Ozone is a regional air pollutant because it is formed downwind of sources of ROG and NO_X under the influence of wind and sunlight. During summertime (particularly on hot, sunny days with little or no wind), ozone levels are at their highest.

Short-term exposure to elevated concentrations of ozone is linked to health effects such as eye irritation and breathing difficulties. Repeated exposure to ozone can make people more susceptible to respiratory infections and aggravate preexisting respiratory diseases. Long-term exposures to ozone can cause more serious respiratory illnesses. Ozone also damages trees and other natural vegetation; reduces agricultural productivity and causes deterioration of building materials, surface coatings, rubber, plastic products, and textiles.

Tables 3.4-3 and 3.4-4 show exceedances of the State 1-hour ozone standard and national 8-hour ozone standard, respectively. The number of days the region experiences unhealthy ozone levels has fallen overall from 2010 to 2024. This improvement is because of the California Air Resources Board (CARB) regulations affecting motor vehicle emissions and Bay Area Air District regulations to reduce emissions from industrial and commercial sources.

Table 3.4-1: Bay Area Ambient Air Quality Standards and Attainment Status as of 2025

Pollutant	Averaging Time	California Standard[1,3]	Attainment Status for California Standard[1]	Federal Primary Standard[2,3]	Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Nonattainment[4]	0.070 ppm	Nonattainment[5]	Motor vehicles, other mobile sources, combustion, industrial, and commercial processes
	1 hour	0.09 ppm	Nonattainment	—	—[6]	
Carbon monoxide (CO)	8 hour	9.0 ppm	Attainment	9 ppm	Attainment[7]	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm	Attainment	0.100 ppm[8]	—[8]	Emissions from cars, trucks, and buses
	Annual Arithmetic Mean	0.030 ppm	—	0.053 ppm	Attainment	
Sulfur dioxide (SO_2)[12]	24 Hour	0.04 ppm	Attainment	0.14 ppm	—[9]	Fossil fuel combustion at power plants and other industrial facilities, and burning of high sulfur–containing fuels by locomotives, large ships, and nonroad equipment
	1 Hour	0.25 ppm	Attainment	0.075 ppm	—[9]	
	Annual Arithmetic Mean	—	—	0.030 ppm	—[9]	
Particulate matter (PM_{10})	24 Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	Annual Arithmetic Mean	20 µg/m^3	Nonattainment[10]	—	—	
Particulate matter, Fine ($PM_{2.5}$)	24 Hour	—	—	35 µg/m^3[3–11]	Nonattainment	
	Annual Arithmetic Mean	12 µg/m^3	Nonattainment[10, 12]	9 µg/m^3[3–11]	Unclassified/ Attainment	
Lead[13]	30-day Average	1.5 µg/m^3	—	—	Attainment	Fuels in on-road motor vehicles and industrial sources
	Calendar Quarter	—	—	1.5 µg/m^3	Attainment	
	Rolling 3-Month Average[14]	—	—	0.15 µg/m^3	—[14]	

Pollutant	Averaging Time	California Standard[1,3]	Attainment Status for California Standard[1]	Federal Primary Standard[2,3]	Attainment Status for Federal Standard	Major Pollutant Sources
Visibility-reducing particles (VRP)	8 hour (10:00 to 18:00 PST)	—[14]	—	No National Standards		Same as particulate matter sources
Sulfates	24 hour	25 µg/m^3	Attainment			Combustion of petroleum fuels that contain sulfur
Hydrogen sulfide	1 hour	0.03 ppm	Unclassified			Natural gas and anaerobic decomposition (e.g., sewer gas, wastewater treatment plants)
Vinyl chloride[15]	24 hour	0.010 ppm	No information available			Plastics manufacturing, landfills, wastewater treatment plants, and hazardous waste sites

Notes: ppb = parts per billion; ppm = parts per million; µg/m^3 = micrograms per cubic meter; NAAQS = national ambient air quality standards; VRP = visibility-reducing particles.

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility-reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that the California Air Resource Board (CARB) determines would occur less than once per year on the average. The Lake Tahoe carbon monoxide standard is 6.0 ppm, a level one-half the national standard and two-thirds the State standard.

[2] National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone and particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the 3-year average of the fourth-highest daily concentrations is 0.070 ppm (70 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3.
Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially averaged across officially designed clusters of sites falls below the standard.

[3] National air quality standards are set by the US Environmental Protection Agency (EPA) at levels determined to be protective of public health with an adequate margin of safety.

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

[5] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over 3 years, is equal to or less than 0.070 ppm. Nonattainment areas will have until late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.

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

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

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

[9] The current primary standard is set at a level of 75 ppb, as the 99th percentile of daily maximum 1-hour SO_2 concentrations, averaged over 3 years.

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

[11] On February 7, 2024, EPA changed the NAAQS for $PM_{2.5}$ to 9.0 micrograms per cubic meter to provide increased public health protection, consistent with the available health science.

[12] On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This EPA rule suspends key State Implementation Plan requirements as long as monitoring data continue to show that the Bay Area attains the standard. Despite this EPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until such time as the Bay Area Air District submits a "redesignation request" and a "maintenance plan" to EPA, and EPA approves the proposed redesignation.

[13] National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

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

[15] CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined.

Sources: EPA 2025a; CARB 2023a, 2024a.

Table 3.4-2: 10-Year Bay Area Air Quality Summary (2010–2019)

Days Over Standard for Ozone, Carbon Monoxide, Particulate Matter, Nitrogen Dioxide, and Sulfur Dioxide													
Year	Ozone Cal 1-Hr	Ozone Nat[1] 8-Hr	Ozone Cal 8-Hr	CO Nat 1-Hr	CO Cal 8-Hr	CO Nat/Cal 8-Hr	PM_{10} Nat 24-Hr	PM_{10} Cal 24-Hr	$PM_{2.5}$ Nat 24-Hr[2]	$PM_{2.5}$ Nat 1-Hr	NO_2 Nat 1-Hr	NO_2 Cal 1-Hr	SO_2 Nat/Cal 24-Hr
2010	8	11	11	0	0	0	0	2	6	0	0	0	0
2011	5	9	10	0	0	0	0	3	8	0	0	0	0
2012	3	8	8	0	0	0	0	2	3	1	1	0	0
2013	3	3	3	0	0	0	0	6	13	0	0	0	0
2014	3	9	10	0	0	0	0	2	3	0	0	0	0
2015	7	12	12	0	0	0	0	1	9	0	0	0	0
2016	6	15	15	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	6	18	1	1	0	0
2018	2	3	3	0	0	0	1	6	18	0	0	0	0
2019	6	9	9	0	0	0	0	5	1	0	0	0	0

Notes: nat = national; Cal = California; hr = hour; CO = carbon monoxide, PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; SIP = State Implementation Plan; EPA = US Environmental Protection Agency.

[1] In October 2015, the EPA implemented a new 8-hour ozone standard of 70 parts per billion. Exceedances are based on this standard. (Note that national and State numbers can differ because of data-handling conventions.)

[2] EPA tightened the national 24-hour $PM_{2.5}$ standard from 65 to 35 µg/m3 in 2006. On January 9, 2013, EPA issued a final rule to determine that the San Francisco Bay Area region attains the 24-hour $PM_{2.5}$ national standard. This EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Air District attains the standard. Despite this EPA action, the Air District will continue to be designated as non-attainment for the national 24-hour $PM_{2.5}$ standard until the Air District submits a redesignation request and a maintenance plan to EPA, and EPA approves the proposed redesignation.

Source: BAAQMD 2020.

Table 3.4-3: Days Exceeding the California 1-Hour Ozone Standard (2010–2023)

Stations by Sub-Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Northern														
Napa/Napa Valley College	1	0	0	0	0	0	0	1	0	1	0	0	0	0
San Rafael	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Santa Rosa/Sebastopol	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vallejo	0	0	0	0	0	0	1	1	0	0	1	1	0	0
Central														
Hayward	—	0	0	0	1	2	0	2	0	2	3	1	2	0
Oakland	1	0	0	0	0	0	0	2	0	1	0	0	0	0
Oakland-West	—	0	0	0	0	0	0	0	0	1	0	0	0	0
Redwood City	2	0	0	0	0	0	0	2	0	0	1	0	0	0
San Francisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Leandro	—	—	—	—	—	—	—	—	—	—-	—	—	—	—
Richmond/San Pablo	1	0	0	0	0	0	—	3	0	1	0	0	0	0
Eastern														
Bethel Island	3	0	1	0	0	0	0	0	0	0	1	1	0	0
Concord	2	2	0	0	1	0	1	0	0	0	2	1	0	0
Fairfield	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Livermore	3	3	2	3	0	1	2	5	2	4	1	3	2	0
Pittsburg	—	—	—	—	—	—	—	—	—	—-	—	—	—	—
San Ramon	—	—	1	0	0	1	1	0	0	1	0	0	0	0
Southern														
Fremont	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Cupertino	—	0	0	0	—	—	—	—	—	—	—	—	—	—
Los Gatos	2	0	0	0	0	1	0	0	0	0	1	0	0	0
Mountain View/Sunnyvale	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose Central	5	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose East	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose	—	1	1	0	0	0	0	3	0	1	1	3	0	0
Gilroy	0	0	0	0	0	1	0	1	1	0	1	0	0	0
San Martin	2	0	0	0	1	1	1	1	0	0	2	1	1	0

Note: — = no data available.
Source: BAAQMD 2020; CARB 2023b.

Table 3.4-4: Days Exceeding the National 8-Hour Ozone Standard (2010-2023)

Stations by Sub-Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Napa/Napa Valley College	2	0	0	1	0	0	0	2	0	2	1	0	—	—
San Rafael	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Santa Rosa/Sebastopol	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Vallejo	1	0	0	0	0	0	1	2	0	1	1	1	0	0
Hayward	—	0	0	0	0	0	0	3	0	2	4	3	2	0
Oakland	0	0	0	0	0	0	0	2	0	2	0	0	0	0
Oakland-West	—	0	0	0	0	0	0	0	0	1	0	0	0	0
Redwood City	1	0	0	0	0	0	0	2	0	2	1	0	0	0
San Francisco	0	0	0	0	0	0	0	0	0	1	0	0	0	0
San Leandro	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Richmond/San Pablo	1	0	0	0	0	0	0	2	0	2	0	0	0	0
Bethel Island	4	2	2	0	0	2	2	1	1	1	2	4	1	0
Concord	1	2	2	0	2	2	2	0	0	2	3	1	0	0
Fairfield	2	1	1	0	0	1	0	0	0	0	3	2	0	0
Livermore	3	2	3	1	4	2	4	6	3	7	2	9	2	1
Patterson Pass	—	—	—	—	—	—	15	—	—	—	—	—	—	—
Pittsburg	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Ramon	—	—	3	0	3	—	1	2	2	1	3	2	0	0
Fremont	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Cupertino	—	0	0	1	—	—	—	—	—	—	—	—	—	—
Los Gatos	2	0	0	0	1	4	0	3	0	2	3	3	0	0
Mountain View/Sunnyvale	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose Central	3	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose East	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Jose	—	0	0	1	0	2	0	4	0	2	2	4	1	0
Gilroy	5	0	0	0	0	3	0	1	0	0	3	1	1	1
San Martin	5	0	1	1	3	4	1	3	1	2	3	6	2	1

Notes: These values reflect exceedances based on ozone standards at the time.
— = no data available.
Source: BAAQMD 2020; CARB 2023b.

Carbon Monoxide

Carbon monoxide is an odorless and invisible gas. It is a nonreactive pollutant that is a product of incomplete combustion of gasoline in automobile engines. Carbon monoxide is a localized pollutant, and the highest concentrations are found near the source. Ambient carbon monoxide concentrations generally follow the spatial and temporal distributions of vehicular traffic and are influenced by wind speed and atmospheric mixing. Carbon monoxide concentrations are highest in flat areas on still winter nights when temperature inversions trap the carbon monoxide near the ground. When inhaled at high concentrations, carbon monoxide reduces the oxygen-carrying capacity of the blood, which, in turn, results in reduced oxygen reaching parts of the body. Most of the Bay Area's carbon monoxide comes from on-road motor vehicles, although a large amount also comes from burning wood in fireplaces.

The approved maintenance plan for the San Francisco–Oakland–San Jose carbon monoxide nonattainment area did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, transportation conformity requirements for carbon monoxide ceased to apply after June 1, 2018 (i.e., 20 years after the effective date of EPA's approval of the first 10-year maintenance plan and redesignation of the area to attainment for the carbon monoxide NAAQS). As a result, as of June 1, 2018, transportation conformity requirements no longer apply for the carbon monoxide NAAQS in the San Francisco–Oakland–San Jose carbon monoxide nonattainment area for Federal Highway Administration/Federal Transit Association projects as defined in 40 CFR 93.101 (see https://www.govinfo.gov/content/pkg/FR-2005-11-30/pdf/05-23502.pdf).

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major humanmade sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions.

Most of the Bay Area's NO_2 comes from on-road motor vehicles. Since the year 2010, the Bay Area has had 12 exceedances of the national NO_2 standard—one exceedance each in 2012 and 2017, with 9 days above the national standard in 2023.

Sulfur Dioxide

SO_2 is produced by stationary sources, such as coal and oil combustion, steel mills, refineries, and pulp and paper mills, as well as by the combustion of fuel containing sulfur. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 parts per million or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis (EPA 2025b).

Most of the Bay Area's SO_2 comes from petroleum refineries. Bay Area refineries are the largest source of sulfur oxide (SO_X) emissions. Although these major sources are present, the overall concentration of SO_2 in the region is low. No State or federal excesses of sulfur compound emissions have been recorded since 1976 (BAAQMD 2025).

Particulate Matter

PM includes dirt, dust, soot, smoke, and liquid droplets found in the air. Coarse PM, or PM_{10}, refers to particles less than or equal to 10 microns in diameter (about one-seventh the diameter of a human hair). PM_{10} is primarily composed of large particles from sources such as road dust, residential wood burning, construction/demolition activities, and emissions from on- and off-road engines. Some sources of PM, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in diameter, and it contains particles formed in the air from primary gaseous emissions. Examples include sulfates formed from SO_2 emissions from power plants and industrial facilities; nitrates formed from NO_X emissions from power plants, automobiles, and other combustion sources; and carbon formed from organic gas emissions from automobiles and industrial facilities.

The Bay Area experiences its highest PM concentrations in the winter, especially during evening and night hours, because of the cool temperatures, low wind speeds, low inversion layers, and high humidity.

Specifically, $PM_{2.5}$ is viewed as a major component of the region's total PM problem because $PM_{2.5}$ accounts for roughly half of PM_{10} annually. On winter days when the PM standards are exceeded, $PM_{2.5}$ from wood burning at residential land uses are the most likely contributors daily PM emissions (BAAQMD 2012: 89, 135).

Coarse PM and fine PM are small enough to get into the lungs and can cause numerous health problems, including respiratory conditions, such as asthma and bronchitis, and heart and lung disease. People with heart or lung disease, the older people, and children are at highest risk from exposure to PM (EPA 2025c).

Lead

Lead is a metal found naturally in the environment, as well as in manufactured products, and it is a potent neurotoxin that can cause increased chances of cancer and noncancer health effects for adults and children. Lead is known to negatively affect child brain development and function. The major sources of lead emissions have historically been mobile and industrial sources, but it can occur in dust created by demolition or deterioration of lead-based paint. Lead-based paint is present on buildings built before EPA's ban on the use of such paint in 1978. EPA also phased out leaded fuels as of December 1995, resulting in an 89% decline in lead emissions from mobile sources between 1980 and 2010 (EPA 2025d).

In the Bay Area, aircraft exhaust and manufacturing are the major sources of lead emissions (STI 2008). Contact with lead-based paint in older communities and demolition activities are also active health concerns in region (EPA 2025d). CARB established risk management guidelines in 2001 to identify new, modified, and existing sources of lead in the State to better understand the health risks, control emissions, and reduce exposure to lead (CARB 2001).

Toxic Air Contaminants

The California Health and Safety Code defines TACs as air pollutants that may cause or contribute to an increase in mortality or in serious illness or that may pose a present or potential hazard to human health. TACs are less pervasive in the urban atmosphere than criteria air pollutants, but they are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. For evaluation purposes, TACs are separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to TACs. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Cancer risk from carcinogens is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure. Noncarcinogens differ in that there is a safe level at which it is generally assumed that no negative health impacts would occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs with varying degrees of toxicity. TACs may also exist as PM or as vapors or gases. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust—particularly diesel-powered vehicles. Compared to other air toxics that CARB has identified and controlled, diesel particulate matter (diesel PM) emissions are estimated to be responsible for about 70% of the total ambient air toxics risk statewide (CARB n.d.).

The three most potent carcinogens—diesel PM overall, and 1,3-butadiene and benzene as specific components of diesel PM—come primarily from motor vehicles. Cleaner motor vehicles and fuels are reducing the risks from these three priority toxic air pollutants. The remaining toxic air pollutants, such as hexavalent chromium and perchloroethylene, although not appearing to contribute as much to the overall risks, can present high risks to people living close to a source because of the highly localized concentration of TACs. CARB has control measures for motor vehicles, consumer products, and industrial source programs either already in place, in development, or under evaluation for most TACs.

Health risks from diesel PM are highest in areas of concentrated emissions, such as near ports, rail yards, freeways, or warehouse distribution centers. According to CARB, diesel engine emissions are responsible for the majority of California's known cancer risk from outdoor air pollutants. Those most vulnerable are children, whose lungs are still developing, and older people, who may have other serious health problems. According to numerous studies, CARB has also stated that diesel PM is a contributing factor for premature death from heart and lung diseases. In addition, diesel PM reduces visibility and is a strong absorber of solar radiation that contributes to global warming (BAAQMD 2012).

According to CARB, levels of toxic air pollutants have decreased significantly with the adoption of airborne toxic control measures, stringent vehicle standards, requirements for low-emission vehicles, and cleaner fuels. For example, a study published in March 2024 showed that air toxics cancer risks in the greater Los Angeles region, which has some of the worst air quality in the United States, have decreased by more than 80% between 1998 and 2018, including a decrease of about 50% in the period between 2012 to 2018, based on population-weighted model-derived estimates. The study states that these substantial reductions in air toxics levels points to the success of air pollution policies aimed at addressing air toxics emissions (Maestas et al. 2024). Several communities also have established community emission reduction plans that outline actions that stationary facilities and mobile sources can take to further reduce harmful air pollutants (CARB 2024b).

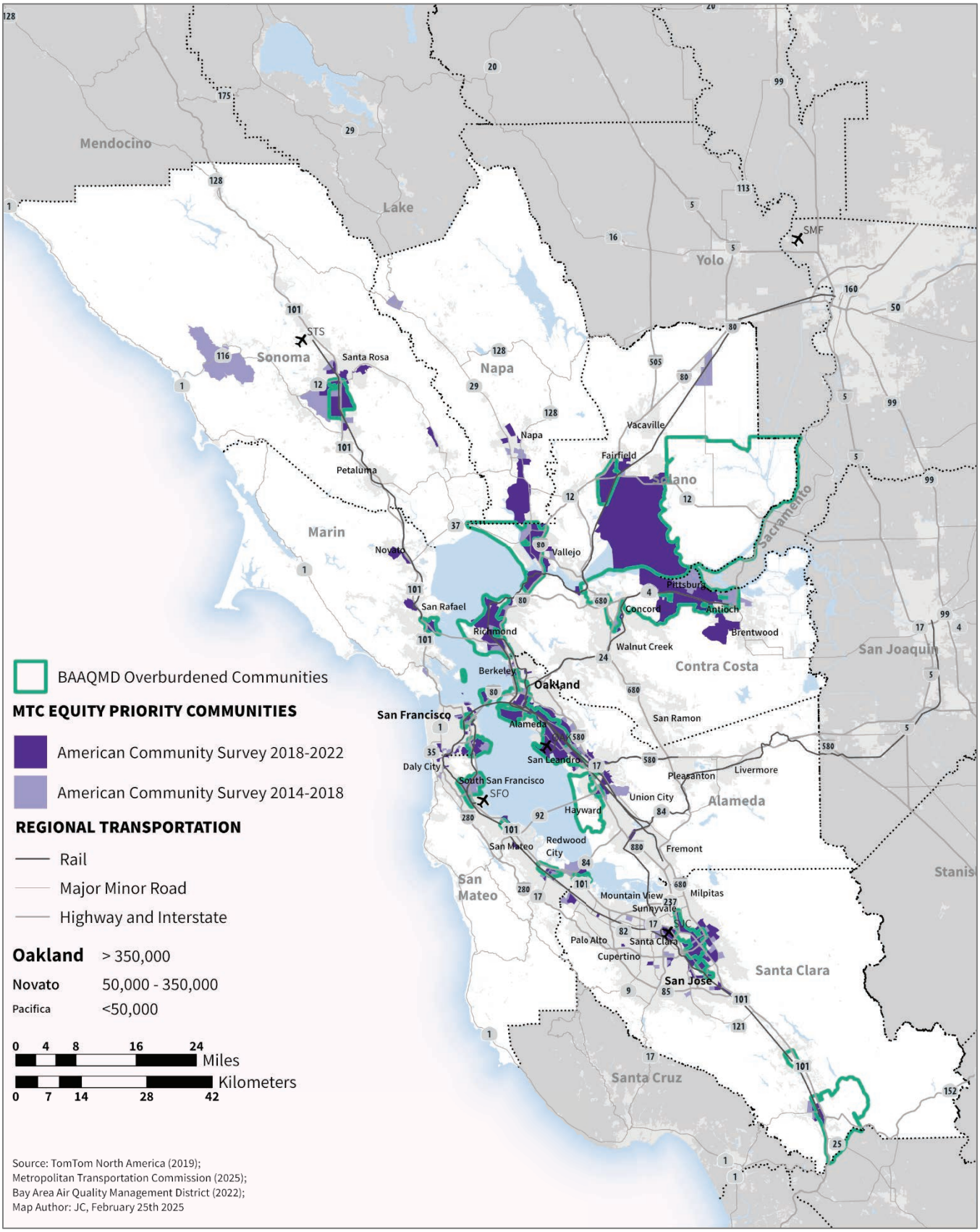
The Bay Area Air District's Community Air Risk Evaluation (CARE) Program, initiated in 2004, works extensively with local governments, communities, and businesses to reduce air pollution and adverse health outcomes in disproportionately affected areas in the Bay Area. Periodically, the CARE Program identifies affected areas by overlaying maps that combine emissions, estimated cancer risks, predicted $PM_{2.5}$ concentrations, and health outcome data.

The CARE program has brought together government, communities, and business in an effort to understand and address localized areas of elevated air pollution and adverse health impacts. Although improvements in air quality continue to occur throughout the Bay Area, levels of air pollution and their impacts vary from location to location. Air pollution levels of many pollutants are highest in proximity to pollution sources—such as near freeways, busy roadways, busy distribution centers, and large industrial sources. Communities where these types of sources are concentrated often have areas within them where air pollution is relatively high and corresponding health impacts are greater (BAAQMD 2014).

Effective July 1, 2022, Bay Area Air District permit regulations set more stringent health risk limits and public noticing requirements for projects located in Overburdened Communities, as defined in Regulation 2-1-243: "Overburdened Communities." See **Figure 3.4-1** for the locations of Overburdened Communities. Additional permit application fees and permit renewal fees may also apply to facilities located in Overburdened Communities. Agencies may use this map to determine whether a project or facility is located in an Overburdened Community and subject to these additional permitting requirements or fees.

In addition to tracking regional criteria pollution levels as measured at central monitoring sites and in addition to tracking TAC pollution levels from individual permitted facilities, the Bay Area Air District tracks the cumulative impacts of exposures to multiple pollutants and multiple sources in the neighborhoods where people live. With the shift toward more consideration of cumulative air pollution exposures, Bay Area Air District staff continues to evaluate the health status of Bay Area residents and how health status affects vulnerability to air pollution. This has been a gradual but important shift. It is a shift that will continue to require closer collaboration between the Bay Area Air District and the region's health departments and health professionals and researchers.

Figure 3.4-1: Designated Overburdened Communities and Equity Priority Communities



Source: Figure provided by MTC and ABAG, adopted by Ascent in 2025.

3.4.2 Regulatory Setting

Air quality is regulated at the federal, State, and regional levels. This section summarizes the applicable air quality regulations and regulatory agencies.

FEDERAL REGULATIONS

Federal Clean Air Act

The federal Clean Air Act (CAA) of 1970, amended in 1977 and 1990 (42 US Code 7506[c]) was enacted for the purposes of protecting and enhancing the nation's air resources to benefit public health. In 1971, the CAA required EPA to set NAAQS to achieve the purposes of Section 109 of the act. The NAAQS require that certain pollutants not exceed specified levels; areas that exceed the standard for specified pollutants are designated as "nonattainment" areas. In promulgating the NAAQs, EPA allowed some states the option to develop stricter State standards. Consistent with this, California adopted its own set of stricter standards under the California Clean Air Act (CCAA) of 1988 (described below under "State Regulations").

The federal CAA requires states to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the CAA. A SIP includes the regulations, programs, and policies that a state will use to clean up polluted areas. States must hold public hearings and provide opportunities for the public and industries to be involved and comment on the development of each state plan.

1990 Amendments to Clean Air Act

The 1990 amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants, which are nationally uniform standards oriented toward controlling particular hazardous air pollutants. Section 112(b) of the CAA identifies 189 "air toxics" (hazardous air pollutants), directs EPA to identify sources of the 189 pollutants, and establishes a 10-year time period for EPA to issue technology-based emissions standards for each source category. Title III of the CAA provides for a second phase under which EPA is to assess residual risk after the implementation of the first phase of standards and impose new standards, when appropriate, to protect public health.

Federal Transportation Conformity Requirements

Transportation conformity is required under the CAA Section 176(c) to ensure that federally supported highway and transportation project activities are consistent with ("conform to") the purpose and requirements of the SIP. Conformity currently applies to areas that are designated nonattainment and those redesignated to attainment after 1990 ("maintenance areas") for the following transportation-related criteria pollutants: ozone, $PM_{2.5}$ and PM_{10}, carbon monoxide, and NO_x. Conformity, for the purpose of the SIP, means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. Conformity is demonstrated by showing that the total air pollutant emissions projected for an RTP/SCS are within the emissions limits ("budgets") established by the SIP.

Conformity requires demonstration that transportation control measures (TCMs) in ozone nonattainment areas are implemented in a timely fashion. TCMs are expected to be given funding priority and to be implemented on schedule, and in the case of any delays, any obstacles to implementation are expected to be or are being overcome. A total of 33 TCMs have been fully implemented since the 1982 Bay Area Air Quality Plan; 12 TCMs were originally listed in the 1982 Bay Area Air Quality Plan, 16 additional TCMs were adopted by MTC in February 1990 in response to a 1990 lawsuit in the federal district court to bring the region back on the "reasonable further progress" track, and five TCMs were adopted as part of the 2001

1-Hour Ozone Attainment Plan. These TCMs include strategies such as improved transit service and transit coordination, ridesharing services and new carpool lanes, signal timing, freeway incident management, and increased gas taxes and bridge tolls to encourage use of alternatives modes.

MTC must make a determination that the proposed plan conforms to the SIP and is consistent with the applicable air quality attainment plans. The transportation conformity analysis and findings prepared by MTC for the proposed plan are addressed in a process separate from the proposed plan environmental review process. Upon completion of the conformity analysis for the proposed plan and associated transportation projects, these materials will be posted for review at https://planbayarea.org/draftplan.

Public Law No. 119-16

On June 12, 2025, Public Law No. 119-16, enacting House Joint Resolution 88, became law. The law relied on the Congressional Review Act to disapprove the EPA's December 2024 waiver under the CAA that allowed California to implement and enforce the Advanced Clean Cars II (ACC II) regulation. ACC II included a zero-emission vehicle (ZEV) mandate with a target of 100% new light-duty ZEV sales by 2035. P.L. No. 119-16 marks the first ever occurrence that waivers under the CAA have been revoked under the Congressional Review Act. The implications of this law on the State's capability to enforce its independent fuel economy standards are uncertain at this time, as the California Attorney General filed a lawsuit challenging P.L. No. 119-16 on June 12, 2025. The case is pending in the trial court. For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis."

Public Law No. 119-17

Public Law 119–17, enacted on June 12, 2025 under the Congressional Review Act, disapproves of the U.S. EPA's rule titled "California State Motor Vehicle and Engine and Nonroad Engine Pollution Control Standards; The 'Omnibus' Low NOX Regulation; Waiver of Preemption; Notice of Decision" (LowNO_x rule). The EPA's LowNO_x rule would have granted California a waiver to enforce stricter emissions standards for both onroad and nonroad heavy-duty engines. Similar to the other Congressional Review Act resolutions listed above targeting emissions waivers, this law prohibits the EPA from reissuing the same or a substantially similar rule without new authorization from Congress. The law effectively blocks California, and any states following its standards, from implementing this omnibus LowNO_X regulatory package. The implications of Public Law 119-7 on the State's ability to enforce its low NO_X rule are uncertain at this time, as the California Attorney General filed a lawsuit challenging P.L. No. 119-17 on June 12, 2025. The case is pending in the trial court. For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis."

Endangerment Finding

On December 7, 2009, the EPA administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. On July 29, 2025, EPA announced a proposal to rescind the Endangerment Finding and repeal all GHG emission standards for light-duty, medium-duty, and heavy-duty vehicles and engines pursuant to CAA section 202(a). The proposed rule would remove GHG-related provisions from 40 CFR part 600 without affecting provisions related to CAFE standards and fuel economy labeling. In general, the proposed rule would remove model years (MY) 2012 and later GHG emission standards for passenger cars and light trucks, and MY 2014 and later GHG emission standards for medium-duty vehicles. For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis."

STATE REGULATIONS

California Clean Air Act

The CCAA of 1988 requires nonattainment areas to achieve and maintain the California ambient air quality standards (CAAQS) by the earliest practicable date and local air districts to develop plans for attaining the State ozone, carbon monoxide, SO_2, and NO_2 standards. CARB sets the CAAQS.

Under the CCAA, areas not in compliance with the standard must prepare plans to reduce ozone. Noncompliance with the State ozone standard does not affect the ability to proceed with any transportation plan, program, or project. The first Bay Area Clean Air Plan was adopted in 1991, and updates to the Clean Air Plan have occurred since then, with the most recent adopted version being the *2017 Clean Air Plan: Spare the Air, Cool the Climate*. The *2017 Clean Air Plan* provides "all feasible measures" to reduce ozone precursors—ROG and NO_x—and reduce transport of ozone and its precursors to neighboring air basins. In addition, the *2017 Clean Air Plan* builds upon and enhances the Bay Area Air District's efforts to reduce emissions of $PM_{2.5}$ and TACs (BAAQMD 2017).

Senate Bill 656 (Chapter 738, Statues of 2003)

In 2003, the California Legislature enacted (Senate Bill) SB 656 (Chapter 738, Statutes of 2003), codified as Health and Safety Code Section 39614, to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 required CARB, in consultation with local air pollution control and air quality management districts (air districts), to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be employed by CARB and the air districts to reduce PM_{10} and $PM_{2.5}$ (collectively referred to as PM). The legislation established a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for $PM_{2.5}$ and provided new direction on PM reductions in those areas not subject to federal requirements for PM. Measures adopted as part of SB 656 complement and support those required for federal $PM_{2.5}$ attainment plans, as well as for State ozone plans. This ensures continuing focus on PM reduction and progress toward attaining California's more health protective standards. This list of air district control measures was adopted by CARB on November 18, 2004.

The Bay Area Air District also complied with this legislation; staff developed a Particulate Matter Implementation Schedule that was adopted by the Bay Area Air District in November 2005, and the Bay Area Air District adopted the measures identified in the implementation schedule (BAAQMD 2012).

Assembly Bill 617 (Chapter 136, Statutes of 2017)

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) is a State-mandated program that uses a community-based approach to reduce local air pollution in disproportionately impacted communities. This program aims to improve community health by reducing exposure to local air pollution sources in the most impacted neighborhoods through the development of Community Emission Reduction Plans (CERP).

Toxic Air Contaminant Identification and Control Act of 1983

The Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner, 1983) created California's program to reduce exposure to air toxics. The program involves a two-step process: risk identification and risk management.

In the risk identification step, and upon CARB's request, the Office of Environmental Health Hazard Assessment evaluates the health effects of substances other than pesticides and their pesticidal uses. Substances with the potential to be emitted or that are currently being emitted into the ambient air may be identified as a TAC.

In the risk management step, once a substance is identified as a TAC, and with the participation of local air districts, industry, and interested public, CARB prepares a report that outlines the need and degree to regulate the TAC through a control measure (California Health and Safety Code Section 39665).

Assembly Bill 2588: Air Toxics "Hot Spots" Information and Assessment Act of 1987

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly, 1987) was enacted in September 1987. Under this act, stationary sources are required to report the types and quantities of certain substances that their facilities routinely release into the air. Emissions of interest are those that result from the routine operation of a facility or that are predictable, consisting of but not limited to continuous and intermittent releases and process upsets or leaks.

The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, and notify nearby residents of significant risks. In September 1992, the "Hot Spots" Act was amended by SB 1731 (Calderon) to address the reduction of significant risks. The bill requires that owners of significant-risk facilities reduce their risks below the level of significance (CARB and CalEPA 1997).

Diesel Risk Reduction Plan

In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as TACs based on data linking diesel PM emissions to increased risks of lung cancer and respiratory disease. Following the identification process, CARB was required to determine whether there was a need for further control, which led to creation of the Diesel Advisory Committee to assist in the development of a risk management guidance document and risk reduction plan. In September 2000, CARB adopted the Diesel Risk Reduction Plan, which recommended control measures to reduce the risks associated with diesel PM and achieve a goal of 75% diesel PM reduction by 2010 and 85% by 2020. It is estimated that by 2035, emissions of diesel PM will be less than half of those in 2010 (CARB 2016).

Specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles are continuing to be evaluated and developed. The goal of these regulations is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

California Health and Safety Code

Under the California Health and Safety Code, Division 26 (Air Resources), CARB is authorized to adopt regulations to protect public health and the environment through the reduction of TACs and other air pollutants with adverse health effects. CARB has promulgated several mobile and stationary source airborne toxic control measures (ATCMs) under to this authority. For instance, effective as of July 2003, CARB approved an ATCM that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns (13 CCR Chapter 10, Section 2480). This ATCM is intended to reduce diesel PM and other TACs and air pollutants from heavy-duty motor vehicle exhaust. It applies to school buses, transit buses, school activity buses, youth buses, general public paratransit vehicles, and other commercial motor vehicles. This ATCM focuses on reducing public exposure to diesel PM and other TACs, particularly for children riding in and playing near school buses and other commercial motor vehicles, who are disproportionately exposed to pollutants from these sources. In addition, effective February 2005, CARB approved an ATCM to limit the idling of diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds, regardless of the state or country in which the vehicle is registered (13 CCR Chapter 10, Section 2485).

Heavy-Duty Vehicle Inspection Program

The Heavy-Duty Vehicle Inspection Program (HDVIP) and the Periodic Smoke Inspection Program (PSIP) are CARB's heavy-duty vehicle inspection programs for in-use trucks and buses. HDVIP requires heavy-duty trucks and buses to be inspected for excessive smoke, tampering, and engine certification label compliance. Any heavy-duty vehicle traveling in California may be inspected, including vehicles registered in other states and foreign countries. CARB inspection teams perform tests at border crossings, California Highway Patrol weigh stations, fleet facilities, and randomly selected roadside locations. Owners of trucks and buses found in violation are subject to minimum penalties starting at $300 per violation. Penalty payment and proof of correction must be supplied to clear violations.

PSIP requires annual opacity self-testing for California fleets with two or more heavy-duty vehicles.

Advanced Clean Cars Program

AB 1493 of 2002 (known as Pavley I, Chapter 200, Statutes of 2002) provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that lowered GHG emissions from new light-duty automobiles to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards referred to as the Advanced Clean Cars (ACC) Program's Low Emission Vehicle (LEV) III Regulation was adopted for vehicle MYs 2017–2025 in 2012 (13 CCR Section 1900 et seq.).

The ACC Program also includes the Zero Emission Vehicle Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of ZEVs, which include battery electric, fuel cell, and plug-in hybrid electric vehicles. The Clean Fuels Outlet regulation is intended to ensure that fuels, such as electricity and hydrogen, are available to meet the fueling needs of new advanced technology vehicles as they come to market. The Advanced Clean Cars II (ACC II) Program was adopted by CARB in August 2022 and provides the regulatory framework for ensuring the sales requirement goal of EO N-79-20 to ultimately reach 100% ZEV sales in the State by 2035. EPA granted CARB its California's CAA waiver request on December 18, 2024. As discussed above (see discussion under Public Law No. 119-6) the December 18, 2024 EPA waiver was voided by Congress in 2025 and signed into law by the president. California is suing the federal government over this action and its fate is currently uncertain.

Advanced Clean Fleets

CARB's 2022 Advanced Clean Fleets regulation was developed to reduce diesel PM through the transition of medium- and heavy-duty trucks to become fully electric by 2045. At the time of the writing of this Draft EIR, California has withdrawn its request for a waiver and authorization for the addition of the Advanced Clean Fleets regulation to its emissions control program (CARB 2025a). CARB is not enforcing the existing portions of the Advanced Clean Fleets regulation that require a federal waiver or authorization, such as the portions of the Advanced Clean Fleet regulation that apply to high-priority and drayage fleets. However, not all elements of the Advanced Clean Fleets regulation require a federal waiver or authorization (CARB 2025a). State and local government fleets will still be required to be fully electric by 2045. Notably, the passing of Public Law No. 119-16, described above, only rescinds the State's ability to enforce the ACC II regulation and does not affect implementation of the Advanced Clean Fleets Regulation.

Advanced Clean Trucks Regulation

CARB adopted the Advanced Clean Trucks (ACT) Regulation in March 2021, with minor amendments in 2024. The regulation aims to accelerate the sales of heavy-duty EVs. The regulation consists of two parts: a manufacturer component and a fleet reporting component. Manufacturers are required to sell an increasing percentage of heavy-duty ZEV between 2024 and 2035. By 2035, 40% of Class 8 truck purchases will be required to be zero emission. Fleets with 50 or more vehicles will be required to report on their fleet's composition and activities in order to help CARB craft new strategies to hasten the

adoption of ZEV (CARB 2025a). EPA granted the waiver request for the ACT regulation on April 6, 2023 (EPA 2023). Notably, the passing of Public Law No. 119-16, described above, only rescinds the State's ability to enforce the ACC II regulation and does not affect implementation of the ACT Regulation.

Transportation Refrigeration Units

CARB's 2022 amendments to the 2004 Transport Refrigeration Unit (TRU) Airborne Toxic Control Measure (2022 TRU Amendments) increases the stringency of TRU $PM_{2.5}$ standards and requires the electrification of diesel-powered TRU trucks by 2029. On January 3, 2025, EPA granted CCAA authorization of elements of its TRU Regulation (90 FR 2000). In its action, EPA did not act on the Regulation's requirements for the turnover of at least 15% of diesel-fueled truck TRU fleet to zero emissions by December 31, 2023 (and each year thereafter), within the 2022 TRU Amendments (EPA 2025b). As of January 2025, CARB has withdrawn its request for the portions of the TRU Regulation on which EPA did not take action in its authorization decision on January 3, 2025 (CARB 2025b).

Senate Bill 1: The Road Repair and Accountability Act of 2017

SB 1 was passed in April 2017 by a two-thirds majority in the California Legislature. As the largest transportation investment in California history, SB 1 is expected to raise $52.4 billion in funding to rebuild neighborhood streets, freeways, and bridges across California. Transportation improvements funded by SB 1 include maintenance of State highways and bridges; repairs to local streets and roads, transit, congested corridors and trade corridors; and bike and pedestrian projects. Funding for SB 1 comes from State gas tax and vehicle fees. It is split evenly between State and local governments for highway and local road repair and maintenance. SB 1 doubles the amount of revenue that cities, such as the City of Oakland, receive from the State for local street maintenance and repair.

Proposition 1B: Goods Movement Emission Reduction Program

The $1 billion Proposition 1B: Goods Movement Emission Reduction Program is a partnership between CARB and local agencies, air districts, and seaports to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. Local agencies apply to CARB for funding. Then those agencies offer financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies. Projects funded under this program must achieve early or extra emission reductions not otherwise required by law or regulation.

California Consumer Products Regulations

The Consumer Products Regulatory Program is an important part of the overall effort to reduce the amount of volatile organic compounds (VOCs) that are emitted from using chemically formulated consumer products, such as hairsprays, deodorants, cleaning products, spray paint, and insecticides. California has adopted the following regulations to regulate VOCs in consumer products:

- **Antiperspirants and Deodorants Regulation**: Sets VOC limits for antiperspirant and deodorant products. This regulation was originally approved by CARB on November 8, 1989, and became legally effective on February 27, 1991. The most recent amendments became legally effective on August 1, 2022.
- **Consumer Products Regulation**: Limits the reactivity of the ingredients used in 39 categories of aerosol coating products. The regulation was originally approved by CARB on March 23, 1995, and became legally effective on January 8, 1996. The most recent amendments became effective August 1, 2022.
- **Alternative Control Plan Regulation**: Provides a voluntary alternative method to comply with the VOC limits in the Consumer Products Regulation by allowing manufacturers to set up alternative control plans to average the VOC emissions of regulated consumer products. The regulation was originally approved by CARB on September 22, 1994, and became legally effective on September 9, 1995. The most recent amendments became effective August 1, 2022.

REGIONAL AND LOCAL REGULATIONS

Regional Air Districts

The nine-county MTC region encompasses three air basins: the San Francisco Bay Area Air Basin in its entirety, portions of the North Coast Air Basin, and portions of the Sacramento Valley Air Basin. Northern Sonoma County is located within the North Coast Air Basin, and eastern Solano County is located within the Sacramento Valley Air Basin. (The remaining areas not located within those air basins are located within the San Francisco Bay Area Air Basin.) The Bay Area Air District governs the San Francisco Bay Area Air Basin, the Northern Sonoma County Air Pollution Control District (NSCAPCD) governs the North Coast Air Basin, and the Yolo-Solano Air Quality Management District (YSAQMD) governs the Sacramento Valley Air Basin. The geographic boundaries of these three air basins and air districts are shown in **Figure 3.4-2**. Each air pollution control district is responsible for attaining and maintaining air quality standards and undertakes a variety of activities, including adopting and enforcing rules and regulations, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution, responding to citizen inquiries and complaints, monitoring ambient air quality and meteorological conditions, administering incentives-based programs to reduce motor vehicle emissions, and conducting public education campaigns. In California, air pollution control districts generally follow county boundaries; in the more urban areas, county agencies were merged by State legislation into unified air quality management districts.

Seaport Air Quality 2020 and Beyond Plan—Port of Oakland

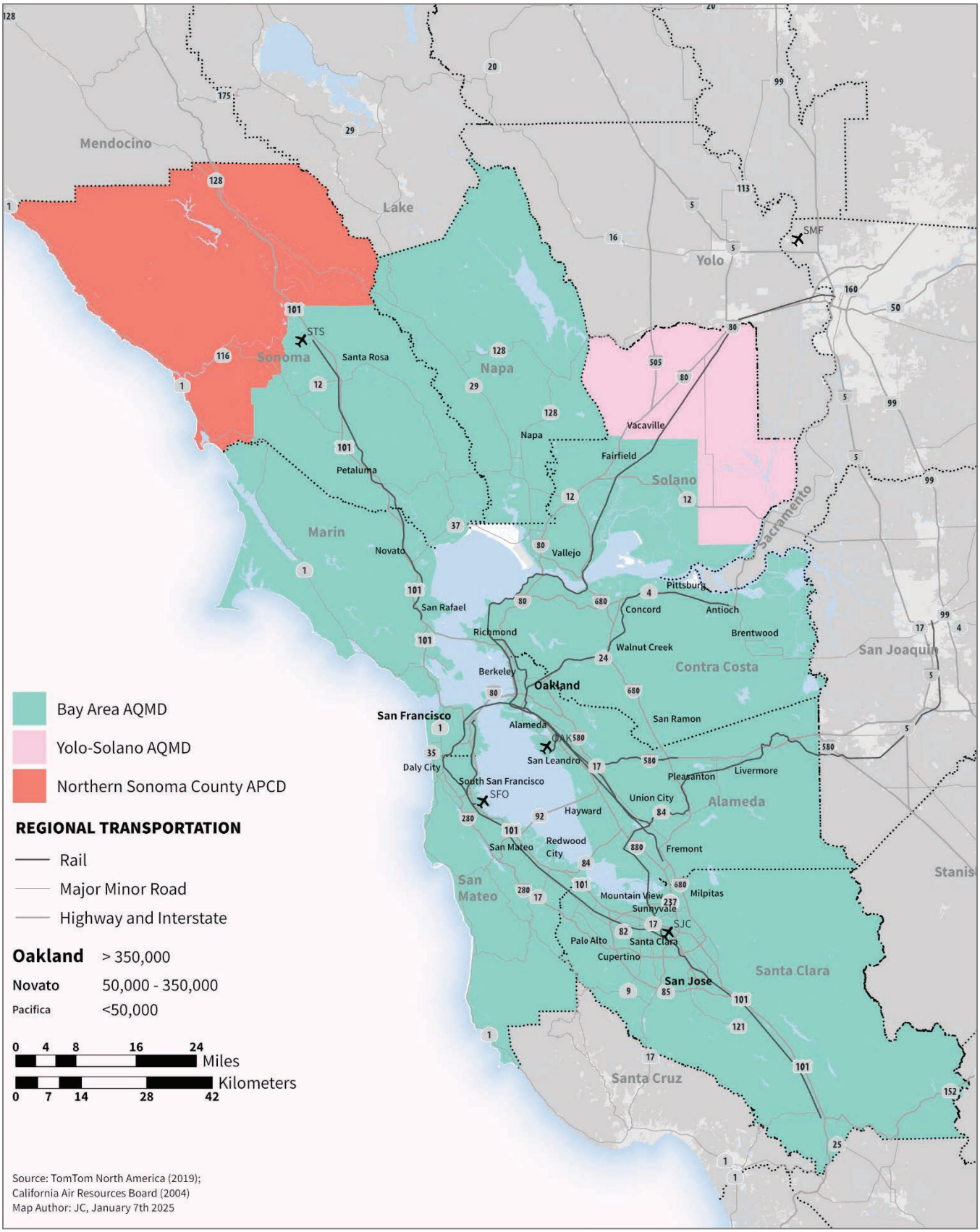
The Port of Oakland (Port) published the *Seaport Air Quality 2020 and Beyond Plan* in 2019 as the Port's master plan toward becoming a zero-emissions seaport. This plan focuses on reducing GHG, criteria air pollutants, and toxic air contaminant emissions, with a focus on reducing diesel PM to improve public health in the surrounding community. The plan evaluates measures to reduce emissions through 2050. Consequently, the *Seaport Air Quality 2020 and Beyond Plan* includes three planning horizons: the Near-Term Phase (2019–2023), the Intermediate-Term Phase (2023–2030), and the Long-Term Phase (2030–2050). Strategies detailed in the plan to reduce port emissions include installing electric infrastructure at container terminals, tracking yard equipment for fuel consumption, operability and performance, and identifying cleaner fuels and alternative, renewable power sources

Owning Our Air: The West Oakland Community Action Plan—West Oakland Environmental Indicators Project and Bay Area Air District

The *Owning Our Air: The West Oakland Community Action Plan* (WOCAP) was developed through a joint effort between the West Oakland Environmental Indicators Project (WOEIP) and the Bay Area Air District. As "co-leads" the Bay Area Air District and WOEIP collaborated with the WOCAP steering committee, a group of residents, researchers, academics, public agencies, nonprofits, and community institutions, to implement WOCAP strategies. The strategies are designed to reduce both air pollution emissions and exposure to air pollution. Reporting on strategy progress is a requirement of the AB 617 program. In 2019, the Bay Area Air District's Board of Directors and CARB adopted the WOCAP.

The *WOCAP Fifth Year Annual Report* was released on October 8, 2024, and details progress toward achieving the plan's emissions targets. Notably, 2024 is the final year of the implementation schedule originally envisioned to meet the plan targets. During implementation of WOCAP, diesel PM emissions from local sources declined by 31%, and the 2025 diesel PM exposure targets were largely achieved for most impact areas. Diesel PM reductions were due to a combination of CARB statewide regulations (e.g., limiting emissions from heavy-duty trucks) and targeted deployment of incentives in West Oakland that resulted in upgrades of older, dirtier tugboats to newer and cleaner models.

Figure 3.4-2: Area Air Basins



Sources: TomTom North America 2019; CARB 2004.

Comprehensive Truck Management Plan—Port of Oakland

The Port of Oakland initiated development of the Comprehensive Truck Management Plan (CTMP) in early 2007 through the establishment of a technical advisory committee. The purpose of the CTMP is to address air quality, safety and security, business and operations, and community issues associated with drayage trucks serving the Port. As part of implementing the CTMP, the Port has developed a truck registry for trucks serving the seaport, supported compliance with truck-related regulations to reduce emissions of air pollutants, increased safety and security domain awareness, improved operational efficiencies, reduced traffic and congestion, and involved and educated stakeholders.

Waterfront Plan Update—Port of San Francisco

The Port of San Francisco's Waterfront Plan, last updated in 2023, addresses environmental sustainability at the port in areas of air, climate, water, land, community, energy, transportation, and buildings. With respect to air quality, the plan identifies multiple strategies and active programs that would reduce emissions from the port. These include implementing shoreside power projects that provide zero-emission power for large ships, using renewable diesel fuel in the port's heavy-duty fleet and equipment, and encouraging port employees to use alternative modes of transportation for commuting.

Clean Air Action Plan—Port of Richmond

The Port of Richmond published its *Clean Air Action Plan* in 2010. The plan presents the port's emissions inventory and emission reduction measures and identifies the emission reductions from both regulatory and voluntary emission reduction measures (e.g., heavy-duty truck idling rules, vessel speed reduction programs). A 2015 progress report found that SO_X and diesel PM emissions between 2010 and 2014 declined by 95% and 90%, respectively, primarily resulting from new regulations from CARB requiring the use of very low sulfur fuel in ocean-going vessels (Port of Richmond 2015).

Vision Plan—Port of Redwood City

The Port of Redwood City completed its 2020 Vision Plan in January 2020. The intent of the plan is to track the port's historical cargo throughput, establish a market forecast of activity at the port, establish land use priorities, prepare for changes in the market, identify operational efficiencies, and achieve sustainability. The plan includes 45 findings and recommendations, two of which could result in air quality improvements (Port of Redwood City 2020):

- Reduce the number of trucks on the road by recommending a regional intermodal network that would carry cargo within the Bay Area and Stockton/Sacramento River System instead of on the highway. Transporting freight along waterways is more efficient per ton of freight than transporting by truck and would also reduce congestion on roadways.
- Propose a feasibility study evaluating the potential for ferry service to Redwood City that would reduce on-road congestion and emissions.

Bay Area Air District

The Bay Area Air District attains and maintains air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the Air District includes the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The Air District also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, the Bay Area Air District adopts rules and regulations. All projects are subject to the Air District's rules and regulations in effect at the time of construction. Specific rules applicable to project construction and operation may include, but are not limited to, the following rules:

- **Regulation 2, Rule 1, General Permit Requirements.** This rule includes criteria for issuance or denial of permits, exemptions, appeals against decisions of the air pollution control officer, and Bay Area Air District actions on applications. This rule also requires that notice must be provided to relevant members of the community prior to approving an application for an authority to construct or permit to operate for a new or modified source located within 1,000 feet of a K–12 school site or an Overburdened Community as defined in Section 2-1-243 and for which a health risk assessment is required under to Section 2-5-401.
- **Regulation 2, Rule 2, New Source Review.** This rule applies to new or modified sources and contains requirements for best available control technology (BACT) and emission offsets. Rule 2 implements federal New Source Review and Prevention of Significant Deterioration requirements.
- **Regulation 6, Rule 1, General Requirements.** Regulation 6 limits the quantity of PM in the atmosphere by controlling emission rates, concentration, visible emissions, and opacity.
- **Regulation 7, Odorous Substances.** Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds. A person (or facility) must meet all limitations of this regulation, but meeting such limitations shall not exempt such person from any other requirements of the Bay Area Air District or State or national law. The limitations of this regulation shall not be applicable until the Bay Area Air District receives odor complaints from 10 or more complainants within a 90-day period, alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel, or residence. When the limits of this regulation become effective, as a result of the citizen complaints described above, the limits shall remain effective until such time as no citizen complaints have been received by the Bay Area Air District for 1 year. The limits of this regulation shall become applicable again if the Air District receives odor complaints from five or more complainants within a 90-day period. Bay Area Air District staff investigate and track all odor complaints it receives and make attempts to visit the site and identify the source of the objectionable odor and assist the owner or facility in finding a way to reduce the odor.
- **Regulation 8, Rule 3, Architectural Coatings.** This rule limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the Bay Area Air District's jurisdiction.

Bay Area Air District developed screening criteria to provide lead agencies and project applicants with a conservative indication of whether a proposed project could result in potentially significant air quality impacts. If all of the screening criteria are met by a proposed project, then the lead agency or applicant would not need to perform a detailed air quality assessment of their project's air pollutant emissions. These screening levels are generally representative of new development on greenfield sites without any form of mitigation measures taken into consideration, and the screening criteria do not account for project design features, attributes, or local development requirements that could also result in lower emissions. For projects that are mixed-use, infill, or proximate to transit service and local services, emissions would be less than the greenfield type project that these screening criteria are based on.

According to the Bay Area Air District CEQA Guidelines (April 2022), if a proposed project meets all of the following construction and operational screening criteria, then the lead agency or applicant would not need to perform a detailed assessment of the proposed project's criteria air pollutant and precursor emissions:

Construction

- The project size is at or below the applicable operational screening level size shown in Table 4-1 of the Bay Area Air District CEQA Guidelines and reproduced as **Table 3.4-5** below.
- All best management practices (see Table 5-2 in Chapter 5, "Project-Level Air Quality Impacts" in the Bay Area Air District CEQA Guidelines) are included in the project design and implemented during construction.
- Construction-related activities would not overlap with operational activities.
- Construction-related activities would not include:
  - demolition,
  - simultaneous occurrence of two or more construction phases (e.g., paving and building construction would occur simultaneously),
  - extensive site preparation (e.g., grading, cut and fill, or earth movement),
  - extensive material transport (e.g., soil import and export requiring a considerable amount of haul truck activity), or
  - stationary sources (e.g., backup generators) subject to Air District rules and regulations.

Operation

- Operational activities would not include stationary engines (e.g., backup generators) and industrial sources subject to Bay Area Air District rules and regulations.
- Operational activities would not overlap with construction-related activities.

Table 3.4-5: Bay Area Air District Criteria Air Pollutants and Precursors Screening Level Sizes

Land Use Category	Land Use Subcategory	Land Use Unit	Construction Screening Level	Operation Screening Level
Commercial	Bank	KSF	452	102
Commercial	General Office Building	KSF	452	765
Commercial	Government (Civic Center)	KSF	452	314
Commercial	Government Office Building	KSF	452	445
Commercial	Hospital	KSF	452	611
Commercial	Medical Office Building	KSF	452	293
Commercial	Office Park	KSF	452	706
Commercial	Pharmacy-Drug Store	KSF	452	89
Commercial	Research & Development	KSF	452	692
Education	Daycare Center	KSF	452	232
Education	School – Elementary	KSF	452	488
Education	School – Junior High	KSF	452	475
Education	School – High School	KSF	452	579
Education	College – Junior (2-year)	KSF	452	426
Education	College – University (4-year)	KSF	452	779
Education	Library	KSF	452	123
Education	Worship Place	KSF	452	642
Industrial	General Heavy Industry	KSF	452	1,009

Land Use Category	Land Use Subcategory	Land Use Unit	Construction Screening Level	Operation Screening Level
Industrial	General Light Industry	KSF	452	998
Industrial	Industrial Park	KSF	452	1,247
Industrial	Manufacturing	KSF	452	1,009
Industrial	Warehouse[1]	KSF	452	1,423
Recreational	Arena	KSF	732	600
Recreational	City Park	Acres	10	175
Recreational	Fast Food Restaurant	KSF	452	21
Recreational	Health Club	KSF	452	261
Recreational	Hotel	Rooms	312	633
Recreational	Motel	Rooms	230	767
Recreational	Movie Theater	KSF	458	80
Recreational	Restaurant – High Turnover (Sit-Down)	KSF	452	75
Recreational	Restaurant – Quality (Fine Dining)	KSF	452	105
Recreational	Racquet Club	KSF	452	457
Recreational	Recreational Swimming Pool	KSF	452	376
Residential	Apartments	DU	416	638
Residential	Condo-Townhouse	DU	416	637
Residential	Mobile Home Park	DU	377	721
Residential	Congregate Care/Retirement Community	DU	416	1,008
Residential	Single Family Housing	DU	254	421
Retail	Automobile Care Center	KSF	452	356
Retail	Convenience Market	KSF	452	11
Retail	Discount Store	KSF	452	150
Retail	Home Improvement Superstore/ Hardware-Paint Store	KSF	452	221
Retail	Regional Shopping Center	KSF	452	221
Retail	Strip Mall	KSF	452	204
Retail	Supermarket	KSF	452	72

Notes: DU = dwelling unit; KSF = thousand square feet.

[1] The use of the warehouse land is not appropriate for a logistics or distribution center. These types of projects should use project-specific traffic data or a more land use-specific trip generation rate.

Source: BAAQMD 2023a.

Northern Sonoma County Air Pollution Control District

NSCAPCD attains and maintains air quality conditions in northern Sonoma County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of NSCAPCD includes the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. NSCAPCD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, NSCAPCD adopts rules and regulations. All projects are subject to NSCAPCD's rules and regulations in effect at the time of construction. Specific rules applicable to project construction and operation may include, but are not limited to, the following rules:

- **Rule 200, Permit Requirements.** This rule establishes permitting processes (i.e., Authority to Construct, Modify, Replace, Operate, or Use) to review new and modified sources of air pollution.
- **Rule 220, New Source Review Standards.** This rule would require any new or modified stationary source that generates emissions that exceed established emissions limits for each pollutant (i.e., ROG, NO_X, SO_X, PM_{10}, carbon monoxide, and lead) to comply with BACT.
- **Rule 400, General Limitations.** This rule prohibits any source from generating air contaminants or other materials that would cause injury, detriment, nuisance, or annoyance to any considerable number of people or to the public; endanger the comfort, repose, health, or safety of any such people or the public; or cause or have a natural tendency to cause injury or damage to business or property.

Yolo-Solano Air Quality Management District

YSAQMD attains and maintains air quality conditions in Yolo and Solano Counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of YSAQMD includes the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. YSAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, YSAQMD adopts rules and regulations. All projects are subject to YSAQMD's rules and regulations in effect at the time of construction. Specific rules applicable to project construction and operation may include, but are not limited to, the following rules:

- **Rule 2.11, Particulate Matter Concentration.** This rule prohibits any source that would emit dust, fumes, or total suspended PM from generated emissions that would exceed the rule's established emission concentration limit.
- **Rule 2.5, Nuisance.** This rule prohibits the discharge of air contaminants or other material from any source in quantities that could cause injury, detriment, nuisance, or annoyance to any considerable number of people or to the public or that endanger the comfort, repose, health, or safety of any such people or the public or which cause to have a natural tendency to cause injury or damage to business or property.
- **Rule 2.14, Architectural Coatings.** This rule establishes VOC content limits for all architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured in YSAQMD's jurisdiction.
- **Rule 2.40, Wood Burning Appliances.** This rule prohibits installation of open-hearth wood-burning fireplaces in any new development (residential or commercial, single- or multifamily units). New developments may use only a pellet-fueled heater, an EPA Phase II certified wood-burning heater, or a gas fireplace.
- **Rule 2.37, Natural Gas–Fired Water Heaters and Small Boilers.** This rule establishes NO_X emission limits for natural gas–fired water heaters with a rated heat input capacity less than 1,000,000 British thermal units per hour manufactured, offered for sale, sold, or installed in YSAQMD's jurisdiction.
- **Rule 3.1, General Permit Requirements.** This rule establishes permitting processes (i.e., Authority to Construct and Permit to Operate) to review new and modified sources of air pollution.

- **Rule 3.4, New Source Review.** This rule would require any new or modified stationary source that generates emissions that exceed established emissions limits for each pollutant (i.e., ROG, NO_X, SO_X, PM_{10}, carbon monoxide, and lead) to comply with BACT and emissions offset requirements.
- **Rule 3.13, Toxics New Source Review.** This rule requires the installation of BACT for toxics at any constructed or reconstructed major source of TACs.

Air Quality Management Plans

Clean Air Plan (Bay Area Air District)

The CCAA requires that all local air districts in the State endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources and provides districts with the authority to regulate indirect sources.

For State air quality planning purposes, the Bay Area is classified as a serious nonattainment area for the 1-hour ozone standard. The "serious" classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan every 3 years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data.

The 2017 Clean Air Plan (adopted April 19, 2017) provides a regional strategy to protect public health and protect the climate. To protect public health, the plan describes how the Bay Area Air District will continue making progress toward attaining all State and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities. To protect the climate, the plan defines a vision for transitioning the region to a postcarbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050 and provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets.

The 2017 plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as PM, ozone, and TACs; reduce emissions of methane and other "super-GHGs" that are potent climate pollutants in the near term; and decrease emissions of carbon dioxide by reducing fossil fuel combustion.

Highlights of the 2017 plan include the following goals and measures (BAAQMD 2017):

- Limit fossil fuel combustion: Develop a regionwide strategy to increase fossil fuel combustion efficiency at industrial facilities, beginning with the three largest sources of industrial emissions: oil refineries, power plants, and cement plants.
- Stop methane leaks: Reduce methane emissions from landfills and from oil and natural gas production, storage, and distribution.
- Reduce exposure to toxics: Reduce emissions of TACs by adopting more stringent limits and methods for evaluating toxic risks at existing and new facilities.
- Put a price on driving: Implement pricing measures to reduce travel demand.
- Advance electric vehicles: Accelerate the widespread adoption of electric vehicles.
- Promote clean fuels: Promote the use of clean fuels and low- or zero-carbon technologies in trucks and heavy-duty vehicles.
- Accelerate the production of low-carbon buildings: Expand the production of low-carbon, renewable energy by promoting on-site technologies, such as rooftop solar and ground-source heat pumps.

- Support more energy choices: Support community choice energy programs throughout the Bay Area.
- Make buildings more efficient: Promote energy efficiency in both new and existing buildings.
- Make space and water heating cleaner: Promote the switch from natural gas to electricity for space and water heating in Bay Area buildings.

Northern Sonoma County Air Pollution Control District

NSCAPCD is in attainment for all criteria air pollutants. It does not currently have and is not required to have an air quality management plan.

Yolo-Solano Air Quality Management District

Criteria Air Pollutants

The CCAA requires districts to submit air quality plans for areas that do not meet State standards for ozone, carbon monoxide, SO_2, NO_2, and PM. YSAQMD has attained all standards with the exception of ozone and PM. Ozone levels in Yolo and Solano Counties are in the healthy range on most days. However, emissions created in Yolo and Solano Counties do affect neighboring communities, especially in the greater Sacramento region. For this reason, YSAQMD is included in the Sacramento federal nonattainment area by EPA. As a nonattainment area for the federal ozone standard, the Sacramento region is required to prepare various planning documents on an ongoing basis.

Specific to YSAQMD, the CCAA requirement is to produce a plan for attaining and maintaining State ambient air quality standards for ozone with subsequent updates every 3 years. YSAQMD's most recent Triennial Assessment and Plan update (examining the years 2015–2017) discussed the progress YSAQMD had made toward improving the air quality in its jurisdiction since its last Triennial Plan. YSAQMD no longer prepares their own triennial plan, but instead works collaboratively with the four other air districts within the Sacramento Federal Nonattainment Area (SFNA) in preparation of the *Sacramento Regional 2015 NAAQS 8-Hour Ozone Attainment & Reasonable Further Progress Plan*, which addresses attainment of the 2015 NAAQS for ozone in the entire SFNA.

Toxic Air Contaminants

The Air Toxics "Hot Spots" Program was enacted by State law (AB 2588) in 1987. The purpose of the law is to provide the public with information about the routine emissions and potential health impacts of toxic pollutants released to the air by facilities. Certain facilities are subject to the program and are required to submit a toxic emissions inventory. With those data, YSAQMD calculates a prioritization score for each facility. Depending on the prioritization score, some facilities are required to perform a health risk assessment.

YSAQMD's Air Toxics Hot Spots Program requires certain facilities with the potential to emit certain amounts of toxic air pollutants to submit emissions inventories to YSAQMD and, in some cases, pursue risk reduction strategies. The program is intended to provide the public with information about potential health impacts from toxic air pollutants routinely emitted by facilities.

City and County General Plans

The most comprehensive land use planning for the San Francisco Bay Area region is provided by city and county general plans, which local governments are required by State law (California Government Code Section 65300 et seq.) to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by State law or that the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address include public facilities, parks and recreation, community design, natural resources, healthy communities, energy and sustainability, air quality, and growth management. Except for the San Joaquin Valley area, air quality is an optional general plan topic.

Jurisdictions may choose to consider air quality as a stand-alone topic, as part of another mandatory or optional element, or not at all. Local planning policies related to air quality often address exposure to air pollutants, public health, density, compact development, alternative transportation modes, energy conservation, cleaner-fuel vehicles, emissions reduction, and public education, among other topics.

3.4.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in EIR for the Plan Bay Area 2050, the Bay Area Air District's CEQA Guidance for plan-level analyses, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- conflict with or obstruct implementation of the applicable air quality plan (Criterion AQ-1);
- result in a net increase in construction-related emissions (Criterion AQ-2);
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard (Criterion AQ-3);
- expose sensitive receptors to substantial pollutant concentrations (Criterion AQ-4); or
- result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (Criterion AQ-5).

Note that NSCAPCD and YSAQMD do not currently have officially recommended significance thresholds for regional plans. The Bay Area Air District's updated CEQA Guidelines (updated April 2022) are intended to help lead agencies navigate through the CEQA process. The guidelines for implementation of the thresholds are for information purposes only to assist local agencies. Recommendations in the guidelines are advisory and should be followed by local governments at their own discretion. These guidelines may inform environmental review for development projects in the Bay Area, but do not commit local governments or the Bay Area Air District to any specific course of regulatory action. The guidelines offer step-by-step procedures for a thorough environmental impact analysis of adverse air emissions due to land development in the Bay Area. Given that most of the plan area is within the Bay Area Air District's jurisdiction and that Bay Area Air District guidance represents the most stringent thresholds available from the applicable air districts (i.e., Bay Area Air District, NSAPCD, and YSAQMD), this analysis uses the Bay Area Air District's thresholds in the evaluation of potentially significant adverse impacts related to implementation of the proposed plan.

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on air quality based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint). The baseline for this analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025. However, impacts relying on analysis from Travel Model 1.6 (e.g., VMT), reflect an existing conditions baseline using 2023 data because it is the most recent year for which comprehensive land use, demographic, transit ridership, and traffic volumes are available for the Bay Area region. Data reflecting existing concentrations in the year 2023 were used for the existing conditions baseline because of the potential for new land uses under the proposed plan to be constructed at any point between the plan's adoption and 2050.

This evaluation of air quality impacts assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist, it is reasonable to assume that they would be implemented, thereby reducing impacts.

Construction-Related Emissions

Construction emissions can vary depending on the level of activity, the specific operations taking place, the equipment being operated, local soil conditions, weather conditions, and other factors. A qualitative analysis of potential local and regional air quality impacts from construction activity associated with proposed plan investments was conducted. At the program level of analysis, it is not possible to quantify the amount of emissions expected from construction of the transportation projects or land use development that would be consistent with the proposed plan. However, the overall impact on local and regional air quality from construction emissions associated with any one project or all projects combined would be primarily dependent on the quantity, age, and fuel type of the construction equipment and the duration of their operation at the construction site or in the region. Also, individual land use and transportation projects associated with implementation of the proposed plan, depending on their size, may exceed the thresholds for short-term construction criteria air pollutant emissions, especially if best management practices (BMPs) are not implemented.

Operational Criteria Air Pollutant and Precursor Emissions

This analysis addresses the effect of the forecasted development pattern and transportation projects under the proposed plan on air quality. Much of the housing growth and job growth is expected to occur around the plan area's transit network (e.g., BART, Caltrain) in Santa Clara, San Francisco, Alameda, and San Mateo Counties. With more limited transit access, the North Bay counties of Marin, Napa, and Sonoma, as well as Solano are expected to take on a much smaller share of regional growth. Note that, due to the uncertainty surrounding P.L. No. 119-16 and P.L. No. 119-17 and California's legal challenge to this federal law, a more conservative emissions modeling approach (than EMFAC2025 which assumed lower future emissions) was selected, and this is explained further below, under the heading "Motor Vehicle Emissions." The changes in land use travel activity under existing conditions using 2023 data and 2050 conditions projected under the proposed plan using both EMFAC2017 and EMFAC2021 estimates are summarized in **Table 3.4-6** and **Table 3.4-7** to provide an estimated range of emissions.

Table 3.4-6: Bay Area Travel Activity Data (EMFAC2021)

	2023, Baseline	2050, Proposed Plan	Change (2023 to 2050) Numerical	Change (2023 to 2050) Percent
Total Population	7,465,000	9,599,000	2,134,000	29%
Employed Residents	3,817,000	5,160,000	1,343,000	35%
Vehicles in Use	4,042,000	5,238,000	1,196,000	30%
Engine Starts	20,495,000	26,778,000	6,283,000	31%
Daily VMT	148,886,000	181,222,000	32,336,000	22%

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, above 1,000,000 to the nearest 1,000). Number of vehicles in use, engine starts, and Daily VMT forecasts do not account for expected reductions from the implementation of Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 3.4-7: Bay Area Travel Activity Data (EMFAC2017)

	2023, Baseline	2050, Proposed Plan	Change (2023 to 2050) Numerical	Change (2023 to 2050) Percent
Total Population	7,465,000	9,599,000	2,134,000	29%
Employed Residents	3,817,000	5,160,000	1,343,000	35%
Vehicles in Use	4,258,000	6,297,000	2,038,000	48%
Engine Starts	21,246,000	31,184,000	9,938,000	47%
Daily VMT	148,886,000	181,222,000	32,336,000	22%

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, above 1,000,000 to the nearest 1,000). Number of vehicles in use, engine starts, and Daily VMT forecasts do not account for expected reductions from the implementation of Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Land Use

Because project-specific information such as individual land use size and building design features, are unknown at this programmatic stage, land use emissions from sources such as building energy and area sources are assessed qualitatively using statewide and regional emissions inventories and trends. Moreover, while the plan includes a comprehensive map that directs growth to urbanized areas to reduce regional passenger VMT to meet the targets of SB 375, the plan does not, itself, induce growth to the MTC and ABAG plan area. Rather, the plan has been prepared in response to projected employment and population growth in the MTC and ABAG plan area and intentionally focuses growth to mitigate VMT impacts. Consequently, emissions produced from the construction and operation of new land use development could occur regardless of implementation of the plan. Therefore, the plan's contribution of emissions to the San Francisco Bay Area Air Basin is assessed qualitatively.

Area-source emissions consist of ROG, NO_X, PM_{10}, and $PM_{2.5}$ generated by a variety of sources, including natural gas combustion for space and water heating; consumer products, such as cleaning solutions and hair products; and landscaping equipment. With respect to wood-burning activities, as of November 2016, the Bay Area Air District prohibits any wood-burning devices, such as wood-burning fireplaces or stoves, from being installed in new construction under Bay Area Air District Regulation 6, Rule 3, Section 6-3-306. Thus, it was assumed that any new construction would not operate wood-burning stoves and any new fireplaces would combust natural gas instead of wood.

It is foreseeable that future project-level assessments of land use development projects may determine land use impacts to be significant or less than significant, depending on size and project design commitments; however, at this programmatic level, these levels of emissions cannot be quantified with a high degree of certainty.

Motor Vehicle Emissions

Motor vehicle, or mobile source, emissions were calculated using MTC's travel demand forecasting model, Travel Model 1.6, and mobile source emission factors developed by CARB. Travel Model 1.6 produces forecasts of travel behavior and vehicle activity for the proposed plan's base year, 2023, the data from which is also used to define the existing conditions baseline, and 2050. Travel Model 1.6 has been extensively reviewed by federal and State agencies and refined in connection with the application to air quality analyses of various kinds. Key model outputs for use in air quality analyses include total daily vehicle trips, VMT, and distribution of VMT by speed. This information was then used to determine total emissions from transportation activity in the Bay Area using motor vehicle emission factors from CARB's EMFAC model.

Vehicle activity projections are correlated to changes in demographic, housing, and socioeconomic factors. For calculations relying on outputs from Travel Model 1.6 and population totals (i.e., per capita VMT or per capita energy use), model-simulated population levels were used to ensure consistency.

Simulated population may be slightly different than overall population forecasts for the proposed plan and alternatives due to slight variability in modeling tools (please refer to Chapter 1, "Introduction," for an explanation of the different modeling tools). As identified in Section 3.4.2, "Regulatory Setting," several of California's waivers for mobile source regulations under the CAA have been rescinded following Congressional action. While the California Attorney General has filed lawsuits challenging P.L. No. 119-16 and P.L. No. 119-17, the implications of these laws on the State's capability to enforce its independent fuel economy standards are uncertain at this time because litigation is still pending. However, if P.L. No. 119-17 remains in place, air pollution emissions in California will be substantially higher than if California continued to implement its own fuel economy standards under the CAA and in effect prior to the Congressional recission. CARB has not provided guidance, to date, on how to address these uncertainties in using its EMFAC modeling.

In an effort to account for a range of potential scenarios, depending on whether the State is able to implement its own stricter emissions standards in the future, a range of mobile source emissions estimates were calculated for the proposed plan. Although the Bay Area Air District requested use of EMFAC2025, the most recently developed mobile source emissions model, in its response to the Notice of Preparation, MTC anticipates that this may result in underestimating future emissions if the recission remains. MTC further anticipates that CARB will recommend off-model adjustments to EMFAC2021 to account for a scenario in which the recission remains in place, but no guidance has been issued at the time of this analysis. Therefore, older emissions models, which do not assume termination of gas engine vehicle sales by 2035, for instance, were used to determine project-related impacts. Emissions were calculated using both EMFAC2017 and EMFAC2021, in combination with equivalent model versions of CT-EMFAC (the California Department of Transportation ([Caltrans]) model based on data derived from CARB's EMFAC model and ancillary data sets. Therefore, the analyses in this EIR do not account for ACC II because ACC II had not yet been adopted at the time the EMFAC2017 and EMFAC2021 methodologies were last updated and thus were not factored into the modeling. See Appendix D for details regarding the various state and federal laws, regulations, and legislative actions accounted for in EMFAC2017 and EMFAC2021. Because EMFAC2021 applies emissions reductions based on more recent mobile source emissions regulations, emissions calculated using EMFAC2021 are considered a less conservative estimate of emissions. Calculations made using EMFAC2017 provide a more conservative (higher level) estimate of emissions because EMFAC2017 includes emissions reduction estimates based on older, less stringent mobile-source emissions regulations. Notably, EMFAC2021 assumes implementation of the Low NO_X rule and EIR mobile source emissions thus do not account for the June 12, 2025, disapproval of the Low NO_X rule. Despite this, EMFAC2021 remains the current federally-approved model for estimating emissions in California and there is legal uncertainty regarding the enforceability of the federal disapproval of these regulations. Given these considerations, use of EMFAC2017 and EMFAC2021 to estimate a range of potential impacts are considered more conservative methodologies than relying on EMFAC2025, as requested by the Bay Area Air District, to calculate mobile source emissions. As stated above, it is anticipated that CARB will recommend adjustments to the EMFAC2021 model to account for the uncertainty in the regulatory landscape as it is related to transportation-related regulations. The range of emissions calculated using EMFAC2017 and EMFAC2021 is intended to provide a range between which project-generated emissions estimated using the adjusted EMFAC2021 model would likely fall.

As shown in both **Table 3.4-6 and Table 3.4-7**, between 2023 and 2050 (the planning horizon for the proposed plan), the Bay Area is projected to add about 2.1 million people (a 29% increase) and 1.3 million employed residents (a 35% increase). According to expected future growth, the total daily VMT in the region would increase by 22%. The results presented in **Table 3.4-6** and **Table 3.4-7** do not account for implementation of Strategy EN9, "Expand Transportation Demand Management Initiatives," due to limitations that do not allow for the distribution of the VMT reductions by speed and county, key model outputs for emissions analyses. As a result, the mobile source emissions in the following analyses are overstated.

EMFAC2017 and EMFAC2021 generate emission factors for all types of on-road vehicles in different seasons and driving conditions. CARB developed these factors based on thousands of emissions tests on both new and used vehicles recruited randomly from the California fleet. In both EMFAC models, the emission rates were combined with vehicle activity data provided by regional transportation agencies (such as MTC) to calculate the regional emissions inventories. Emission estimates for ROG, NO_X, CO, and PM (associated with engine exhaust and tire wear) are direct outputs from EMFAC2017 and EMFAC2021.

Entrained road dust emissions (PM) were calculated following the Bay Area Air District's recommended approach outlined in Air Quality Guidelines – *Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards*. This method is based on CARB's 2021 guidance and accounts for a range of site-specific and operational factors, including:

- Road surface silt loading, determined by roadway type,
- Fleet average vehicle weight, estimated at the county level based on local fleet composition,
- Local precipitation data, aggregated at the county level to determine the number of wet days that reduce dust generation, and
- Hourly vehicle miles traveled (VMT) on each roadway segment.

Emissions are estimated for each roadway link by applying the calculated emission factor to hourly VMT and summing over the 24-hour day. This produces a spatially and temporally resolved inventory of PM emissions from entrained road dust.

Toxic Air Contaminants

TACs were evaluated on both a regional and local level. The regional analysis studies the impacts of the cumulative TAC emissions in the entire plan area; the local analysis studies the impacts of TAC emissions that disproportionally impacted communities to provide a better understanding of localized health impacts. The methodologies for regional and localized TACs analyses are described separately below along with a description of the specific methods used for each emissions source.

Regional TAC Levels

To calculate TACs from all on-road motor vehicles, emissions are estimated for each roadway link in the travel model network by multiplying forecasted volumes by emission rates. These calculations are performed separately for each time period (e.g., AM peak, midday, PM peak) and then aggregated to produce a daily regional total. Travel activity data was sourced from Travel Model 1.6, while emission rates were based on CT EMFAC—the California Department of Transportation's adaptation of CARB's EMFAC model. Travel activity data from Travel Model 1.6 and emission rates from CalTrans's CT-EMFAC2017 and CT-EMFAC2021 models are based on data derived from their corresponding CARB EMFAC models (i.e., EMFAC2017 and EMFAC2021) and ancillary data sets. CT-EMFAC2017 forecasts on-road vehicle emissions for criteria pollutants, TACs, GHG emissions, and fuel consumption.

Local TAC Concentrations and Associated Levels of Health Risk Exposure

The purpose of the local pollutant impact analysis is to assess potential localized health impacts to sensitive receptors based on the transportation projects and the projected growth in the proposed plan. The Bay Area Air District's 2022 CEQA Air Quality Guidelines define sensitive receptors as "facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals and residential areas." SB 375 and the proposed plan promote residential and commercial/retail development along existing transit corridors and in urbanized areas to reduce vehicle trips, VMT, and mobile source air pollution. Although this approach is beneficial to air quality in general by reducing the mass of air pollution emitted regionally, sensitive receptors located in proximity to sources of TACs and

$PM_{2.5}$ can be exposed to serious adverse health effects. Urbanized areas typically contain a wide range of TAC and $PM_{2.5}$ sources that can create localized health risks to residents and other sensitive receptors from prolonged exposure to elevated concentrations. Such sources include stationary and area sources (e.g., gas stations, manufacturing facilities) and mobile sources (e.g., cars, trucks, trains).

This program-level EIR evaluates potential impacts on air quality based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., the land use growth footprint) relative to the known distribution of sensitive receptors in the Bay Area.

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county). Information provided by county includes both incorporated and unincorporated areas in the county.

For this impact assessment, a geographic information system (GIS) was used to digitally overlay the proposed plan's land use growth footprint associated with the forecasted development pattern onto the location of communities and places throughout the region which the Bay Area Air District estimated to have elevated levels of fine particulates or TACs.

The land use growth footprint is derived from the UrbanSim 2.6 land use model and represents the development or redevelopment of parcels of land simulated to accommodate the region's forecasted growth of households and jobs from 2023 through 2050 through new buildings. Precise building sites on the parcels are not known; therefore, the land use growth footprint incorporates the entire parcel. Because of this assumption, the area of potential effects tends to be overstated when considering the land use growth footprint.

Analysis of TAC and $PM_{2.5}$ in Disproportionally Impacted Communities

Some locations in the plan area are exposed to higher concentrations of TACs and $PM_{2.5}$ than other areas. Areas of higher exposure tend to be located along major transportation and goods movement corridors and areas with lower household incomes. Communities in these areas are, therefore, more vulnerable to the harmful effects of air pollution. As a result, these areas experience higher rates of adverse health outcomes. The effects of the proposed transportation projects and projected land use growth are evaluated to determine whether communities that are already disproportionally impacted would be exposed to an increase or decrease in TAC and $PM_{2.5}$ emissions.

Overburdened Communities

An Overburdened Community is defined in Bay Area Air District Rule 2-1-243 as "[a]n area located (i) within a census tract identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0, as having an overall CalEnviroScreen score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract." This Draft EIR identifies potential impacts in Overburdened Communities because these areas have been identified as those with the highest existing concentrations of TACs and $PM_{2.5}$ and are currently disproportionately impacted in comparison to other communities in the plan area. MTC's evaluation of the proposed plan's transportation investments and strategies on Equity Priority Communities is addressed in the Equity Analysis Report found at https://planbayarea.org/draftplan, prepared as a supplemental report to the proposed plan.

In addition, the Bay Area Air District developed the Planning Healthy Places process to conduct local modeling of potential impact areas of air pollution in finer spatial detail (with grid sizes down to 20 meters by 20 meters), as opposed to the region-level assessment. Modeling work presented in Planning Healthy Places identified areas in proximity to roadways with high traffic volume and major pollutant sources, such as refineries. For these identified areas, the Bay Area Air District recommends either further study or a list of BMPs depending on the level of exposure and type of emission source (BAAQMD 2016).

Motor Vehicle Emissions

Travel activity data for the roadway network were derived from MTC's travel demand forecasting model, Travel Model 1.6. The model forecasts VMT, along with daily vehicle trips and distribution of VMT by speed. This data is then imported into EMFAC2017 and EMFAC2021 to obtain emissions data.

In its analysis, MTC modeled regional impacts from VMT on all links in the network and used a separate methodology to assess impacts to Overburdened Communities. This approach is consistent with the Plan Bay Area 2050 EIR and the approach that was developed by MTC's Equity Analysis workgroup. MTC used a GIS to digitally overlay the Overburdened Communities onto Travel Model 1.6's roadway links to identify the roadway links that run through Overburdened Communities and non-Overburdened Communities that meet these criteria. TAC and $PM_{2.5}$ emissions were then estimated for Overburdened Community and non-Overburdened Community roadway links in each county. For example, the emission estimates for Overburdened Communities in Contra Costa County reflect vehicle activity on the roadway links in the Concord and Richmond/San Pablo Overburdened Communities.

TAC Emission Sources

The following sections describe the types of TAC emission source impacts analyzed in this EIR.

High Traffic Roadways

This source includes all roadways that carry more than 30,000 vehicles per day. Cancer risk levels and $PM_{2.5}$ concentrations were modeled using travel activity data (from MTC's travel demand forecasting model, Travel Model 1.6) along each roadway link and area-specific meteorological data.

Railroads

The Bay Area Air District modeled emissions using activity data for Amtrak, Caltrain, SMART rail, eBART, and ACE passenger lines. Fuel-based emissions along freight lines were provided by Union Pacific and BNSF rail lines.

Ferry Terminals

Buffer distances for ferry terminals were developed by extrapolating modeling results from excursions vessels departing San Francisco.

Large and Complex Sources

Large and complex sources, for example, oil refineries or seaports, can emit relatively high levels of TACs and fine PM. There are typically numerous emission sources within each of these facilities, making it difficult to characterize the specific local variations of concentrations of TACS and fine PM in the surrounding community (BAAQMD 2023b).

Stationary Sources

Stationary sources include sources permitted by the Bay Area Air District, such as refineries, gas stations, backup generators, and automobile body shops. Screening analyses for cancer risk and $PM_{2.5}$ exposures from stationary sources were conducted in accordance with the Bay Area Air District CEQA Guidelines (BAAQMD 2023b).

IMPACTS AND MITIGATION MEASURES

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan (LTS)

The Bay Area Air District's 2017 Clean Air Plan is a multi-pollutant plan focused on two closely related goals: (1) protecting public health and (2) protecting the climate. To fulfill State ozone planning requirements, the control strategy includes all feasible measures to reduce emissions of ozone precursors—ROG and NO_x—

and reduce transport of ozone and its precursors to neighboring air basins. In addition, the plan builds upon and enhances the Air District's efforts to reduce emissions of $PM_{2.5}$ and TACs.

The control strategy, which serves as the backbone of the 2017 Clean Air Plan, builds upon existing regional, State, and national programs that have successfully reduced air pollution and improved public health over the past several decades. The control strategy includes an integrated set of control measures designed to:

- reduce ozone precursors, in order to fulfill California Health and Safety Code ozone planning requirements;
- protect public health by reducing emissions of ozone precursors, PM TACs; and
- serve as a regional climate protection strategy by reducing GHG emissions across the full range of economic sectors.

The 2017 Clean Air Plan's comprehensive control strategy includes 85 control measures with some measures focusing on reducing a single type of air pollutant. Many of the measures, however, reduce multiple pollutants and serve both to protect public health and to protect the climate. The control strategies in the 2017 Clean Air Plan recognize the need to reduce motor vehicle travel and emissions by integrating transportation, land use, and air quality planning. Cleaner fuels and improved emission controls have substantially reduced emissions from mobile sources in recent decades. However, growth in motor vehicle use (as measured in VMT on both a per-capita and an absolute basis) has offset some of the benefit of the improved emission controls. This increase in VMT has been caused or facilitated, in part, by dispersed development patterns that result in increased dependency on motor vehicles and by population and job growth. The 2017 Clean Air Plan encourages future population and job growth in areas that are well served by transit and where mixed-use communities provide jobs, housing, and retail in close proximity.

Key themes embedded in the 2017 Clean Air Plan include:

- the need to reduce motor vehicle emissions by driving cleaner, driving smarter, and driving less;
- reducing per-capita VMT and promoting policies that enable families to reduce their motor vehicle ownership;
- designing communities where people can walk, bike, or use transit on a convenient basis; and
- ensuring that focused growth in priority areas is planned and designed to protect people from both existing sources and new sources of emissions.

The following discussion presents the impacts associated with build-out of the proposed plan (i.e., the totality of all future regional growth and land use change, sea level rise adaptation, and transportation system projects under the proposed plan) and is essentially a cumulative analysis of the proposed plan. Due to the inherently cumulative nature of air quality impacts (excluding the localized nature of odor and TAC impacts), the analysis below evaluates air quality impacts based on the collective construction and operational emissions from buildout of the land use growth footprint, sea level rise adaptation projects, and transportation system projects under the proposed plan.

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Operation

The proposed plan's core "focused growth" approach for leveraging the plan's strategies discussed in Chapter 2, "Project Description," aligns with the four key themes embedded in the 2017 Clean Air Plan, identified above. This core approach of the proposed plan is intended to "focus growth" into existing communities along the existing transportation network to achieve key regional economic, environmental,

and equity goals by building upon existing community characteristics, leveraging existing infrastructure, while reducing effects on areas with less low-density development.

In addition, many of the proposed plan's 35 integrated housing, economic, transportation, and environmental strategies align and would help implement many of the 85 control measures in the 2017 Plan control strategy. Applicable land use control measures of the 2017 Clean Air Plan are listed below:

- EN2: Decrease Energy Use. This measure focuses on decreasing energy use in the Bay Area by (1) increasing consumer awareness about energy efficiency through education and outreach and (2) tracking electricity use.
- BL1: Green Buildings. This control measure would increase energy efficiency and the use of on-site renewable energy—as well as decarbonize existing end uses—for all types of existing and future buildings. The measure includes policy assistance, incentives, diffusion of public information, and targeted engagement and facilitation of partnerships in order to increase energy efficiency and on-site renewable energy in the buildings sector.
- BL2: Decarbonize Buildings. This control measure would reduce GHG emissions, criteria pollutants, and TACs by limiting the installation of space- and water-heating systems and appliances powered by fossil fuels. This measure will be implemented by developing model policies for local governments that support low- and zero-carbon technologies, as well as potentially developing a rule limiting the sale of natural gas furnaces and water heaters.
- BL4: Urban Heat Island Mitigation. This control measure in intended to reduce the "urban heat island" phenomenon by increasing the application of "cool roofing" and "cool paving" technologies, as well as increasing the prevalence of urban forests and vegetation, through voluntary approaches and educational outreach.

Applicable transportation control measures of the 2017 Clean Air Plan are listed below:

- TR1: Clean Air Teleworking. The primary objective of the Clean Air Teleworking measure is to increase the number of employees who telework in the Bay Area, especially on Spare the Air days, by providing outreach and assistance to employees and employers.
- TR2: Trip Reduction Programs. The Trip Reduction Programs measure includes a mandatory and voluntary trip reduction program. The regional Commuter Benefits Program, resulting from SB 1339, and similar local programs in jurisdictions with ordinances that require employers to offer pretax transit benefits to their employees are mandatory programs. Voluntary programs include outreach to employers to encourage them to implement strategies that encourage their employees to use alternatives to driving alone.
- TR3: Local and Regional Bus Service. The Local and Regional Bus Service improvements control measure will improve existing transit service on the region's core transit systems and include new bus rapid transit lines in San Francisco, Oakland, and Santa Clara County.
- TR4: Local and Regional Rail Service Improvements. This measure will improve rail service by sustaining and expanding existing services and by providing funds to maintain rail cars, stations, and other rail capital assets. Specific projects for implementation include BART extensions, Caltrain electrification, Transbay Transit Center building and rail foundation, Capital Corridor intercity rail service, and Sonoma Marin Area Rail Transit (SMART) District commuter rail project.
- TR5: Transit Efficiency and Use. This measure will improve transit efficiency and make transit more convenient for riders through continued operation of 511 Transit, full implementation of Clipper® fare payment system, and the Transit Hub Signage Program.

- TR6: Freeway and Arterial Operations. This measure improves the performance and efficiency of freeway and arterial systems through operational improvements, such as implementing the Freeway Performance Initiative, the Bay Area Freeway Service Patrol, and the Arterial Management Program.
- TR7: Safe Routes to Schools and Transit. This measure will facilitate safe routes to schools and transit by providing funds and working with transportation agencies, local governments, schools, and communities to implement safe access for pedestrians and cyclists. Likely projects will include implementation of youth outreach and educational programs to encourage walking and cycling, the construction of bicycle facilities, and improvements to pedestrian facilities.
- TR8: Ridesharing and Last-Mile Connections. The Ridesharing and Last-Mile Connections measure will promote ridesharing services and incentives through the implementation of the 511 Regional Rideshare Program, as well as local rideshare programs implemented by congestion management agencies. These activities will include marketing rideshare services, operating a rideshare information call center and website, and providing vanpool support services. In addition, this measure includes provisions for encouraging car sharing programs.
- TR9: Bicycle and Pedestrian Access and Facilities. The bicycle component of this measure will expand bicycle facilities serving employment sites, educational and cultural facilities, residential areas, shopping districts, and other activity centers. Typical improvements include bike lanes, routes, paths, and bicycle parking facilities. The bicycle component also includes a bike-share pilot project that was developed to assess the feasibility of bicycle sharing as a first- and last-mile transit option.
- TR10: Land Use Strategies. Local land use decisions can directly and indirectly affect air quality and GHG emissions, as well as people's exposure to TACs. This measure supports land use patterns that reduce VMT and associated emissions and exposure to TACs, especially within infill locations and affected communities.
- TR11: Value Pricing Strategies. This measure will pursue implementation of value pricing strategies, such as tolling on transbay bridges and cordon pricing on roads, as well as automobile pricing options, such as a VMT fee and pay at-the-pump auto insurance.
- TR13: Parking Policies. Parking policies and practices have a profound impact on vehicle travel and mode choice, as well as land use patterns and the quality of the built environment. Parking policies are also an important tool in implementing focused growth strategies. This control measure outlines how MTC and the Air District, in cooperation with regional agency partners, will (1) take actions at the regional level to implement parking policies that will benefit air quality, and (2) encourage and support local agency parking policies to reduce motor vehicle travel and promote focused growth.
- TR14: Cars & Light Trucks. This control measures summarizes actions by the Air District, MTC, local businesses, city and county governments, and State and federal agencies to expand the use of ZEVs and plug-in electric vehicles (PEVs), consisting of both battery electric and plug-in hybrid passenger vehicles and light-duty trucks, in the Bay Area.
- TR15: Public Outreach. The Public Outreach control measure includes activities to encourage Bay Area residents to make choices that benefit air quality. This measure includes various public outreach campaigns to educate the public about the health effects of air pollution and the air quality benefits of reducing automobile trips and choosing transportation modes that reduce motor vehicle emissions. The measure includes outreach and education regarding electric vehicles, smart driving, carpooling, vanpooling, use of public transit, biking, walking, and telecommuting.
- TR16: Indirect Source Review. An indirect source review rule would reduce construction and operating emissions associated with new or modified land uses in the Bay Area. The Indirect Source Review measure is intended to address potential increases in air pollutant emissions related to economic and population growth in the region. Indirect sources are development projects that generate or attract

automobile trips and thus "indirectly" cause air pollution from automobiles and area sources. Area source emissions include fireplaces, home heating furnaces, hot water heaters, and landscape maintenance equipment.

- TR18: Goods Movement. The Goods Movement measure includes regional programs to reduce emissions associated with goods movement including funding for goods movement–related infrastructure, planning work to update the Regional Goods Movement Plan, and participation in the regional Goods Movement Collaborative. Goods movement is a critical component of the Bay Area's economic and transportation system and a significant source of air pollutant emissions. Exposure to diesel PM from goods movement disproportionately affects the health of residents near ports, railyards, distribution centers, and roads with high truck volumes. Investing in the Bay Area's trade corridors will address existing air quality and public health issues, as well as help the region to prepare for continued growth in this economic sector.

Table 3.4-8 below cross references the proposed plan's housing, economic, and environmental strategies to relevant control measures in the 2017 Clean Air Plan.

Table 3.4-8: Proposed Plan Land Use Strategies and 2017 Clean Air Plan Control Measures

Proposed Plan Strategy	Relevant Control Measures in 2017 Clean Air Plan
Strategy H3: Allow a Greater Mix of Housing Densities and Types in Growth Geographies. Allow a mix of housing types at a range of densities and in a variety of building configurations to be built in Priority Development Areas, select High-Resource Areas, and select Transit-Rich Areas, including areas where the Transit-Oriented Communities Policy applies, augmented by streamlined review and reduced parking requirements for affordable homes, as well as building code updates.	TR10
Strategy H4: Build Adequate Affordable Housing to Ensure Homes for All. Construct enough deed-restricted affordable homes to fill the existing gap in housing for the unhoused community and to meet the needs of low-income households; provide easy-to-access funding for projects that leverage public or discounted private land, utilize streamlined entitlements, commit to efficient design and delivery measures; support a greater variety of building types, construction technologies and ownership models.	BL1, BL2, BL4, TR10, EN2
Strategy H6: Transform Aging Malls and Office Parks into Neighborhoods. Permit and promote the reuse of shopping malls and office parks with limited commercial viability as neighborhoods with housing for residents at all income levels, including locally-designated Priority Sites.	BL1, BL2, BL4, TR10, EN2
Strategy H7: Provide Targeted Mortgage, Rental, and Small Business Assistance to Equity Priority Communities. Provide assistance to low-income communities and communities of color to address the legacy of exclusion and predatory lending, while helping to grow locally owned businesses.	BL1, BL2, BL4, TR10, EN2
Strategy H8: Accelerate Reuse of Public and Community-Owned Land for Mixed-Income Housing and Essential Services. Help public agencies, community land trusts and other nonprofit landowners accelerate development of 100% affordable and mixed-income housing, supportive services, and public spaces, including on locally-designated Priority Sites; offer easy-to-access funding to projects that commit to streamlined entitlement and innovative design and delivery.	BL1, BL2, BL4, TR10, EN2
Strategy EC3: Invest in High-Speed Internet in Underserved Low-Income Communities. Provide direct subsidies and construct public infrastructure to ensure all communities have affordable access to high-speed internet.	TR1

Proposed Plan Strategy	Relevant Control Measures in 2017 Clean Air Plan
Strategy EC4: Allow Greater Commercial Densities in Growth Geographies. Allow greater mix of commercial, civic, cultural, and other active land uses in select PDAs and select TRAs to revitalize downtowns and main streets, and to support transit recovery.	TR10
Strategy EC5: Provide Incentives to Employers to Shift to Locate in Low-VMT Areas. Provide targeted investments and incentives to encourage employers that offer middle-wage, in-person jobs to locate in low-VMT areas, prioritizing those that are transit-rich and/or housing-rich, including Key Regional Hubs.	TR5, TR10
Strategy EC6: Retain and Invest in Key Industrial Lands. Implement local land use policies to protect key industrial lands identified as PPAs, while funding key infrastructure improvements in these areas.	TR10
Strategy T1: Restore, Operate, and Maintain the Existing System. Commit to operate and maintain the Bay Area's roads and transit infrastructure while transitioning to zero-emission transit vehicles restoring transit service hours to 2019 levels.	TR3, TR4, TR5, TR6
Strategy EN2: Provide Means-Based Financial Support to Retrofit Existing Residential Buildings. Adopt building ordinances and incentivize retrofits to existing buildings to meet higher seismic, wildfire, and ADA accessibility standards, providing means-based subsidies to offset associated costs.	BL1, BL2, EN2
Strategy EN3: Provide Means-Based Financial Support for Energy Decarbonization and Water Efficiency Upgrades in All Buildings. Provide financial support to reduce barriers to the conversion of Bay Area buildings to electric, energy efficient, and water efficient properties.	BL1, BL2, EN2
Strategy EN4: Maintain Urban Growth Boundaries. Use urban growth boundaries to focus new development within the existing urban footprint or areas otherwise suitable for growth, as established by local jurisdictions.	TR10
Strategy EN5: Protect and Manage High-Value Conservation Lands. Protect and preserve high-priority natural and working lands improving the resilience and connectivity of the region's biodiversity and the sustainability and vibrance of the agricultural sector.	TR10
Strategy EN6: Expand Urban Greening in Communities. Invest in quality parks, trails, tree canopy, and urban greening, providing recreation opportunities for people from all backgrounds, abilities, and ages to enjoy.	TR10
Strategy EN7: Expand Commute Trip Reduction Programs at Major Employers. Set a sustainable commute target for major employers as part of an expanded Bay Area Commuter Benefits Program, with employers responsible for funding incentives and disincentives to shift auto commuters to any combination of work-from-home, transit, walking, and/or bicycling.	TR1, TR2, TR8, TR9, TR15
Strategy EN8: Expand Clean Vehicle Initiatives. Expand investments in clean vehicles, including electric vehicles and electric mobility options, and charging infrastructure subsidies, to accelerate the transition from conventional vehicles.	TR14
Strategy EN9: Expand Transportation Demand Management Initiatives. Expand investments in transportation demand management programs to reduce driving demand and encourage active and shared transportation choices, such as vanpools, bikeshare, carshare, and transit.	TR2, TR8, TR11, TR13, TR14

Notes: PDA = Priority Development Area; TRA = Transit-Rich Area; PPA = Priority Production Area; VMT = vehicle miles traveled.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The proposed plan supports the 2017 Clean Air Plan in a variety of areas by providing a long-term transportation funding strategy, allocating housing construction funds, and defining a strategy to meet the GHG reduction goals for cars and light trucks established by CARB under to SB 375 (discussed above).

The proposed plan pursues the region's goals through a strategy to direct the region's future housing needs to Priority Development Areas (PDAs), while protecting open space, scenic areas, and agricultural lands that face near-term development pressure through Priority Conservation Areas (PCAs). In addition to reducing development pressure on the region's open space, this "focused growth" approach would place development near existing transit facilities and encourage more balanced jobs and housing ratios to reduce commute distances. In addition to changes in land use and transportation investments, the proposed plan includes a number of complementary policies and programs designed to provide additional reductions in vehicle travel and GHG emissions from on-road vehicles.

Consistent with the 2017 Clean Air Plan, a primary objective of the proposed plan is to reduce mobile-source GHG emissions through reductions in per-capita VMT. Reducing VMT would lead to direct reduction in transportation-related air quality pollutants emitted by automobiles. Additionally, reducing GHG emissions may further improve local air quality. Atmospheric warming associated with GHG emissions and climate change have the potential to increase ground-level ozone in many regions, which may present challenges for compliance with the ozone standards in the future. The impact of GHG emissions and climate change on other air pollutants, such as PM, is less certain, but research is underway to address these uncertainties.

The policies and the capital investments defined by transportation strategies in the proposed plan are consistent with the relevant control measures in the 2017 Clean Air Plan. **Table 3.4-9**, like **Table 3.4-8**, above, cross references the proposed plan's transportation and environmental strategies that align with and help implement control measures in the 2017 Clean Air Plan. See also Impact TRA-2 in Section 3.15, "Transportation," for a discussion of the proposed plan strategies. As noted under TRA-2, the combination of proposed plan transportation and environmental strategies, plus the housing and economy strategies in the proposed plan, would shift trips throughout the Bay Area away from driving and toward transit, walk, and bike modes. The proposed plan would support implementation of the 2017 Clean Air Plan. Therefore, the proposed plan would not conflict with nor obstruct implementation of the primary goals, applicable control measures, or implementation of any control measures of the Bay Area Air District's 2017 Clean Air Plan, and this impact would be less than significant (LTS).

Table 3.4-9: Proposed Plan Transportation Strategies and 2017 Plan Clean Air Control Measures

Proposed Plan Strategy	Relevant Control Measures in 2017 Clean Air Plan
Strategy T1: Operate and Maintain the Existing System. Commit to operate and maintain the Bay Area's roads and transit infrastructure while transitioning to zero-emission transit vehicles.	TR3, TR4, TR5, TR6
Strategy T2: Improve the Rider Experience through Transit Network Integration. Deliver regionwide efforts to improve the rider experience, including an integrated fare structure, unified mapping and wayfinding, and improved paratransit services.	TR3, TR4, TR5, TR8,
Strategy T3: Improve the Rider Experience through Refined Transfer Timing at Key Regional Hubs. Deliver regionwide efforts to improve the coordination of inter-agency schedules, refine transfer timing at key regional hubs, and upgrade facilities to encourage easier transfers.	TR5
Strategy T4: Enhance Security Measures and Improve Safety and Cleanliness on Transit. Improve infrastructure and operations around safety, personal security, and cleanliness in the transit environment.	TR3, TR4
Strategy T5: Implement Pricing Strategies to Manage Demand. Implement a series of usage-based pricing strategies to ease traffic, reduce vehicle mileage, and support climate goals; reinvest fees and charges toward corridor and transit improvements.	TR11, TR13

Proposed Plan Strategy	Relevant Control Measures in 2017 Clean Air Plan
Strategy T6: I Modernize Freeways. Implement projects designed to improve the quality of existing freeway assets by rebuilding interchanges and implementing advanced technologies.	TR6
Strategy T7: Expand Freeways and Mitigate Impacts. Implement a targeted set of freeway widenings to reduce bottlenecks, while supporting complementary actions to mitigate VMT impacts.	TR6
Strategy T8: Advance Other Regional Programs and Local Priorities. Fund regional programs like motorist aid and 511 while supporting local transportation investments on arterials, on local streets, and in Equity Priority Communities.	TR2, TR6, TR9

Notes: VMT = vehicle miles traveled.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NSCAPCD governs the North Coast Air Basin. NSCAPCD is in attainment for all State and federal criteria air pollutants, and NSCAPCD does not currently have and is not required to have an air quality management plan. NSCAPCD makes air quality improvements though the permitting and rule-making processes.

YSAQMD governs the Sacramento Valley Air Basin, which covers eastern Solano County. YSAQMD is within the Sacramento Air Quality Management District's federal nonattainment boundaries and is directly responsible for portions of the federal 2015 ozone SIP. YSAQMD was required to submit a reasonably available control technology (RACT) SIP analysis, and it was approved by their board of directors on September 9, 2020. The YSAQMD's RACT analysis recommends VOC limits for solvents that are generally equivalent to those found in the Bay Area Air District rule regulating solvent use. In addition, for State of California air quality standards, YSAQMD is not required to prepare an attainment plan for PM_{10} or $PM_{2.5}$, but YSAQMD consulted with MTC, ABAG, and the Bay Area Air District during the development of their triennial assessment and plan update, and the proposed plan would not be inconsistent with the YSAQMD Triennial Plan. See Section 3.4.2, "Regulatory Setting," for further information regarding air quality plans applicable to the proposed plan.

Conclusion

The proposed plan's core objectives and strategies align with and would support the implementation of the 2017 Clean Air Plan and YSAQMD Triennial Plan. Because the proposed plan would not conflict with or obstruct implementation of the primary goals, applicable control measures, or implementation of any control measures of the Bay Area Air District's 2017 Clean Air Plan and YSAQMD Triennial Plan, the impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact AQ-2: Result in a substantial net increase in construction-related emissions (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction

Due to the regional scale of the proposed plan and the programmatic level of this analysis, specific construction-related details (e.g., location, schedule, equipment) for individual land use development projects are not available. Therefore, construction-related emissions of air pollutants serve only as an approximation of the emissions that could result from the forecasted development pattern identified in the proposed plan. A qualitative analysis is provided below because construction of the proposed plan

would generate temporary criteria pollutant emissions primarily due to the operation of construction equipment and truck trips.

Construction-related emissions from implementation of the proposed plan's forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects would contribute to construction-related emissions but would not likely result in a substantial net increase in emissions under the proposed plan. Construction activity tends to be temporary in nature and would be expected to occur throughout the proposed plan's implementation period through 2050. Construction equipment and processes are generally similar between land use, sea level rise adaptation, and transportation projects.

As individual projects under the land use growth footprint, sea level rise adaptation projects, and planned transportation projects are constructed, construction activity would result in emissions of criteria air pollutants (e.g., $PM_{2.5}$ and PM_{10}) and precursors (e.g., ROG and NO_X) from site preparation (e.g., excavation, grading, and clearing); exhaust from off-road equipment, material delivery vehicles, and worker commute vehicles; vehicle travel on paved and unpaved roads; and other miscellaneous activities (e.g., building construction, asphalt paving, application of architectural coatings, and trenching for utility installation). The above pollutants are specifically relevant because the region is in nonattainment for State and federal ozone standards, the federal 24-hour $PM_{2.5}$ standard, and State PM_{10} standards. These emission types and associated levels fluctuate greatly depending on the particular type, number, and duration of usage for the varying equipment used during construction. The site preparation phase typically generates the most substantial emission levels because of the on-site equipment and ground-disturbing activities associated with grading, compacting, and excavation. Site preparation equipment and activities typically include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). With respect to construction equipment, EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel powered on-road vehicles and off-road equipment. The current EPA and CARB rules and emission standards are in the process of being implemented and are therefore reasonably foreseeable. EPA and CARB regulations of on-road and off-road engines target the primary sources of emissions at construction sites. These include on-road heavy-duty trucks and off-road aerial lifts, backhoes, cranes, crawler tractors, excavators, forklifts, graders, loaders, mowers, rollers, scrapers, skid steer loaders, tractors, trenchers, two-engine vehicles, and workover rigs. In addition, CARB's clean fuel standards would reduce emissions from all internal combustion engines, and their stationary and portable equipment regulations would reduce emissions from the smaller equipment used at construction sites, such as portable generators and tub grinders.

As stated above, due to the regional scale of the proposed plan and the programmatic level of this analysis, specific construction-related details (e.g., location, schedule, equipment) for individual land use development projects are not available. Therefore, the precise quantity of emissions would need to be determined at the time of the construction of a given project. Further, although an individual project may not generate significant short-term emissions, several projects could be under construction simultaneously, generating combined construction emissions that impact air quality. Although EPA and CARB have adopted stringent diesel PM emission regulations for construction equipment, these regulations alone cannot assure that all projects consistent with the proposed plan would use only the lowest emissions-generating construction equipment. This is due primarily to the fleet averaging component of the compliance requirements, which allows for some fleets to retain and continue to operate higher-polluting equipment so long as the fleet average emissions are below the target index for that fleet. Additionally, dust emissions from construction activity would occur from the disturbance of sites and material handling. Construction could also occur at any point under the plan build-out period and could potentially occur over a short period of time, resulting in substantial construction-related emissions on a daily basis.

Although construction impacts are considered temporary and localized in nature because they are limited to the time during which an individual project is being constructed and confined to areas adjacent to the construction site, there remains the potential for individual projects related to the projected land use growth footprint, sea level rise adaptation projects, and planned transportation projects to result in construction-related impacts that increase air pollutant concentration levels such that pollutant concentrations would exceed local air districts' thresholds.

This impact would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects could result in a substantial net increase in construction-related emissions, this impact would be **potentially significant (PS)**. Mitigation Measure AQ-2 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure AQ-2 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable to reduce impacts to a less-than-significant level based on project- and site-specific considerations, that include those identified below:

When applicable screening levels set by the relevant air district are exceeded, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable to reduce impacts to a less-than-significant level based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

Construction Best Practices for Exhaust

- The applicant or general contractor for the project shall submit a list of all off-road equipment greater than 25 horsepower (hp) that would be operated for more than 20 hours over the entire duration of project construction, including equipment from subcontractors, to the relevant air district (e.g., the Bay Area Air District, NSCAPCD, or YSAQMD) for review and certification. The list shall include all information necessary to ensure the equipment meets the following requirements:
  - Equipment shall be zero emission or have engines that meet or exceed either EPA or CARB Tier 4 off-road emission standards, and it shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4 Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required.
  - Idling time of diesel-powered construction equipment and trucks shall be limited to no more than 2 minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points.
  - All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications.
  - Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites, or propane and natural gas generators may be used when grid power electricity is not feasible.
  - Current certificate(s) of compliance with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation (CCR, Title 13, Sections 2449 and 2449.1) shall be provided.

Construction Best Practices for Entrained Dust

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. For projects over 5 acres in size, soil moisture should be maintained at a minimum of 12%. Moisture content can be verified by lab samples or a moisture probe.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads.
- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour (mph).
- All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be paved as soon as possible after grading.
- All construction sites shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints. The recommended response time for corrective action shall be within 48 hours. The Bay Area Air District's Complaint Line (1.800.334.6367) shall also be included on posted signs to ensure compliance with applicable regulations.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, shall be washed off before leaving the site.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1%.
- Hydroseed or apply nontoxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.
- Minimize the amount of excavated material or waste materials stored at the site.

Applicable mitigation measures shall be required at the time grading permits are issued.

Significance after Mitigation

The measures described above would minimize emissions of criteria air pollutants (e.g., PM_{10} and $PM_{2.5}$) and precursors (e.g., ROG and NOx) by requiring best practices for dust and exhaust emissions through the use of readily available, lower-emitting diesel equipment, and/or equipment powered by alternative cleaner fuels (e.g., propane) or electricity, as well as on-road trucks using particulate exhaust filters.

To the extent that an implementing agency requires an individual project to implement all feasible mitigation measures described above, a project's impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard (PS)

This discussion addresses operation-related impacts associated with implementation of the proposed plan. See Impact AQ-2 for a discussion of the construction-related impact of plan implementation.

Land Use Impacts

The proposed plan area is in nonattainment for State and federal ozone standards, the State $PM_{2.5}$ standard, and State PM_{10} standard. Emissions of ozone precursors (ROG and summertime NO_X), $PM_{2.5}$ and PM_{10} are evaluated to determine whether emissions of these pollutants would result in a cumulatively considerable net increase.

Implementation of the proposed plan would result in long-term operational (regional) emissions of ROG, NO_X, SO_X, CO, $PM_{2.5}$, and PM_{10} associated with mobile sources, area sources (e.g., natural gas emissions, landscaping, applications of architectural coatings, and use of consumer products), and emissions from the generation and consumption of electricity and natural gas.

Long-term operational emissions are a function of a variety of parameters, including project type, size, density/intensity, location, and design (including energy efficiency features). The proposed plan outlines projected land use patterns that serve as a guide—not a definitive prescription—for future development in the region. The development standards within these patterns are set by individual jurisdictions and local reviewing bodies. Whether or not individual projects would result in substantial operational emissions would depend on the previously listed parameters, most of which are not known at this time and therefore cannot be quantified on an individual basis.

Area Sources

As the proposed plan is implemented, project-level analysis of area sources would be required as appropriate by the CEQA lead agency. For example, the Bay Area Air District CEQA Guidelines state that individual projects that fall below the project-level screening criteria (see **Table 3.4-5**, above) and are consistent with the methodology used to develop the screening criteria may be considered to have less-than-significant impacts. Otherwise, lead agencies are suggested to evaluate potential air quality impacts of projects (and plans), as explained in Chapters 4 through 8 of the Bay Area Air District CEQA Guidelines, which describe how to analyze air quality impacts from criteria air pollutants, GHGs, local community risk and hazards, and odors associated with construction activity and operations of a project or plan. If after proper analysis, the project's or plan's air quality impacts are found to be below the significance thresholds, then the air quality impacts may be considered less than significant. If not, the lead agency would implement appropriate mitigation measures to reduce associated air quality impacts for discretionary project subject to CEQA. Lead agencies are responsible for evaluating and implementing all feasible mitigation measures in their CEQA document (BAAQMD 2023a).

Statewide, criteria pollutant emissions from area sources are forecast to increase through 2050 (CARB 2025c). Statewide emissions of ROG are forecast to increase by approximately 17.6% from 2027 to 2050, whereas statewide emissions of PM are forecast to increase by approximately 6.7% from 2027 to 2050

(CARB 2025c). The greatest source of statewide area-source ROG emissions is consumer products. CARB and the three air districts in the region have policies in place that regulate emissions from architectural coatings and hearths. CARB also has four existing consumer product regulations (CARB 2022). These are Article 1: Regulation for Reducing VOC Emissions from Antiperspirants and Deodorants, Article 2: the General the Consumer Products Regulation, Article 3: Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions, and Article 4: Alternative Control Plan Regulation for Consumer Products and Aerosol Coatings Products (CARB 2022). The greatest source of statewide area-source PM emissions is fugitive windblown dust, followed by dust from on-road vehicle travel (CARB 2025c). Therefore, it would be anticipated that regional emissions of ROG and PM from area sources would also increase, despite implementation of the plan. This is because as regional population and employment grow (see **Table 3.4-6 and Table 3.4-7**), so too would architectural coating applications, paving and roofing, and landscaping activities associated with growth in the built environment to accommodate housing and employment. Additionally, an increase in regional population and employment would result in a greater amount of consumer product use, as well as increases in dust PM emissions from a greater number of vehicles traveling on paved and unpaved roads. Notably, areawide sources, such as natural gas appliances, in buildings are forecast to decrease (CARB 2025c). This would occur as the State continues to shift toward all-electric buildings to achieve its goal of decarbonizing the building sector.

Despite increases in overall statewide and regional area-source emissions, implementation of the proposed plan would result in a more efficient distribution of emissions per capita due to the denser land use growth footprint proposed as part of the plan. Increasing housing density would result in fewer criteria pollutant emissions per capita, or the criteria pollutant emissions associated either directly or indirectly with a single person. Emissions of criteria pollutants are considered more efficient when a given area houses a larger number of people in a smaller area, which is typically achieved by increasing multifamily housing development. The proposed plan designates specific geographic areas—known as Growth Geographies—in order to guide where future household and job growth would be focused under the proposed plan's strategies over the next 25 years. As described in Chapter 2, "Project Description," the Growth Geographies under the proposed plan are a mix of (a) areas designated by local jurisdictions—Priority Development Areas (PDAs) and Priority Production Areas (PPAs), and (b) areas defined by criteria related to transit service and access to opportunity—Transit-Rich Areas (TRAs) and High-Resource Areas (HRAs). These areas are likely to accommodate the majority of new homes and jobs under the proposed plan. By focusing growth, and therefore increasing development density, in these areas, emissions from land uses would be more efficient.

Because of the programmatic nature of the proposed plan, individual projects and associated emissions may be different than what is projected at the plan level and may exceed applicable emissions thresholds set by the Bay Area Air District, NSCAPCD, or YSAQMD, as such thresholds were developed to be applied to project-level emissions. Operational area-source emissions from discretionary development would be evaluated prior to project-level approval to ensure proper CEQA clearance and implementation of applicable reduction controls or mitigation measures.

Stationary Sources

With respect to stationary source emissions, levels can vary greatly depending on the exact operations and processes involved. Stationary sources of pollutants would be required to obtain permits from the local air district to operate in compliance with local air district rules. These sources could include diesel engine or gas turbine generators for emergency power generation; central heating boilers for commercial, industrial, or large residential buildings; process equipment for light industrial uses; kitchen equipment at restaurants and schools; service station equipment; and dry-cleaning equipment. The permit process would ensure that these sources would be equipped with required emission controls. Because of the programmatic nature of the proposed plan, individual projects and potential associated stationary-source emissions may be different than what is projected at the plan level and may exceed applicable emissions

thresholds set by the Bay Area Air District, NSCAPCD, or YSAQMD, as such thresholds were developed to be applied to project-level emissions. Operational stationary-source emissions from projected growth would be evaluated prior to project-level approval to ensure proper CEQA clearance and implementation of applicable reduction controls and/or mitigation measures.

This impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

The operation of sea level rise adaptation projects would not result in a considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard because the sea level rise adaptation projects would not include stationary equipment that would generate or emit emissions. This impact would be less than significant (LTS).

Transportation System Impacts

As stated in Section 3.4.2, "Regulatory Setting," Public Law No. 119-6, enacting Joint House Resolution 88, was passed June 12, 2025 to disapprove the EPA's December 2024 waiver under the CAA that allowed California to implement and enforce the ACC II regulation. The implications of this law on the State's capability to enforce its independent fuel economy standards are uncertain at this time, as the California Attorney General filed a lawsuit challenging P.L. No. 119-16 on June 12, 2025. CARB has not provided guidance, to date, on how to address these uncertainties in using its EMFAC modeling. Therefore, the analysis below represents a comprehensive range of emissions estimates that could result from the proposed plan.

As detailed in "Methodology," above, emissions from the proposed plan were calculated using both EMFAC2017, which does not include ACC II emissions reductions and includes emissions reduction estimates based on older, less stringent mobile-source emissions regulations and EMFAC2021, which also does not include ACC II emissions reductions, but includes a cleaner fleet based on more recent mobile source emissions regulations that are still in effect. The emissions results under these models represents a range of emissions that may occur. **Table 3.4-10** shows emissions estimates calculated using EMFAC2021 and **Table 3.4-11** shows emissions calculated using EMFAC2017. As shown in **Table 3.4-10**, mobile source emissions of criteria pollutants ROG, NO_X (summertime and wintertime) in the region would decrease between existing conditions, measured using 2023 data, and 2050 using EMFAC2021. As shown in **Table 3.4-11**, regional mobile source emissions estimates of ROG and NO_x would also decrease between the existing conditions baseline, relying on 2023 data, and 2050 with the use of EMFAC2017, though to a lesser degree than estimated using EMFAC2021 reduction estimates. This is because EMFAC2021 applies emissions reductions based on more recent stricter mobile source emissions regulations as compared to EMFAC2017. Therefore, the emissions estimates shown in **Table 3.4-10** and **Table 3.4-11** represent a comprehensive range of emissions estimates from the proposed plan to incorporate the uncertainty of the future regulatory landscape.

Table 3.4-10: Emission Estimates for Criteria Pollutants Using EMFAC2021 (tons per day)

	Baseline, 2023	Proposed Plan, 2050	Change, 2023 to 2050 Numerical	Change, 2023 to 2050 Percent
ROG	28.4	16.8	-11.6	-41%
NO_X (Summertime)	36.3	16.0	-20.3	-56%
NO_X (Wintertime)	42.3	19.1	-23.2	-55%
$PM_{2.5}$	3.8	4.7	0.9	23%
PM_{10}	18.7	24.7	6.0	32%

Notes: EMFAC = Emission Factor model; ROG = reactive organic gasses; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter; PM = particulate matter. Forecasts of mobile-source emissions do not account for expected reductions from the implementation of strategy EN8 or EN9 because of modeling limitations. Forecasts of ROG and NO_X emissions include emissions reductions from five Transportation Control Measures (TCM) incorporated in the 2001 Ozone Attainment Plan; (0.5) tons/day of ROG and (0.7) tons/day of NO_X.

Source: Emissions modeling using EMFAC2021; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

As shown in **Table 3.4-10**, when compared to existing conditions (2023), emissions associated with development under the proposed plan modeled using EMFAC2021 would be reduced: ROG emissions by 41% (11.6 tons per day), summertime NO_X emissions by 56% (20.3 tons per day), and wintertime NO_X emissions by 55% (23.2 tons per day). The primary reason for these reductions is the increasingly stringent vehicle emissions regulations and statewide EV sales requirements (e.g., Advanced Clean Trucks, portions of Advanced Clean Fleets, and Multi-Pollutant Emissions Standards for Light- and Medium-Duty Vehicles) that are assumed as part of the EMFAC2021 model. The higher levels of PM_{10} emissions in 2050 conditions are primarily a function of the 22% growth in VMT (**Table 3.4-6 and Table 3.4-7**) (which directly affects the occurrence of entrained roadway dust), with some contributions from tire and brake wear and exhaust. Exhaust emissions of PM_{10} would not increase at the same rate as VMT (22%) because of the more stringent emission controls that would take effect with fleet turnover. Note that daily VMT is projected to increase when comparing the proposed plan to existing conditions, but to a large degree, these increases would be offset by improvements to the efficiency of the vehicle fleet.

Table 3.4-11: Emission Estimates for Criteria Pollutants Using EMFAC2017 (tons per day)

	Baseline, 2023	Proposed Plan, 2050	Change, 2023 to 2050 Numerical	Change, 2023 to 2050 Percent
ROG	24.7	15.7	-9.0	-36%
NO_X (Summertime)	36.9	34.5	-2.5	-7%
NO_X (Wintertime)	41.2	37.8	-3.5	-8%
$PM_{2.5}$	5.8	7.1	1.3	22%
PM_{10}	22.9	28.9	6.0	26%

Notes: EMFAC = Emission Factor model; ROG = reactive organic gasses; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter; PM = particulate matter. Forecasts of mobile-source emissions do not account for expected reductions from the implementation of strategy EN8 or EN9 because of modeling limitations. Forecasts of ROG and NO_X emissions include emissions reductions from five TCMs incorporated in the 2001 Ozone Attainment Plan; (0.5) tons/day of ROG and (0.7) tons/day of NO_X.

Source: Emissions modeling using EMFAC2017; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

As shown in **Table 3.4-11**, when compared to existing conditions (2023), emissions associated with development under the proposed plan modeled using EMFAC2017 would be reduced: ROG emissions by 36% (9 tons per day), summertime NO_X emissions by 7% (2.5 tons per day), and wintertime NO_X emissions by 8% (3.5 tons per day). As identified above, emissions reductions would primarily be the result of increasingly stringent vehicle emissions regulations and implementation of statewide EV sales requirements (e.g., Advanced Clean Trucks, portions of Advanced Clean Fleets, and Multi-Pollutant Emissions Standards for Light- and Medium-Duty Vehicles).

Mobile-source $PM_{2.5}$ emissions would increase by 22% (1.3 tons per day), and PM_{10} emissions would increase 26% (6.0 tons per day) during the proposed plan's timeframe compared to existing conditions when modeled using EMFAC2017. The higher levels of PM_{10} emissions in 2050 conditions are primarily a function of the 22% growth in VMT (**Table 3.4-6 and Table 3.4-7**) (which directly affects the occurrence of entrained roadway dust), with some contributions from tire and brake wear and exhaust. Exhaust emissions of PM_{10} would not increase at the same rate as VMT (22%) because of the stringent emission controls that would take effect with fleet turnover. Note that daily VMT is projected to increase when comparing the proposed plan to existing conditions, but to a large degree, these increases would be offset by improvements to the vehicle fleet.

It should be noted that, although this analysis for the proposed plan estimates an increase in mobile-source PM emissions, this does not mean the region is out of compliance with federal CAA requirements. Because the Bay Area is designated as nonattainment for multiple federal air quality standards, MTC is required to conduct a regional emissions analysis as part of transportation conformity to demonstrate that implementation of the proposed plan remains consistent with the State Implementation Plan (SIP) and the CAA. For additional information regarding federal transportation conformity, see Section 3.4.2, above.

As previously stated, litigation over the federal rescission of California's CAA waiver is ongoing at the time this Draft EIR is being drafted. For the purpose of this analysis, MTC and ABAG have determined that the most accurate analysis feasible involves estimating a range of mobile source emissions using EMFAC2017 and EMFAC2021 to account for uncertainties in the current and future regulatory landscape. Therefore, it is expected that potential future emissions under the proposed plan would be within this estimated range. As discussed under "Method of Analysis," above, because EMFAC2021 applies emissions reductions based on more recent mobile source emissions regulations, emissions estimates identified in the analyses below which were calculated using EMFAC2021 data are considered a less conservative estimate of emissions, while calculations made using EMFAC2017 provide a more conservative estimate of emissions because it includes reduction estimates based on older, less stringent mobile-source emissions regulations. Even with the use of more conservative modeling, emissions of ROG and NO_x will be reduced in the future.

Nonetheless, because there would be a net increase in PM_{10} and $PM_{2.5}$ emissions from mobile sources in both emissions scenarios, this impact would be potentially significant (PS).

Conclusion

At the plan level of analysis, the specific timing, size, and land use that may characterize a project under the plan that exceeds an applicable mass emission threshold is unknown. Therefore, it is conservatively assumed that some land uses would exceed an applied project-level threshold of significance related to exposure to emissions and could cause adverse health outcomes. As stated in "Method of Analysis," to provide a conservative estimate of emissions and associated impacts, this analysis bases its impact determinations on the most conservative emissions estimates calculated using EMFAC2017 and EMFAC2021. The range of emissions calculated using EMFAC2017 and EMFAC2021 is intended to provide a bottom–and top-end estimate between which the emissions calculated using the adjusted EMFAC2021 model would fall. Therefore, it is conservatively assumed that, as shown in **Table 3.4-11**, when compared to existing conditions (2023), ROG emissions associated with development under the proposed plan would be reduced by 36% (9 tons per day), summertime NO_X emissions by 7% (2.5 tons per day), and wintertime NO_X emissions by 8% (3.5 tons per day). The most conservative estimate of mobile-source PM emissions were produced by the emissions modeling conducted using EMFAC2021. Therefore, as shown in **Table 3.4-12**, it is conservatively assumed that mobile-source $PM_{2.5}$ emissions would increase by 23% (0.9 tons per day), and PM_{10} emissions would increase 32% (6.0 tons per day) during the proposed plan's timeframe compared to existing conditions.

Regarding mobile-source emissions, under both the EMFAC2017 and EMFAC2021 emissions estimations, $PM_{2.5}$ and PM_{10} emissions would increase under the proposed plan compared to existing conditions. A key source of PM is the combustion of fossil fuels. After these fuels break down during combustion, they cool, become radicalized, and agglomerate. These particles can form highly toxic compounds, and, when inhaled, the particles can enter the respiratory tract, causing chemical imbalances throughout the body, potentially resulting in inflammation, cell death, and organ failure. The health effects from toxic PM emission compounds can contribute to cardiovascular events, such as stroke and heart attack (EPA 2024).

For PM emissions, the Bay Area faces challenges in overcoming information gaps including concerns of newly dominant sources of $PM_{2.5}$. As PM emissions from top sources are reduced, additional sources emerge as priorities, yet less information is available about these other sources. This leaves a lag between re-prioritization and updated scientific literature and this uncertainty cannot yet be quantified.

The increase of PM emissions could result in an increase in ambient concentrations of PM in the San Francisco Bay Area Air Basin and, moreover, increase the likelihood that ambient concentrations exceed the CAAQS and NAAQS. The increase in plan-generated emissions of PM could impede air quality planning efforts to bring the air basin into attainment of the CAAQS for both PM_{10} and $PM_{2.5}$. However, the levels of

criteria air pollutant and precursor emissions associated with implementation of the plan cannot be directly correlated to specific health outcomes for specific sensitive receptors.

While the description of effects noted above could manifest in the recipient receptors, actual effects on individuals depend on individual factors, such as life stage (e.g., older adults are more sensitive), preexisting cardiovascular or respiratory diseases, and genetic conditions. Even with this type of specific medical information (which is confidential to the individual), there are wide ranges of potential outcomes from exposure to particulates, from no effect to the effects described above. In addition, local and regional concentration levels of PM are highly dependent on meteorological conditions, such as precipitation and wind patterns, and MTC does not have land use authority over the anticipated new development under the plan and cannot know with certainty that future development would occur as outlined in the proposed plan or if new growth would occur in the plan area and period. Therefore, other than determining the types of health effects that could occur, it would be speculative to more specifically correlate exposure to criteria air pollutants from this plan to specific health outcomes for sensitive receptors.

Plan-generated emissions could contribute to the existing nonattainment condition in the region with respect to the CAAQS and NAAQS for PM and could therefore increase the potential for adverse health impacts from exposure to PM. Although the plan would not conflict with the 2017 Clean Air Plan and other applicable plans and policies, it is possible that individual projects developed under the plan could exceed the Bay Area Air District's, NSCAPCD's, and YSAQMD's project-level thresholds. For this reason, should this occur, this impact would be **potentially significant (PS)**. Mitigation Measures AQ-3(a) through AQ-3(e) address this impact and are presented below.

Mitigation Measures

Mitigation Measure AQ-3(a) MTC and ABAG, in partnership with the local air districts and implementing agencies, shall work together to support the use of existing air quality and transportation funds and seek additional funds to continue to implement the Bay Area Air District, NSCAPCD, YSAQMD, and CARB programs (e.g., Carl Moyer Program) intended to retrofit and replace trucks and locomotives.

Mitigation Measure AQ-3(b) MTC and ABAG, in partnership with the local air districts and the Port of Oakland, and other agency partners, shall work together to secure incentive funding to reduce mobile PM emissions from mobile exhaust and entrained PM sources, such as tire wear, brake wear, and roadway dust.

Mitigation Measure AQ-3(c) MTC and ABAG, in partnership with local air districts, and implementing agencies shall:

- support the advancement of corridor-level plans and implementation of projects located on severely congested (LOS F) facilities, and
- incorporate transportation demand management (TDM) strategies into individual land use land transportation projects and plans, as part of the planning process; TDM strategies could include ridesharing, carsharing, telecommuting, adopting flexible working hours, implementing parking management and traffic-calming measures, and marketing TDM options (especially alternative commuting services).

Mitigation Measure AQ-3(d) When applicable screening levels set by the applicable air district are exceeded for a specific project, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below or are updated by the applicable air district or within CalEEMod:

- use of energy-efficient lighting and process systems (e.g., low-NO_X water heaters and boiler units);
- design streets to maximize pedestrian access to transit stops;

- include bus shelters at transit access points where deemed appropriate by local public transit operator in large residential, commercial, and industrial projects;
- equip residential structures with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment;
- provide for, or contribute to, dedication of land for off-site Class I and Class II bicycle facilities linking the project to designated bicycle commuting routes in accordance with the regional bikeway master plan;
- contribute to the provision of synchronized traffic signals on roadways affected by the project and as deemed necessary by the local public works department;
- provide transit-enhancing infrastructure that includes bus turnouts or bulbs, passenger benches, street lighting, route signs and displays, and shelters as demand and service routes warrant, subject to review and approval by local transportation planning agencies;
- provide pedestrian-enhancing infrastructure that includes sidewalks and pedestrian paths, direct pedestrian connections, street trees to shade sidewalks, pedestrian safety designs and infrastructure, street furniture and artwork, street lighting, pedestrian signalization and signage, and/or access between bus service and major transportation points within the project;
- include neighborhood park(s) or other recreational options, such as trails, within the development to minimize vehicle travel to off-site recreational and/or commercial uses;
- install solar water heaters;
- incorporate mixed uses, where permitted by local development regulations, to achieve a balance of commercial, employment, and housing options on the project site;
- contribute to traffic-flow improvements (e.g., right-of-way, capital improvements) that reduce traffic congestion and do not substantially increase roadway capacity;
- provide preferential parking spaces for carpool and vanpool vehicles, implement parking fees for single-occupancy vehicle commuters, and implement parking cash-out program for employees;
- use clean fuel vehicles in the vehicle fleet;
- require all employment centers to include an adequate number of on-site shower/locker facilities for bicycling and pedestrian commuters (typically one shower and three lockers for every 25 employees per shift);
- construct/contribute to bicycle and pedestrian facility improvements;
- provide ancillary services (e.g., cafeterias, health clubs, automatic tellers, and post offices) within walking distance of proposed development (no further than 1,500 feet) as appropriate and in compliance with local development regulations;
- provide park-and-ride lots as deemed feasible and appropriate by transportation planning agencies;
- employment centers that exceed a designated size, as measured by the number of employees, shall provide on-site child care and after-school facilities or contribute to off-site construction of such facilities within walking distance of employment land uses (for employment centers on or adjacent to industrial land uses, on-site child daycare centers shall be provided only if supported by the findings of a comprehensive HRA performed in consultation with the local air district);
- provide on-site pedestrian facility enhancements, such as walkways, benches, proper lighting, vending machines, and building access that are physically separated from parking lot traffic;

- offer alternative work schedules, where practical, that allow for work hours that are compressed into fewer than 5 days (e.g., 9/80, 4/40, or 3/36 schedules), or allow flextime schedules;
- provide transit amenities (e.g., on-site and off-site bus turnouts, passenger benches, or shelters) where deemed appropriate by local transportation planning agencies;
- contribute to the provision of synchronized traffic signals on roadways affected by the proposed project and as deemed necessary by the local public works department;
- provide video conferencing facilities;
- commit to support programs that include guaranteed ride home, subsidized transit passes, and rideshare matching;
- provide transportation (e.g., shuttles) to major transit stations and multimodal centers;
- require each employer employment center (more than 25 employees) to assign a transportation coordinator for the applicable transportation management association (TMA);
- require all employers to install a permanent display in employee common areas of alternate transit information, as determined by the requirements of the TMA;
- require employers or employment centers (more than 25 employees) to implement a guaranteed ride home program;
- require employers or employment centers (more than 25 employees) to implement an incentive program for riding transit, carpooling, vanpooling, biking, and walking instead of driving a single-occupancy vehicle to work, and design and locate buildings to facilitate transit access;
- install Energy Star (or equivalent) cool roofing systems on all buildings;
- design shuttle and transit exits to adjoining streets to reduce time to reenter traffic from the project site;
- increase wall and attic insulation to 20% above Title 24 requirements (residential and commercial);
- orient buildings to take advantage of solar heating and natural cooling, and use passive solar designs (residential, commercial, and industrial);
- provide energy-efficient windows (double pane and/or Low-E) and awnings or other shading mechanisms for windows, porches, patios, and walkways;
- include passive solar cooling and heating features in designs, as well as ceiling and whole house fans;
- include programmable thermostats in the design of heating and cooling systems; and
- use day lighting systems, such as skylights, light shelves, and interior transom windows.

See also Chapter 3, "Measures to Reduce GHG Emissions," in CAPCOA's *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (CAPCOA Handbook) for additional reduction measures (CAPCOA 2024). Although the CAPCOA Handbook focuses on GHG reduction measures, co-benefits of many measures include criteria pollutant emission reductions. Future project proponents shall use the CAPCOA Handbook to develop measures to reduce emissions to below thresholds if significant impacts are identified.

Mitigation Measure AQ-3(e): Implementing agencies and/or project sponsors shall implement the following measures, where feasible and as applicable to reduce impacts to a less-than-significant level based on project- and site-specific considerations, to reduce criteria air pollutant emitted by natural gas combustion in buildings:

- Prohibit natural gas infrastructure in new development.

- Use, or design to support, microgrid electric systems to facilitate the resiliency of new developments prohibiting natural gas.
- Equip residential structures containing front and rear yard area with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment.
- Install ground-source heat pumps, solar, or other alternatively-fueled water heaters instead of natural gas or grid-based electric water heaters.
- Install ground-source heat pump, or other alternative, heating and cooling systems.
- Increase wall and attic insulation to 20% above Title 24 requirements (residential and commercial).
- Orient buildings to take advantage of solar heating and natural cooling, and use passive solar designs (residential, commercial, and industrial).
- Provide energy-efficient windows (double pane and/or Low-E) and awnings or other shading mechanisms for windows, porches, patios, and walkways.
- Use passive solar cooling and heating designs, ceiling and whole house fans, and programmable thermostats in the design of heating and cooling systems.

Significance after Mitigation

Mitigation Measures AQ-3(a) through AQ-3(d) would reduce significant impacts from forecasted increases in $PM_{2.5}$ and PM_{10} because they would lead to reductions in vehicle trips and VMT. Further, Mitigation Measure AQ-3(e) would reduce area-source emissions from natural gas combustion and landscaping equipment in new developments. Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, because reductions cannot be estimated, it cannot be concluded with certainty that all significant impacts would be avoided. This impact would remain **significant and unavoidable (SU)** for purposes of this program level review.

Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations (PS)

Some communities and neighborhoods in the region experience relatively higher air pollution levels and corresponding negative health impacts than others. Levels of local air pollutants, such as fine PM and TACs, are highest near air pollution sources, such as freeways, heavily trafficked seaports, and large industrial facilities. In addition, there are many smaller, more discrete sources of air pollution, including gas stations and backup diesel generators, that exacerbate conditions in communities with already elevated levels of air pollution that can be harmful to people's health (BAAQMD 2023a). Given the lack of specific information regarding construction locations and construction activities, impacts cannot be quantified with precision.

The proposed plan could potentially expose sensitive receptors to substantial pollution; therefore, this impact would be significant if implementation of the proposed plan would:

- locate sensitive receptors in areas where:
  - (a) cancer risk would exceed 100 in a million, exceed fine PM concentrations of 0.8 micrograms per cubic meter ($\mu g/m^3$), and/or are within 500 feet of a freeway, 175 feet of a major roadway (>30k AADT), or 500 feet of a ferry terminal; or
  - (b) TACs (cancer risk) or $PM_{2.5}$ concentrations would result in noncompliance with an adopted Community Risk Reduction Plan;
- cause a cumulative net increase in emissions of TACs, including diesel PM, 1,3-butadiene, and benzene, from on-road mobile sources compared to existing conditions;
- result in an increase of TAC or $PM_{2.5}$ emissions in Overburdened Communities

Land Use Impacts

TAC risk areas tend to occur along high-volume freeways and roadways, high-use rail lines, locations near numerous stationary-sources, and locations where a single stationary-source has very high estimated cancer risk levels or $PM_{2.5}$ concentration (CARB 2005). Additionally, some communities and neighborhoods in the region experience relatively higher air pollution levels and corresponding negative health impacts than others.

Construction-related activities associated with the buildout of the proposed plan would result in temporary, intermittent emissions of diesel PM from the exhaust of off-road equipment used during demolition and building modernization and on-road heavy-duty trucks. On-road diesel-powered haul trucks traveling to and from a construction area to deliver materials and equipment are less of a concern because they do not operate at any one location for extended periods of time such that they would expose a single receptor to excessive diesel PM emissions.

Currently, however, the timing, duration, and magnitude of construction activities, as well as the potential for overlapping construction from multiple projects to occur is unknown. Additionally, because the proposed plan does not include specific development proposals, the exact timing, haul truck routes, duration of construction activity, and types of equipment are unknown at this time and consequently a project-specific HRA cannot be conducted. Nevertheless, future construction activities related to regional growth and land use change could generate TACs exceeding local thresholds for cancer risk (for example, the Bay Area Air District's threshold of 10 in one million for carcinogenic risk or a noncarcinogenic hazard index of 1.0 or greater).

The proposed plan promotes a compact growth pattern paired with an efficient transportation system to facilitate a reduction in VMT in the region. The forecasted development pattern of the proposed plan involves a mixture of development and redevelopment in the land use growth footprint that would accommodate projected population growth in the plan area through 2050.

Though exact future locations cannot be known at this time, land use development under the proposed plan could result in new sensitive receptors close (within the distance buffers identified by CARB) to TAC sources, potentially resulting in exposure to substantial TAC concentrations. The siting of new sensitive receptors would be subject to an individual jurisdiction's land use approval processes. The compact land use pattern under the proposed plan is intended to affect travel behavior and provides a means to determine the impact of future vehicle emissions in the plan area. A compact growth pattern served by an efficient and diverse transportation system provides the foundation to reduce automobile travel and increase walking, bicycling, and transit use—all of which reduce individual automobile trips and associated VMT. Reduced VMT and automobile trips are directly linked to reduced regional criteria air pollutant emissions and TAC emissions from mobile sources. However, compact development can also result in the proximity of new sensitive receptors to localized sources of TACs.

Regional growth could also result in new stationary TAC sources to be sited in proximity to existing sensitive receptors. The proposed plan does not directly propose the siting of any stationary TAC sources (i.e., new distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, large gasoline dispensing facilities, or other land uses that may accommodate major sources of TACs). However, the local jurisdictions' land use plans that form the basis of the forecasted development pattern of the proposed plan could include the siting of permitted and non-permitted TAC sources near sensitive receptors in commercial and industrial areas throughout the plan area.

As is the case with existing industrial facilities, stationary sources, in addition to any other stationary sources that may emit TACs (except for non-permitted sources), would be subject to air district rules and regulations, including general requirements, new source review, toxics best available control technology (T-BACT) requirements, Title V federal operating permit requirements, and National Emission Standards for Hazardous Air Pollutants Compliance Monitoring (NESHAPs). Therefore, the applicable air district would

analyze such sources based on their potential to emit TACs. If it were determined that the sources would emit TACs in excess of an air district's applicable threshold of significance, T-BACT would be implemented to reduce emissions. If the implementation of T-BACT would not reduce the risk below the applicable threshold, an air district would deny the required permit (or deny the renewal of existing permits). Even if multiple permitted TAC sources located in proximity to each other generated a combined incremental increase in health risk in excess of the applicable air district standards (e.g., 100 in one million for excess cancer risk), these standards are incremental increase thresholds (e.g., increase over background) that inherently account for the possibility of sensitive receptors being exposed to risk from multiple TAC sources in addition to background risk levels. In other words, as incremental increase thresholds, they address the cumulative contribution of each individual stationary source of TACs. As a result, given compliance with applicable rules and regulations, operation of any stationary sources would not be expected to result in the exposure of sensitive receptors to TACs at levels exceeding an air district's significance threshold.

Although new permitted sources can mitigate TACs through local air district processes (e.g., permit requirements), as noted above, some stationary TAC sources do not require permitting by the applicable air district, and some permitted facilities may include non-permitted sources (e.g., heavy-duty truck travel) that are not controlled by compliance with existing processes.

Although some of the proposed plan's land use growth footprint could result in additional stationary sources and building energy and water usage, these would be subject to applicable air district rules as established by adopted plans and regulations at the time of air quality permitting, as well as project-level CEQA analyses, as applicable.

Additionally, in jurisdictions with an adopted community risk reduction plan (CRRP), any proposed project that includes sensitive land uses or receptors should be evaluated against the standards and mitigation measures in those adopted plans. The goal of a CRRP is to bring TAC and $PM_{2.5}$ concentrations for the entire community covered by the plan down to acceptable levels as identified by the local jurisdiction and approved by the applicable local air district. This approach provides local agencies a proactive alternative to addressing communities with high levels of risk on a project-by-project approach.

The proposed plan could locate sensitive receptors in areas where TACs or $PM_{2.5}$ concentrations result in cancer risk levels greater than 100 in a million or a concentration of $PM_{2.5}$ greater than 0.8 micrograms (µg) per cubic meter (m^3), or where TACs or $PM_{2.5}$ concentrations are in noncompliance with an adopted CRRP. Therefore, land use impacts would be potentially significant (PS). Mitigation Measure AQ-4(a) is presented below to help reduce TACs or $PM_{2.5}$ emissions from mobile and area sources.

Sea Level Rise Adaptation Impacts

The operation of sea level rise adaptation projects would not result in a considerable net increase in emission of fine PM or TACs because it would not include stationary equipment that would generate or emit emissions. Therefore, implementation of sea level rise adaptation projects would not result in the exposure of sensitive receptors to substantial pollutant concentrations. This impact would be less than significant (LTS).

Transportation System Impacts

For transportation system impacts, the proposed plan would have a significant impact if it would:

- cause a cumulative net increase in emissions of TACs, including diesel PM, 1,3-butadiene, and benzene, from on-road mobile sources compared to existing conditions, or
- result in changes in TAC and or $PM_{2.5}$ exposure levels that disproportionally impact Overburdened Communities.

Toxic Air Contaminants Emissions

Mobile sources and projected changes in VMT are based on transportation and land use forecasts developed using the MTC travel demand forecasting model, known as Travel Model 1.6, with the land use forecasting model, known as Bay Area UrbanSim 2.6. The integrated model produced the key outputs used in assessing the significance of transportation and air quality impacts, such as VMT. Based on this modeling, it is estimated that implementation of the proposed plan would result in a net increase in VMT (**Table 3.4-6 and Table 3.4-7**); however, as shown in **Table 3.4-12**, there would be a 47% decrease in diesel PM, a 50% decrease in 1,3-butadiene, and a 54% decrease in benzene compared to existing conditions. **Table 3.4-13** shows that, using CT-EMFAC2017 emissions reduction estimates, there would be a 15% decrease in diesel PM, a 14% decrease in 1,3-butadiene, and a 14% decrease in benzene compared to existing conditions. These reductions can be attributed to CARB regulations that control TACs, namely AB 1807 of 1983 that created the Toxic Air Contaminant Identification and Control Act, AB 2588 of 1987 that established the Air Toxics "Hot Spots" Information and Assessment Act, and SB 656 of 2003 that requires CARB and local air districts to identify control measures for PM. Other State regulations that reduce smog or other pollutants also reduce TACs, such as the standards for low-emission vehicles, clean fuels, reformulated gasoline and diesel fuel specifications, and CARB's HDVIP, discussed above. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan and other regulatory programs, it is estimated that by 2035, emissions of diesel PM will be less than half of those in 2010 (CARB 2016). In addition, the State's regulations requiring increased EV truck integration will help to reduce TAC emissions from trucks by replacing fossil fuel–powered trucks with EV trucks. As described in Section 3.4.2, "Regulatory Setting," the Advanced Clean Trucks regulation requires that 40% of Class 8 truck purchases be zero emission by 2035, while the Advanced Clean Fleets regulation requires State and local government fleets to be fully electric by 2045.

Table 3.4-12: Emission Estimates for Toxic Air Contaminants Pollutants Using CT-EMFAC2021 (kilograms per day)

	Baseline, 2023	Proposed Plan, 2050	Change, 2023 to 2050 Numerical	Change, 2023 to 2050 Percent
Diesel Particulate Matter	159	84	-75	-47%
1,3 Butadiene	11	5	-5	-50%
Benzene	120	55	-65	-54%

Notes: CT-EMFAC= California Department of Transportation (Caltrans) Emission FACtors model. Forecasts of mobile-source emissions do not account for expected reductions from the implementation of strategy EN8 or EN9 because of modeling limitations.
Source: Emissions modeling using CT-EMFAC2021; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 3.4-13: Emission Estimates for Toxic Air Contaminants Pollutants Using CT-EMFAC2017 (kilograms per day)

	Baseline, 2023	Proposed Plan, 2050	Change, 2023 to 2050 Numerical	Change, 2023 to 2050 Percent
Diesel Particulate Matter	138	117	-21	-15%
1,3 Butadiene	23	20	-3	-14%
Benzene	103	88	-15	-14%

Notes: CT-EMFAC= California Department of Transportation (Caltrans) Emission FACtors model. Forecasts of mobile-source emissions do not account for expected reductions from the implementation of strategy EN8 or EN9 because of modeling limitations.
Source: Emissions modeling using CT-EMFAC2017; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Because the proposed plan would result in a reduction in TAC emissions under both estimated emissions scenarios, as shown in **Table 3.4-12** and **Table 3.2-13**, there would be a less-than-significant impact (LTS).

Effects on Overburdened Communities

This analysis discloses effects from TAC and $PM_{2.5}$ emissions on Overburdened Communities. **Figure 3.4-1** displays the locations of designated Overburdened Communities in relation to MTC and ABAG's designated Equity Priority Communities (previously known as "Communities of Concern").

Table 3.4-14 summarizes MTC's analysis results using EMFAC2021 emissions rates, expressed as a percentage change in TAC pollutants (diesel PM, benzene, and 1, 3 butadiene), $PM_{2.5}$ exhaust, and total $PM_{2.5}$ emissions when compared to the base year emissions for each county with an Overburdened Community and the entire region.

Table 3.4-14: Percent Change in On-Road Mobile Source Exhaust and Total $PM_{2.5}$ Emissions, Years 2023–2050 (EMFAC2021)

County	Overburdened Community Status	Exhaust Emissions				Non-Exhaust Emissions		Total $PM_{2.5}$	VMT
		$PM_{2.5}$	Diesel PM	Benzene	1,3 Butadiene	Break & Tire Wear	Entrained Road Dust		
Alameda	Overburdened Community	-38%	-29%	-51%	-46%	30%	45%	27%	24%
	Remainder of County	-46%	-37%	-57%	-53%	25%	39%	20%	19%
Contra Costa	Overburdened Community	-46%	-55%	-63%	-59%	15%	30%	11%	19%
	Remainder of County	-48%	-58%	-61%	-57%	14%	28%	10%	17%
Marin	Overburdened Community	-62%	-63%	-63%	-59%	5%	17%	-2%	8%
	Remainder of County	-64%	-65%	-65%	-61%	6%	22%	2%	9%
Napa	Overburdened Community	-53%	-56%	-59%	-56%	31%	35%	21%	40%
	Remainder of County	-68%	-71%	-71%	-69%	1%	11%	-6%	14%
San Francisco	Overburdened Community	-52%	-61%	-47%	-47%	22%	49%	27%	28%
	Remainder of County	-59%	-67%	-54%	-54%	6%	21%	4%	11%
San Mateo	Overburdened Community	-42%	-39%	-26%	-15%	34%	55%	36%	32%
	Remainder of County	-35%	-31%	-16%	-4%	23%	46%	50%	21%
Santa Clara	Overburdened Community	-47%	-42%	-53%	-47%	23%	35%	22%	21%
	Remainder of County	-39%	-35%	-43%	-35%	31%	48%	38%	29%

County	Overburdened Community Status	Exhaust Emissions				Non-Exhaust Emissions		Total $PM_{2.5}$	VMT
		$PM_{2.5}$	Diesel PM	Benzene	1,3 Butadiene	Break & Tire Wear	Entrained Road Dust		
Solano	Overburdened Community	-51%	-45%	-68%	-67%	19%	29%	10%	16%
	Remainder of County	-52%	-45%	-72%	-70%	18%	27%	6%	15%
Sonoma	Overburdened Community	-70%	-77%	-76%	-73%	-6%	10%	-13%	7%
	Remainder of County	-68%	-78%	-72%	-70%	1%	16%	-5%	15%
Total Bay Area	Overburdened Community	-46%	-45%	-55%	-51%	22%	37%	19%	22%
	Remainder of Region	-48%	-48%	-54%	-49%	20%	36%	20%	20%

Notes: $PM_{2.5}$ = fine particulate matter; PM = particulate matter; VMT = vehicle miles traveled; EMFAC = Emission Factor model. Percentages are rounded to the nearest whole number. Total $PM_{2.5}$ includes vehicle exhaust, break and tire wear, and entrained road dust. Emissions estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 or EN9 due to modeling.
Sources: Emissions modeling using EMFAC2021 and CT-EMFAC2021 emission rates and travel activity from MTC's travel model; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 3.4-15 summarizes MTC's analysis results using the more conservative emissions rates from EMFAC2017, expressed as a percentage change in TAC pollutants (diesel PM, benzene, and 1, 3 butadiene), $PM_{2.5}$ exhaust, and total $PM_{2.5}$ emissions when compared to the base year emissions for each county with an Overburdened Community and the entire region.

Table 3.4-15: Percent Change in On-Road Mobile Source Exhaust and Total $PM_{2.5}$ Emissions, Years 2023–2050 (EMFAC2017)

County	Overburdened Community Status	Exhaust Emissions				Non-Exhaust Emissions		Total $PM_{2.5}$	VMT
		$PM_{2.5}$	Diesel PM	Benzene	1,3 Butadiene	Break & Tire Wear	Entrained Road Dust		
Alameda	Overburdened Community	-38%	-29%	-51%	-46%	30%	30%	22%	24%
	Remainder of County	-46%	-37%	-57%	-53%	25%	25%	16%	19%
Contra Costa	Overburdened Community	-46%	-55%	-63%	-59%	12%	21%	9%	19%
	Remainder of County	-48%	-58%	-61%	-57%	11%	19%	8%	17%
Marin	Overburdened Community	-62%	-63%	-63%	-59%	3%	9%	-4%	8%
	Remainder of County	-64%	-65%	-65%	-61%	4%	10%	0%	9%
Napa	Overburdened Community	-53%	-56%	-59%	-56%	25%	44%	21%	40%
	Remainder of County	-68%	-71%	-71%	-69%	-4%	15%	-6%	14%

County	Overburdened Community Status	Exhaust Emissions				Non-Exhaust Emissions		Total $PM_{2.5}$	VMT
		$PM_{2.5}$	Diesel PM	Benzene	1,3 Butadiene	Break & Tire Wear	Entrained Road Dust		
San Francisco	Overburdened Community	-52%	-61%	-47%	-47%	19%	29%	24%	28%
	Remainder of County	-59%	-67%	-54%	-54%	3%	12%	2%	11%
San Mateo	Overburdened Community	-42%	-39%	-26%	-15%	35%	34%	32%	32%
	Remainder of County	-35%	-31%	-16%	-4%	24%	23%	46%	21%
Santa Clara	Overburdened Community	-47%	-42%	-53%	-47%	22%	24%	17%	21%
	Remainder of County	-39%	-35%	-43%	-35%	31%	32%	32%	29%
Solano	Overburdened Community	-51%	-45%	-68%	-67%	17%	22%	5%	16%
	Remainder of County	-52%	-45%	-72%	-70%	16%	21%	2%	15%
Sonoma	Overburdened Community	-70%	-77%	-76%	-73%	-12%	9%	-14%	7%
	Remainder of County	-68%	-78%	-72%	-70%	-6%	17%	-6%	15%
Total Bay Area	Overburdened Community	-46%	-45%	-55%	-51%	21%	25%	15%	22%
	Remainder of Region	-48%	-48%	-54%	-49%	19%	24%	17%	20%

Notes: $PM_{2.5}$ = fine particulate matter; PM = particulate matter; VMT = vehicle miles traveled; EMFAC = Emission Factor model. Percentages are rounded to the nearest whole number. Total $PM_{2.5}$ includes vehicle exhaust, break and tire wear, and entrained road dust. Emissions estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 or EN9 due to modeling.

Sources: Emissions modeling using EMFAC2017 and CT-EMFAC2017 emission rates and travel activity from MTC's travel model; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Overall TAC and $PM_{2.5}$ exhaust emissions from diesel and gasoline vehicles decrease throughout the Bay Area between existing conditions in 2023 and the proposed plan's horizon year 2050. Region-wide, for all TAC emissions (diesel PM, benzene, and 1, 3 butadiene), on-road vehicle exhaust is estimated to decrease between 48 and 54% in both the EMFAC2021 and EMFAC2017emissions estimates. Region-wide $PM_{2.5}$ emissions from all on-road vehicle exhaust are expected to decrease by approximately 48% in both emissions scenario estimates. The reductions in TAC and $PM_{2.5}$ exhaust emissions expected from 2023 to 2050 in Overburdened Communities and in areas without Overburdened Community status vary by county. Areas without Overburdened Community status are considered non-Overburdened Communities. As shown in **Table 3.4-12**, reductions in TAC and $PM_{2.5}$ exhaust emissions are greater in Overburdened Communities than non-overburdened communities. However, **Table 3.4-14** shows that there would be a disproportionate increase in overall emissions of benzene, 1,3 butadiene, entrained road dust, and breaks and tire wear emissions in Overburdened Communities in comparison to increases of the same pollutants in the remainder of the region using EMFAC2021-based emissions estimates. **Table 3.4-15** shows disproportionate increases of the same pollutants in Overburdened Communities using EMFAC2017-based emissions estimates.

Emissions reductions that could occur through 2050 are largely attributed to the implementation of CARB's On-Road Heavy-Duty Diesel Vehicle Regulations, which requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. As detailed in Section 3.4.2, "Regulatory Setting," California has withdrawn its request for a waiver and authorization for the addition of the ACF Regulation to its emissions control program. Notably, CARB is continuing to enforce the elements of the ACF Regulation that apply to State and local government fleets because these do not require a federal waiver or authorization. CARB is not enforcing the existing portions of the ACF Regulation that require a federal waiver or authorization, such as the portions of the ACF Regulation that apply to high-priority and drayage fleets. The portions of the ACF Regulation that apply to State and local agencies require that, as of January 1, 2024, State and local government fleets, including city, county, special district, and State agency fleets, are required to add ZEVs to the fleet as a percentage of their purchases each year. As of January 1, 2024, 50% of vehicle purchases must be ZEVs and 100% of purchases must be zero-emission starting January 1, 2027. Small government fleets (those with 10 or fewer vehicles) and those in designated counties must start their ZEV purchases beginning in 2027. Alternatively, State and local government fleet owners may elect to meet ZEV targets as a percentage of the total fleet starting with vehicle types that are most suitable for electrification.

Sources contributing TAC and $PM_{2.5}$ emissions reductions in the 27-year timeframe (2023–2050) also include:

- street sweeping, potentially reducing road dust emissions by 10%;
- cleaner locomotive engines;
- the Bay Area Air District's Rule 11-18, which will potentially reduce TACs from the East Bay Municipal Utility District and Schnitzer Steel by an estimated 70%; and
- better enforcement and incentives discouraging backyard burning and limiting residential fuel combustion.

Total $PM_{2.5}$ includes exhaust, as well as brake wear and tire wear, and entrained road dust. Emissions are estimated in both EMFAC2017 and EMFAC2021 for all vehicles.

Increases in total $PM_{2.5}$ emissions are generally higher for non-Overburdened Communities than Overburdened Communities. Based on EMFAC2021 emissions estimates, Overburdened Communities in Marin and Sonoma Counties would see an overall reduction in total $PM_{2.5}$ emissions (-2% and -13%, respectively). When all sources of $PM_{2.5}$ are aggregated, the anticipated $PM_{2.5}$ emissions would increase over existing conditions by 19% in Overburdened Communities and 20% in the remaining region.

Based on EMFAC2017emissions estimates, Overburdened Communities in Marin and Sonoma Counties would see an overall reduction in total $PM_{2.5}$ emissions (-4% and -14%, respectively). When all sources of $PM_{2.5}$ are aggregated, the anticipated $PM_{2.5}$ emissions would increase over existing conditions by 15% in Overburdened Communities and 17% in the remaining region.

As stated in the thresholds discussion above, a significant impact would occur if the proposed plan would cause a cumulative net increase in emissions of TACs compared to existing conditions or result in an increase in TAC and $PM_{2.5}$ emissions in Overburdened Communities. Therefore, this increase in total $PM_{2.5}$ emissions in both Overburdened Communities and the remaining region would be a potentially significant impact (PS).

This outcome may be explained by a number of factors. Emissions from gasoline and diesel on-road vehicles have been substantially reduced by stringent State and federal exhaust emission standards. According to EMFAC2021 model runs for the MTC region, brake and tire wear from passenger vehicles is expected to represent approximately 20% of $PM_{2.5}$ from vehicles by 2050, while tire wear from vehicles is expected to represent approximately 10% of mobile source $PM_{2.5}$ by 2050 (not including entrained road

dust emissions). According to EMFAC2017 model runs for the MTC region, brake wear from vehicles is expected to represent approximately 50% of mobile source $PM_{2.5}$ emissions by 2050, while tire wear from vehicles is expected to represent approximately 6% of mobile source $PM_{2.5}$ by 2050 (not including entrained road dust emissions). At the time of this writing, no regulations have been adopted that would reduce future levels of PM from tire and brake wear emissions. Therefore, EMFAC2017 and EMFAC2021 do not consider any improvements in brake and tire wear emissions in future year's emission estimates. This means that as VMT increases, so would $PM_{2.5}$ emissions from brake and tire wear.

Conclusion

Implementation of the proposed plan's land use growth footprint and transportation projects could expose sensitive receptors to substantial concentrations of TAC emissions; implementation of sea level rise adaptation projects are not anticipated to result in significant impacts to sensitive receptors. At this plan-level of analysis, the exact future locations of new TAC sources and new receptors under the proposed plan cannot be known at this time. Therefore, it is conservatively assumed that land use development under the proposed plan would result in new sensitive receptors close (within the distance buffers identified by CARB) to TAC sources. This is attributable to the proposed plan's focus on compact development that can result in the proximity of new sensitive receptors to localized sources of TACs, potentially resulting in exposure to substantial TAC concentrations.

Although exhaust-related emissions would decrease in both Overburdened Communities and non-Overburdened Communities, total $PM_{2.5}$ emissions would increase in the plan area as would total $PM_{2.5}$ emissions in the multiple Overburdened Communities (see **Table 3.4-14 and Table 3.4-15**, above). The projected increase in total $PM_{2.5}$ emissions in these Overburdened Communities from 2023 to 2050 would constitute a change in $PM_{2.5}$ exposure levels that disproportionally affect Overburdened Communities and would exacerbate an existing hazard to Overburdened Communities which are currently exposed to a disproportionately high concentration of air toxics Further, the proposed plan's addition of receptors into these communities would further exacerbate the issue of receptors in these communities being exposed to disproportionately high concentrations of TACs. Given the limitations of modeling tools and assumptions, sensitive receptor exposure numbers are an indication of relative exposure, and not a precise prediction. The use of EMFAC2017 and EMFAC2021 to estimate TAC emissions and related health risks was done to account for a potential future scenario where California does not implement its mobile-source regulations for which their waivers under the CAA have been rescinded. Should some or all of the State's mobile-source regulations be implemented, health risks would likely be lower than those described above.

For these reasons, this impact would be **potentially significant (PS)** in 2050. Mitigation Measures AQ-4(a) through AQ-4(d) address this impact and are described below.

Mitigation Measures

Implement Mitigation Measure AQ-2.

Mitigation Measure AQ-4(a) When locating sensitive receptors in TAC risk areas, as identified in **Figure 3.4-1**, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- Install, operate and maintain in good working order a central heating, ventilation, and air conditioning (HVAC) system or other air intake system in the building, or in each individual unit, that meets or exceeds a minimum efficiency reporting value (MERV) of 13 (MERV-16 for projects located in the West Oakland Specific Plan area) or higher (BAAQMD 2016). The HVAC system shall include the following features: installation of a high-efficiency filter and/or carbon filter to filter particulates and other

chemical matter from entering the building; either high-efficiency particulate air (HEPA) filters or American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) certified 85% supply filters shall be used.

- Reduce emissions from diesel trucks through implementing the following measures, if feasible:
  - installing electrical hook-ups for diesel trucks at loading docks;
  - requiring trucks to use transportation refrigeration units that meet Tier 4 emission standards;
  - requiring truck-intensive projects to use advanced exhaust technology (e.g., hybrid) or alternative fuels;
  - prohibiting trucks from idling for more than 2 minutes;
  - establishing truck routes to avoid sensitive receptors in the project; and
  - implementing a truck route program, along with truck calming, parking, and delivery restrictions.
- Install passive electrostatic filtering systems with low air velocities (i.e., less than 1 mph).
- Phase residential developments when proposed within 500 feet of freeways such that homes nearest the freeway are built last, if feasible.
- Locate sensitive receptors as far away from truck activity areas, such as loading docks and delivery areas, as feasible.
- Ensure that existing and new standby or emergency diesel generators meet CARB's Tier 4 emission standards, if feasible.
- Locate individual and common exterior open space and outdoor activity areas proposed as part of individual projects as far away as possible from emission source within the project site boundary, face them away major freeways, and shield them from the source (i.e., the roadway) of air pollution with buildings or otherwise buffer them to further reduce air pollution for project occupants.
- Locate air intakes and design windows to reduce PM exposure (e.g., windows nearest to the roadway do not open).
- If sensitive receptors are located near a distribution center, do not locate residents immediately adjacent to a loading dock or where trucks concentrate to deliver goods.
- Locate sensitive receptors in buildings in areas upwind of major roadway traffic to reduce exposure to reduce cancer risk levels and exposure to $PM_{2.5}$.
- Plant trees and/or vegetation between sensitive receptors and pollution source. Trees that are best suited to trapping PM shall be planted, including one or more of the following species: pine (*Pinus nigra* var. *maritima*), cypress (x *Cupressocyparis leylandii*), hybrid popular (*Populus deltoids* x *trichocarpa*), California pepper tree (*Schinus molle*), and redwood (*Sequoia sempervirens*).
- Reduce emissions from diesel trucks by establishing truck routes to avoid residential neighborhoods or other land uses serving sensitive populations, such as hospitals, schools, and child care centers. A truck route program, along with truck calming, parking and delivery restrictions, shall be implemented to direct traffic activity at non-permitted sources and large construction projects.

These measures are consistent with recommendations in the Bay Area Air District's CEQA Guidelines (BAAQMD 2023a) and Planning Healthy Places (BAAQMD 2016).

Mitigation Measure AQ-4(b) MTC and ABAG shall partner with the Bay Area Air District and local lead agencies to develop a program to install air filtration devices in existing residential buildings, and other buildings with sensitive receptors, located near freeways or sources of TACs and $PM_{2.5}$.

Mitigation Measure AQ-4(c) MTC and ABAG shall partner with the Bay Area Air District to develop a program to provide incentives to replace older locomotives and trucks in the region to reduce TACs and $PM_{2.5}$.

Mitigation Measure AQ-4(d) The implementing agency shall implement the strategies identified in the CARB Technical Advisory to reduce air pollution exposure near high-volume roadways to less-than-significant levels, where feasible. Examples of effective strategies include (CARB 2017):

- using speed reduction mechanisms, such as roundabouts to reduce the frequency of stop-and-go driving common among streets that support stop signs;
- using traffic signal management to limit the frequency of stop-and-go driving and vehicle idling;
- establishing and enforcing speed limit reductions of high-speed roadways;
- using design elements that promote air flow and pollutant dispersion along street corridors to optimize air flow, building downwash, and pollution dispersal;
- incorporating bike lanes and sidewalks to promote alternative, zero-pollution modes of transportation; and
- constructing solid barriers directly adjacent to high-volume roadways, such as sound walls to improve downwash.

Significance after Mitigation

Implementation of Mitigation Measure AQ-2 would minimize emissions of TACs by requiring best practices for exhaust emissions through the use of readily available, lower-emitting diesel equipment, and/or equipment powered by alternative cleaner fuels (e.g., propane) or electricity, as well as on-road trucks using particulate exhaust filters. Mitigation Measure AQ-4(a) would reduce the amount of TAC emissions that sensitive receptors would be exposed to through actions such as requiring setback distances between receptors and sources of TAC emissions (studies show that diesel PM is highly dispersive and that concentrations of diesel PM decline with distance from the source [e.g., 500 feet from a freeway, the concentration of diesel PM decreases by 70%] [Roorda-Knape et al. 1999; Zhu et al. 2002, cited in CARB 2005:9]), as well as by improving building air filtration systems and routing truck trips away from residential neighborhoods. Mitigation Measure AQ-4(b) would reduce the exposure of existing receptors to substantial concentrations of TAC emissions by facilitating air filtration improvements in existing buildings near TAC sources. Mitigation Measure AQ-4(c) would reduce TAC emissions generated by older locomotives and trucks by facilitating incentives to replace them with newer models that have improved emissions control technologies, or have zero-emissions in the case of electric trains and trucks. Lastly, Mitigation Measure AQ-4(d) would reduce the exposure of sensitive receptors to substantial TAC concentrations by improving transportation efficiency to reduce vehicle exhaust emissions through methods such as improving traffic flow efficiency, promoting alternative transportation methods, such as biking and walking, and implementing physical barriers along high-volume roadways to decrease emissions dispersion. The vehicle speed reduction measures listed under Mitigation Measure AQ-4(d) would result in reduced stop-and-go driving and hard accelerations thereby reducing emissions rates. Although each vehicle reaches its optimal fuel economy at a different speed (or range of speeds), gas mileage usually decreases rapidly at speeds above 50 mph. Aggressive driving (speeding, rapid acceleration and braking) wastes gas and lowers gas mileage by approximately 15–30% at highway speeds and 10–40% in stop-and-go traffic (Oak Ridge National Laboratory 2017).

Site-specific analysis would be needed when a project is proposed in the plan area to determine the actual level of exposure and whether feasible mitigation exists for the project to implement to reduce its level of cancer risk exposure to less than 100 in a million and $PM_{2.5}$ concentrations less than 0.8 $\mu g/m^3$.

The proposed plan could result in changes in total $PM_{2.5}$ exposure levels that disproportionally impact Overburdened Communities. These impacts would vary across counties.

The mitigation measures identified above would result in reduced emissions and lower exposure levels near sensitive receptors. Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, the exact reductions are not known at this time. Therefore, this impact would be **significant and unavoidable (SU).**

Impact AQ-5: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction

The level of impact associated with odor emissions depends on numerous factors, including: the frequency, intensity, duration, offensiveness, and location of the source; wind speed and direction; and the sensitivity of the receptors. Offensive odors can be unpleasant and can lead to distress among members of the public. In addition, manifestations of a person's reaction to offensive odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

Individual descriptions of an odor reflect the nature of the smell experience. If a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the concentration in the air. When an odor sample is progressively diluted, the odor concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odor reaches a level that is no longer detectable.

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. Odor sources commonly associated with negative human response include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, food packaging plants, and cannabis. Several of these sources are located in the plan area of the proposed plan.

Project-related construction activities could result in odorous diesel exhaust emissions from construction equipment and odors associated with asphalt paving. Construction equipment and processes are generally similar between land use and transportation projects. Construction-generated odorous emissions, however, would be temporary and not be generated at any one location for an extended period. Diesel exhaust fumes would also dissipate rapidly from the source with an increase in distance. Therefore, these activities would not result in the frequent exposure of receptors to objectionable odorous emissions, and this would be a less-than-significant (LTS) impact.

Operation

Projected development associated with the proposed plan is generally related to new housing, commercial facilities, and transportation-related projects (e.g., extension of rail, widening of roadways, improvements to interchanges). These types of projects typically would not introduce new operational sources of odors to the area. However, facilities that may emit objectionable odors would be subject to local zoning designations that limit odiferous businesses to areas where substantial numbers of residents or other sensitive receptors would not be affected (e.g., commercial areas). Furthermore, Bay Area Air District Regulation 7, Odorous Substances; NSCAPCD Rule 400(a), "Public Nuisance," and YSAQMD Rule 2.5, "Nuisance," place general limitations on odorous substances and specific emission limitations on certain odorous compounds. The regulation also provides a process for receiving odor complaints, identifying sources of objectionable odors, and assisting the owner or facility responsible for the odor to find a way to reduce emissions.

Jurisdictions may choose to adopt an optional air quality element or include policies related to air quality in other general plan elements. In general, local planning policies related to air quality are established to reduce exposure to air pollutants and safeguard public health and may address density; compact development; alternative transportation modes; energy conservation; cleaner-fuel vehicles; reductions for particulate emissions from roads, construction sites, and fireplaces; and public education programs. This impact would be less than significant (LTS).

Conclusion

Because objectionable odors associated with construction of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects would be regulated through air district regulations or would otherwise be temporary and because operational uses would be subject to local zoning ordinances as well as local air district permitting processes, this impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

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3.5 BIOLOGICAL RESOURCES

This section describes the common and sensitive vegetation, terrestrial wildlife, and aquatic biological resources known or with potential to occur in the plan area. Biological resources include common vegetation and habitat types, sensitive natural communities and other areas of ecological significance, and special-status plant and animal species. Potential impacts of plan implementation are analyzed, and mitigation measures are identified for those impacts determined to be significant. The information and analysis presented are regional in scope, as appropriate for a program-level EIR.

Comments received on the Notice of Preparation expressed the importance of analyzing effects on wildlife movement corridors, fish passage, threatened and endangered species and their habitats, tidal wetlands, and native plants, as well as the effects of artificial lighting, noise, and vibration on wildlife and sea level rise. These items are addressed in this section for the proposed plan. Effects of the alternatives are addressed in Chapter 4, "Alternatives."

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.5.1 Environmental Setting

SPECIAL-STATUS SPECIES

Special status- species are defined as species that are legally protected or that are otherwise considered sensitive by federal, State, or local resource agencies. The high diversity of vegetation and wildlife found in the Bay Area is a result of soil, topographic, and microclimate diversity that combine to promote relatively high levels of endemism.[1]This, in combination with the rapid pace of development in the region, has resulted in a relatively high degree of endangerment for local flora and fauna. Several species known to occur in the Bay Area are considered special-status species because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species are listed and receive specific protection defined in federal or State endangered species laws. Other species have not been formally listed as threatened or endangered but have been designated as "rare" or "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies, such as counties, cities, and special districts, to meet local conservation objectives.

[1] "Endemism" refers to the degree to which organisms or taxa are restricted to a geographical region or locality and are thus individually characterized as endemic to that area.

Special-status species are species, subspecies, or varieties in one or more of the following categories, regardless of their legal or protection status:

- officially listed by California under the California Endangered Species Act (CESA) or the federal government under the Endangered Species Act (ESA) as endangered, threatened, or rare;
- a candidate for State or federal listing as endangered, threatened, or rare under CESA or ESA;
- taxa (i.e., taxonomic category or group) that meet the criteria for listing, even if not currently included on any list, as described in CCR Section 15380 of the State CEQA Guidelines;
- species identified by the California Department of Fish and Wildlife (CDFW) as species of special concern;
- species listed as fully protected under the California Fish and Game Code;
- species afforded protection under local planning documents; and
- taxa considered by CDFW to be "rare, threatened, or endangered in California" and assigned a California Rare Plant Rank (CRPR) of 1 or 2. The CDFW system includes rarity and endangerment ranks for categorizing plant species of concern, and ranks 1 and 2 are summarized as follows:
  - CRPR 1A: plants presumed to be extinct in California;
  - CRPR 1B: plants that are rare, threatened, or endangered in California and elsewhere;
  - CRPR 2A: plants presumed to be extinct in California but common elsewhere; and
  - CRPR 2B: plants that are rare, threatened, or endangered in California but more common elsewhere.

The term "California species of special concern" is applied by CDFW to animals not listed under ESA or CESA but that are considered to be declining at a rate that could result in listing, or that historically occurred in low numbers and known threats to their persistence currently exist. CDFW's fully protected status was California's first attempt to identify and protect animals that were rare or facing extinction. Most species listed as fully protected were eventually listed as threatened or endangered under CESA; however, some species remain listed as fully protected but do not have simultaneous listing under CESA. Fully protected species may not be taken or possessed at any time and no take permits can be issued for these species except for scientific research purposes, for relocation to protect livestock, as part of a natural community conservation plan (NCCP), or if the project activities qualify for incidental take permitting under Section 2081.15 of the California Fish and Game Code.

A list of special-status plant and wildlife species was generated through a query of the California Natural Diversity Database (CNDDB), a California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants search, and a US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) electronic records search of the nine counties in the plan area (CNDDB 2025; CNPS 2025; USFWS 2025). Generalized habitat for these special-status plant and wildlife species that may occur in the plan area and their listing status are provided in **Table C-1** in Appendix C. Additional occurrences of special-status plant and animal species not reported in the CNDDB are likely and presumed to exist in habitats suitable for the species throughout the plan area.

CRITICAL HABITAT

The USFWS and National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) designate critical habitat for certain species that they have listed as threatened or endangered. "Critical habitat" is defined in Section 3(5)(A) of ESA as those lands (or waters) within a listed species' current range that contain the physical or biological features that are considered essential to the species' conservation, as well as areas outside the species' current range that are determined to be essential to its conservation. Critical habitat may include an area that is not currently occupied by the species but that may be needed for its recovery. Given the large scale at which critical habitat is mapped, it may also include areas that are not suitable for a species and would not be occupied. A critical habitat designation applies only to activities performed by federal agencies or that involve a federal permit, license, or funding, and that are likely to destroy or adversely affect the area of critical habitat. Critical habitat has been designated for 32 species in the Bay Area. Of these, critical habitat units for California red-legged frog, California tiger salamander, Central Coast steelhead, Alameda whipsnake, and marbled murrelet are the most widespread throughout the region.

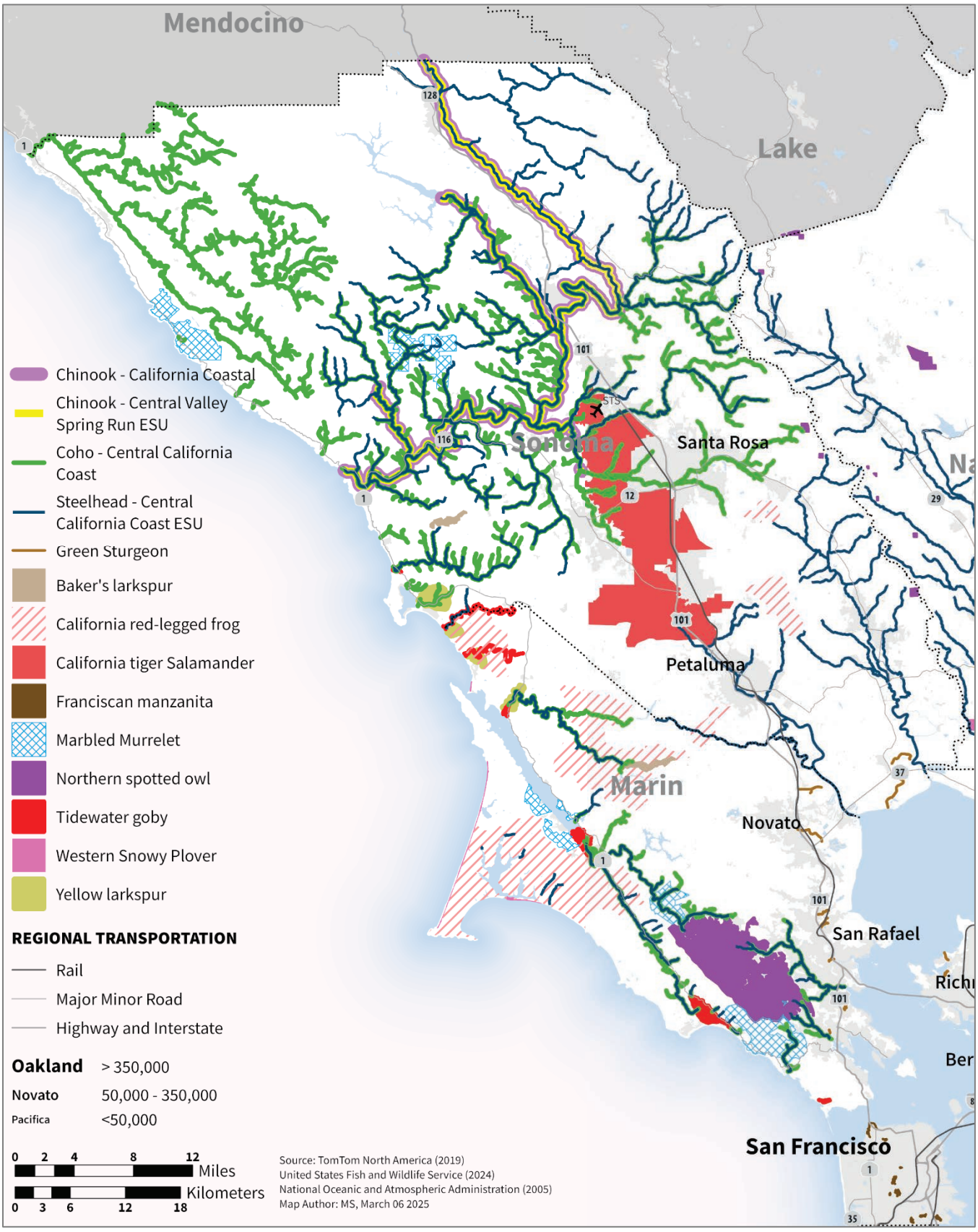
See **Figures 3.5-1 through 3.5-4** for the locations of critical habitat units throughout the Bay Area and **Table 3.5-1** for a summary of critical habitat by county.

SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those native plant communities that are defined by CDFW as having limited distribution statewide or within a county or region and that are often vulnerable to environmental effects of projects (CDFW 2018). These communities may not contain special-status plants or their habitat (CDFW 2018). CDFW designates sensitive natural communities based on their State rarity and threat ranking using NatureServe's Heritage Methodology. Natural communities with rarity ranks of S1 to S3, where S1 is critically imperiled, S2 is imperiled, and S3 is vulnerable, are considered sensitive natural communities to be addressed in the environmental review processes of CEQA and its equivalents (CDFW 2018). Oak woodlands are protected in California by State law and many local policies and plans, and federal, State, and most local agencies also consider wetlands and riparian habitat as sensitive communities.

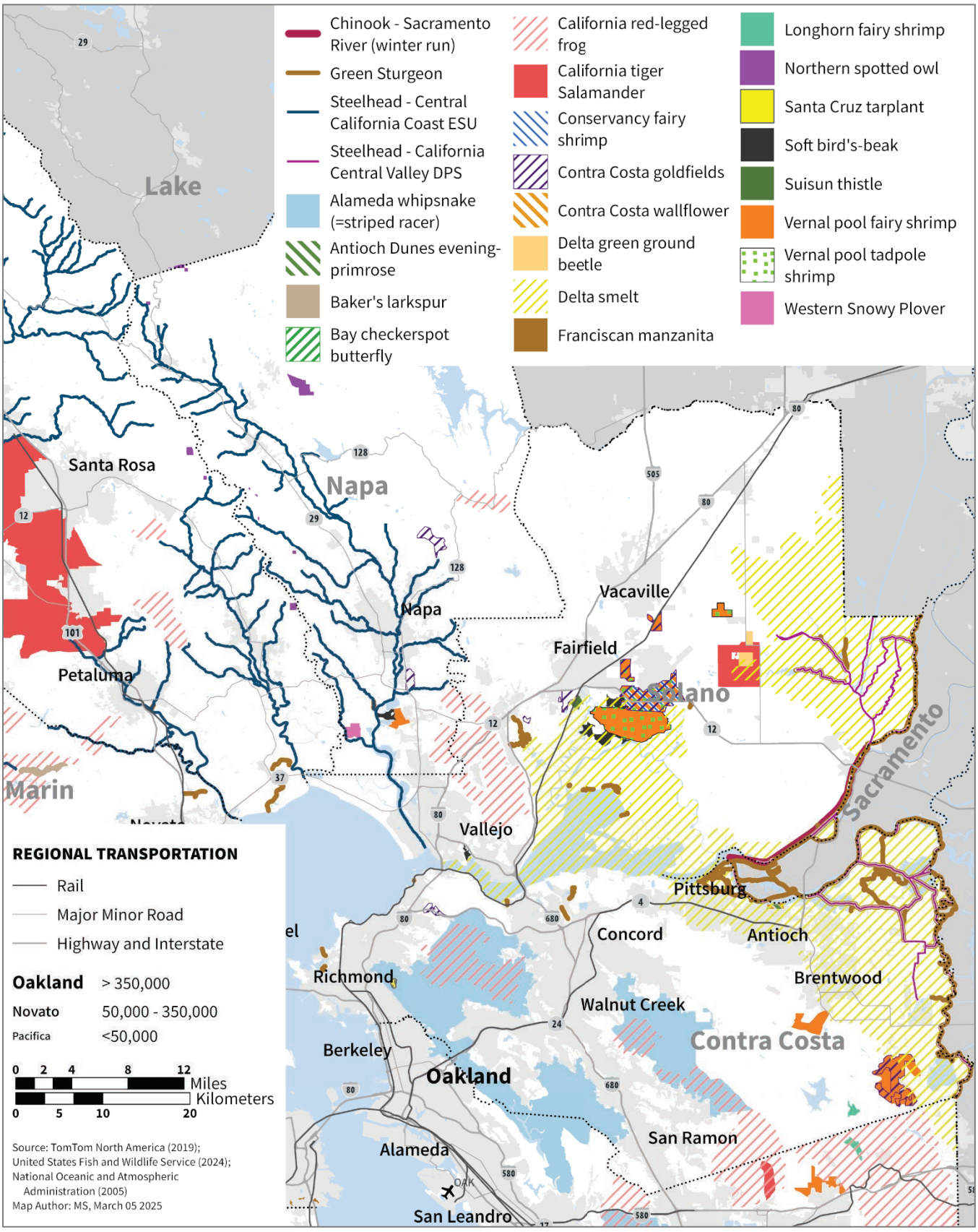
Sensitive natural communities are generally identified at the alliance level of vegetation classification hierarchy using the Manual of California Vegetation (Sawyer et al. 2009). No statewide law requires protection of all sensitive natural communities, but CEQA requires consideration of the potential impacts of a project on biological resources of statewide or regional significance. Sensitive natural communities in the Bay Area include coastal salt marsh; brackish and freshwater wetlands, including marshes, seasonal wetlands, and vernal pools; riparian forests and woodlands; and several types of coastal scrub, chaparral, and perennial grasslands.

Figure 3.5-1: Critical Habitat: Sonoma and Marin Counties



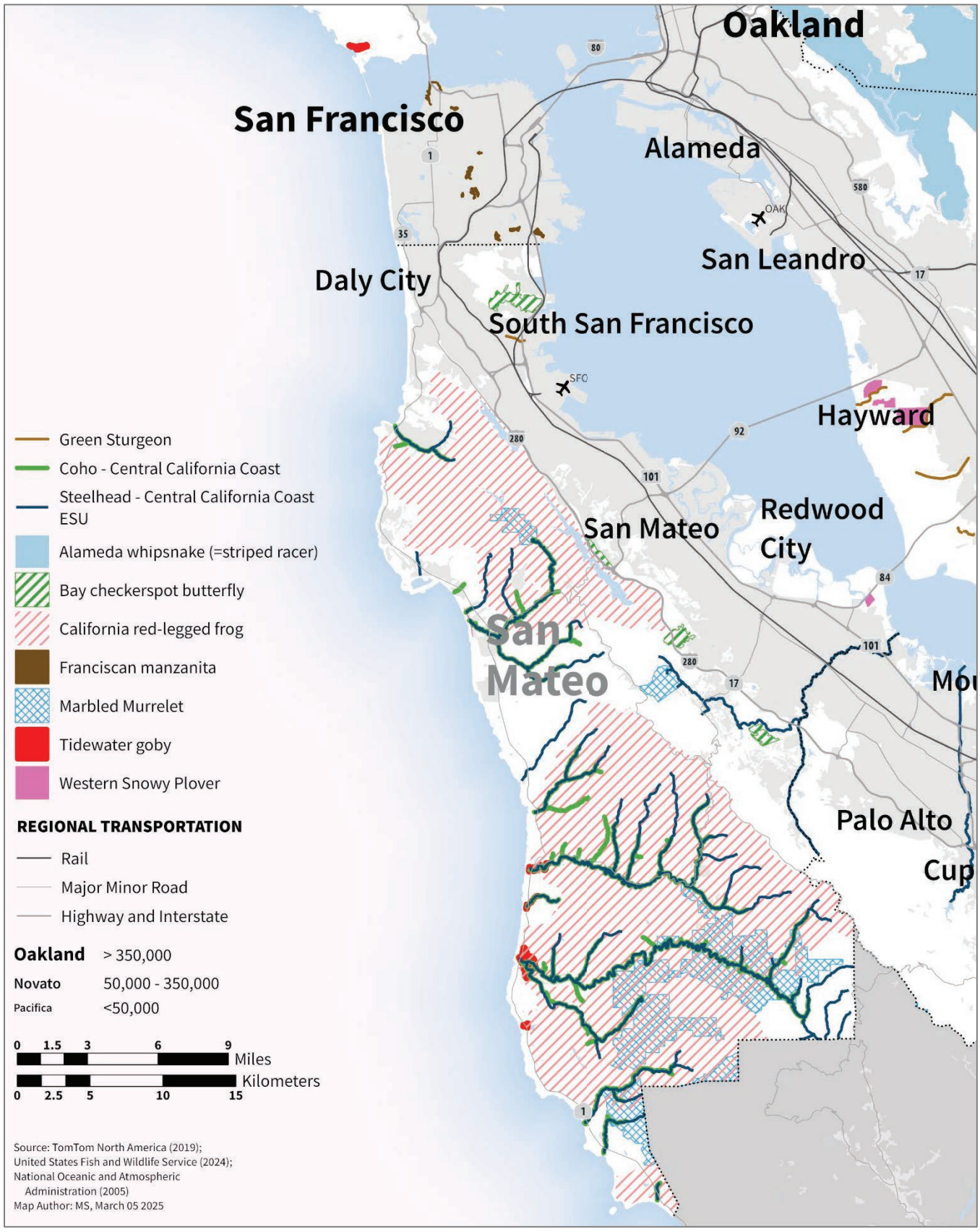
Sources: TomTom North America 2019; USFWS 2024; NOAA 2005.

Figure 3.5-2: Critical Habitat: Napa, Solano, and Contra Costa Counties



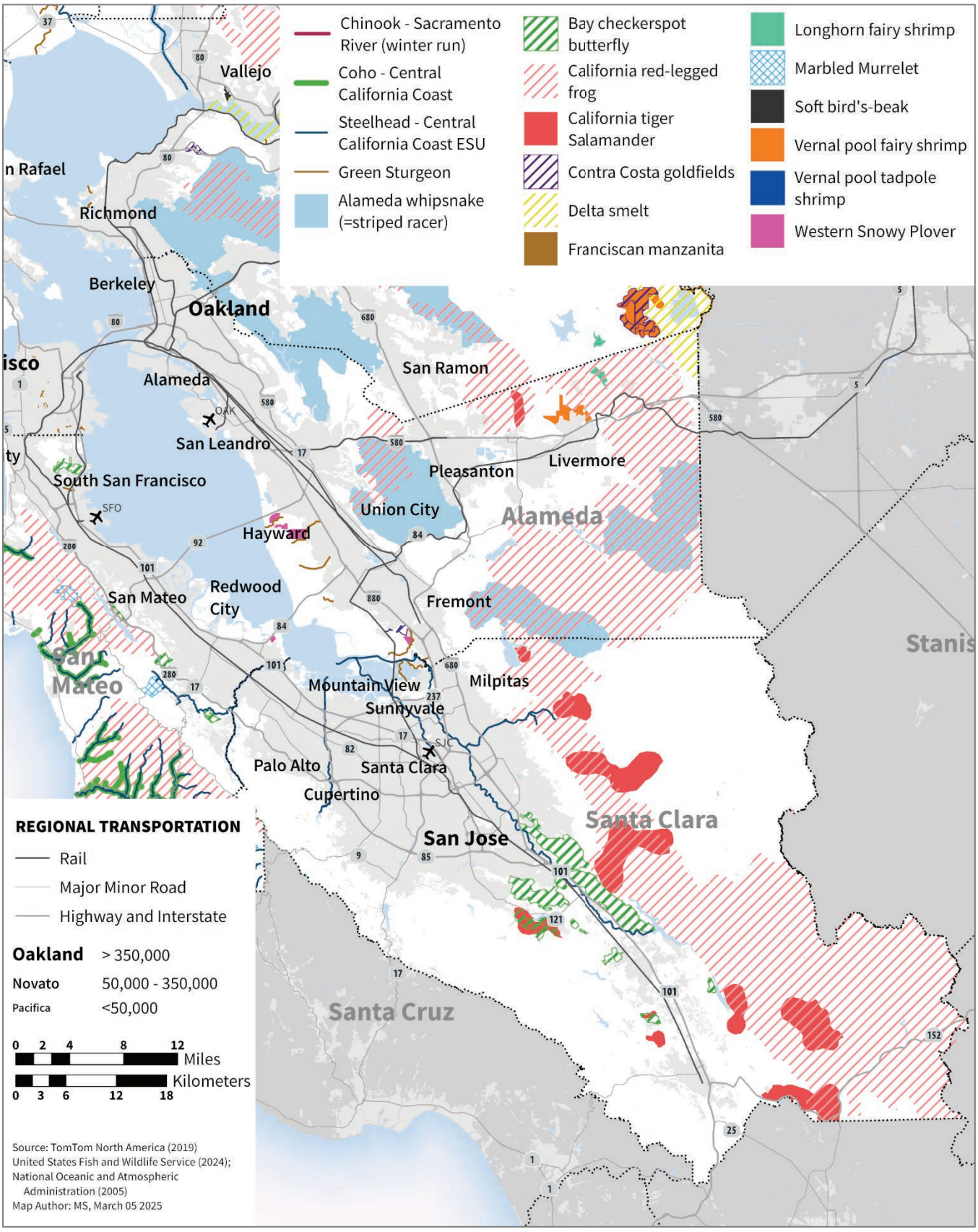
Sources: TomTom North America 2019; USFWS 2024; NOAA 2005.

Figure 3.5-3: Critical Habitat: San Francisco and San Mateo Counties



Sources: TomTom North America 2019; USFWS 2024; NOAA 2005.

Figure 3.5-4: Critical Habitat: Alameda and Santa Clara Counties



Sources: TomTom North America 2019; USFWS 2024; NOAA 2005.

Table 3.5-1: Critical Habitat in the Bay Area

Species	County								
	Contra Costa	Alameda	Santa Clara	San Mateo	San Francisco	Marin	Sonoma	Napa	Solano
Antioch Dunes evening primrose	✓								
Baker's larkspur						✓	✓		
Contra Costa goldfields	✓	✓						✓	✓
Contra Costa wallflower	✓								
Franciscan manzanita					✓				
Santa Cruz tarplant	✓								
Soft bird's beak	✓							✓	✓
Suisun thistle									✓
Yellow larkspur						✓	✓		
Delta smelt	✓	✓							✓
Green sturgeon southern DPS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chinook salmon California coastal ESU							✓		
Chinook salmon Central Valley spring-run ESU	✓								✓
Chinook salmon Sacramento River winter-run ESU	✓	✓		✓	✓	✓	✓		✓
Coho salmon Central California Coast ESU				✓		✓	✓		
Steelhead northern California DPS							✓		
Steelhead South/Central California Coast DPS			✓						
Steelhead Central California Coast DPS		✓	✓	✓		✓	✓	✓	✓
Steelhead California Central Valley DPS	✓								✓
Tidewater goby				✓		✓	✓		
Bay checkerspot butterfly			✓	✓					
Delta green ground beetle									✓
Conservancy fairy shrimp									✓
Longhorn fairy shrimp	✓	✓							
Vernal pool fairy shrimp	✓	✓						✓	✓
Vernal pool tadpole shrimp		✓							✓
California red-legged frog	✓	✓	✓	✓		✓	✓	✓	✓
California tiger salamander		✓	✓				✓		✓
Alameda whipsnake	✓	✓	✓						
Marbled murrelet			✓	✓		✓	✓		
Northern spotted owl						✓	✓	✓	
Western snowy plover		✓		✓		✓	✓	✓	

Notes: DPS = distinct population segment; ESU = evolutionarily significant unit.

NATURAL VEGETATION COMMUNITIES OF THE BAY AREA

The Bay Area supports numerous distinct natural vegetation communities[2] composed of a diversity of vegetative types that provide habitat for a wide variety of plant and wildlife species. Broad habitat categories in the region include grasslands, coastal scrub and chaparral, woodlands and forests, riparian systems and freshwater aquatic habitat, and wetlands. Urban and otherwise disturbed habitats, such as agricultural fields, also provide natural functions and values as wildlife habitat and are also considered in this EIR, as are the aquatic and estuarine resources of the Bay Area. The following discussion summarizes the natural communities located within the Bay Area and references special-status species associated with these communities.[3]

Grasslands

Natural Community Summary

Grasslands within the Bay Area include two basic types: nonnative annual grasslands and perennial grasslands, including, among others, serpentine bunchgrass and valley needlegrass grasslands (Holland 1986). Nonnative annual grasslands make up the vast majority of grassland habitat occurring throughout the Bay Area and consist of a sparse to dense cover of primarily introduced annual grasses associated with a variety of broadleaf herbs and, occasionally, native or introduced perennial grasses. The most abundant species are typically nonnative annual grasses in the genera *Bromus, Avena, Festuca*, and *Hordeum*. Broadleaf species common to Bay Area grasslands are quite variable but often include filaree (*Erodium* spp.), yellow star-thistle (*Centaurea solstitialis*), lupines (*Lupinus* spp.), peppergrass (*Lepidium* spp.), Indian paintbrush (*Castilleja* spp.), and California poppy (*Eschscholzia californica*). In addition to considerable site-to-site variation that is largely based on soils and management practices, there is also much year-to-year variation in species composition in response to the timing and amount of precipitation.

Serpentine bunchgrass and valley needlegrass grasslands are both native perennial grasslands with limited distribution in the Bay Area. The first has limited distribution because of its dependency upon serpentine soils, which are scattered throughout the Coast Ranges. Serpentine bunchgrass grasslands are most widespread in Marin County, on the San Mateo peninsula, and in southern Santa Clara County. This open grassland community is dominated by native perennial bunchgrasses of the genera *Bromus, Melica, Poa, Calamagrostis,* and *Festuca*. Native herbaceous associates include California poppy, tarweed (*Hemizonia* spp.), and lotus (*Lotus* spp.). Valley needlegrass grasslands typically occur on seasonally moist, fine-textured soils and often intergrade with oak woodland communities. This formerly extensive grassland type is dominated by clump-forming purple needlegrass (*Stipa pulchra*) and a variety of native and introduced grasses and herbs.

Grassland vegetation of all types are used by a wide variety of wildlife. Reptile species typically found in grasslands include western fence lizard (*Sceloporus occidentalis*), western terrestrial garter snake (*Thamnophis elegans*), and western rattlesnake (*Crotalus viridis*). Mammals within this habitat include black-tailed jackrabbit (*Lepus californicus*), western harvest mouse *(Reithrodontomys megalotis*), California vole (*Microtus californicus*), and coyote (*Canis latrans*). Bird species that use grasslands for foraging habitat include raptors such as turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*),

[2] Natural communities are assemblages of species that reoccur because of responses to similar combinations of environmental conditions and are not dependent on human intervention. For this discussion, native vegetation pertains to those species present in California before European settlement, whereas species such as wild oats and brome grasses, which were introduced with colonization and dominate much of the current California landscape, are considered nonnative. Vegetation communities dependent on human intervention, such as irrigated agriculture or landscaped or urbanized areas, are considered introduced communities.

[3] Certain plant and wildlife species are protected under federal and/or State endangered species laws or are otherwise protected through a variety of mechanisms. These species are collectively referred to as "special-status species." See Appendix C for categories of special-status species.

and red-tailed hawk (*Buteo jamaicensis*), as well as a variety of insect- and seed-eating birds, such as white-crowned sparrow (*Zonotrichia leucophrys*), Brewer's blackbird (*Euphagus cyanocephalus*), mourning dove *(Zenaida macroura*), meadowlark (*Sturnella neglecta*), and lesser goldfinch (*Carduelis psaltria*).

Special-Status Plants

Many special-status plant species associated with grasslands occur in particular microhabitats (e.g., specific soil or hydrologic conditions) or areas that support a relatively low abundance of introduced annual grasses and forbs. Many species are now restricted to serpentine soils or thin soils with low nutrient content that introduced species are unable to colonize. These include white-rayed pentachaeta (*Pentachaeta bellidiflora*), San Francisco popcorn flower (*Plagiobothrys diffusus*), most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*), Tiburon jewel-flower (*Streptanthus niger*), Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*), Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*), Contra Costa goldfields (*Lasthenia conjugens*), fountain thistle (*Cirsium fontinale* var. *fontinale*), Santa Cruz tarplant (*Holocarpha macradenia*), Marin western flax (*Hesperolinon congestum*), Brewer's western flax (*Hesperolinon breweri*), Diablo helianthella (*Helianthella castanea*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), caper-fruited tropidocarpum (*Tropidocarpum capparideum*), and recurved larkspur (*Delphinium recurvatum*). Most of these species may also occur in vegetation communities other than grassland with their distribution generally restricted to specific soil types, hydrologic regimes, elevation range, and geographic distribution. See **Table C-1** in Appendix C for a complete list of special-status species with potential to occur in the plan area.

Special-Status Wildlife

A variety of special-status wildlife species are associated with grassland habitats of the Bay Area, including Crotch's bumble bee (*Bombus crotchii*), western bumble bee (*Bombus occidentalis*), callippe silverspot butterfly (*Speyeria callippe callippe*), mission blue butterfly (*Icaricia icarioides missionensis*), bay checkerspot butterfly (*Euphydryas editha bayensis*), California tiger salamander (*Ambystoma californiense*), western spadefoot toad (*Scaphiopus hammondii*), California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), San Joaquin whipsnake (*Masticophis flagellum ruddocki*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus hudsonius*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), grasshopper sparrow (*Ammodramus savannarum*), and San Joaquin kit fox (*Vulpes macrotis mutica*).

Coastal Scrub and Chaparral

Natural Community Summary

Coastal scrub and sage scrub plant communities in the Bay Area are characterized on the basis of the dominant species: California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemesia californica*), coyote brush (*Baccharis pilularis*), and black sage (*Salvia mellifera*) (Sawyer et al. 2009). Coastal scrub communities are particularly dominant in the drier southern slopes and on exposed rocky slopes and bluffs within the Coast Ranges in the Bay Area. Coastal scrub is best considered as a collection or assemblage of different vegetation series, with various intergrades between the above-described plant communities. Coastal scrubs often intergrade with various chaparral types and occur in a vegetative mosaic with grasslands and woodlands based on soil type, slope, aspect, and available moisture. Generally, these are communities of dense, low shrubs with sparse understory except in scattered grassy openings.

Chaparral is dominated by hard-leaved evergreen shrubs, generally with little or no herbaceous ground cover or overstory trees. Chamise (*Adenostoma fasciculatum)* and a variety of manzanita species (*Arctostaphylos* spp.) are the dominant or codominant species throughout Bay Area chaparral communities. Gaps in chaparral support primarily grassland species, ranging from nonnative herbaceous annuals and grasses to native perennial bunchgrasses, small ferns, and bulbiferous species.

Coastal scrub and chaparral habitat provide dense vegetative cover for many common small mammals and reptiles, including deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), brush rabbit (*Sylvilagus bachmani*), western fence lizard, common garter snake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getulus*), and western rattlesnake. Bird species that nest in shrub dominated habitats include California quail (*Callipepla californica*), California scrub jay (*Aphelocoma californica*), bushtit (*Psaltriparus minimus*), California thrasher (*Toxostoma redivivum*), spotted towhee (*Pipilo maculatus*), sage sparrow (*Amphispiza belli*), and Bewick's wren (*Thryomanes bewickii*). Coastal scrub and chaparral provide important foraging habitat for black-tailed deer (*Odocoileus hemionus columbianus*) and other large mammals that prey upon smaller mammals and reptiles in scrub and chaparral habitat, including coyote, gray fox (*Urocyon cinereoargenteus*), and raccoon (*Procyon lotor*).

Special-Status Plants

Similar to Bay Area grasslands, distribution of rare plants and wildlife in scrub and chaparral communities often coincides with the distribution of uncommon geological features. In the case of coastal scrub plant communities, an array of plants and wildlife have adapted to serpentine-derived soils in both scrub habitats and grasslands. Conditions such as slope, aspect, precipitation, temperature, degree of exposure, and the presence of suitable soil conditions often control the distribution of rare species.

Special-status serpentine-adapted scrub species include coyote ceanothus (*Ceanothus ferrisae*), Presidio clarkia (*Clarkia franciscana*), Nicasio ceanothus (*Cenothus decomutus*), Mt. Diablo bird's beak (*Cordylanthus nidularius*), Marin checker lily (*Fritillaria affinis* var. *tristulis*), fragrant fritillary (*Fritillaria liliacea*), Crystal Springs lessingia (*Lessingia arachnoidea*), smooth lessingia (*Lessingia micradenia* var. *glabrata*), Sharsmith's harebell (*Campanula sharsmithiae*), Marin checkerbloom (*Sidalcea hickmanii* var. *viridis*), San Francisco campion (*Silene verecunda* var. *verecunda*), pink creamsacs (*Castilleja rubicundula* var. *rubicundula*), Tiburon paintbrush, and Tamalpais jewel-flower (*Streptanthus batrachopus*). Plants not specifically adapted to serpentine habitats include Mt. Day rockcress (*Boechera rubicundula*), San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*), woolly-headed spineflower (*Chorizanthe cuspidata* var. *villosa*), yellow larkspur (*Delphinium luteum*), supple daisy (*Erigeron supplex*), Mt. Diablo buckwheat (*Eriogonum truncatum*), coast wallflower (*Erysisum ammophilum*), robust monardella (*Monardella villosa* var. *globosa*), Lime Ridge navarretia (*Navarretia gowenii*), Marin County navarretia (*Navarretia rosulata*), Napa checkerbloom (*Sidalcea hickmanii* ssp. *napaensis*), north coast phacelia (*Phacelia insularis* var. *continentis*), and Metcalf Canyon jewel flower (*Streptanthus albidus* ssp. *albidus*). In addition to these species, 17 species of manzanita and nine species of ceanothus considered to be of special status occur in Bay Area chaparral habitats.

Special-Status Wildlife

Relatively few special-status wildlife species are found within coastal scrub or chaparral habitats. Some of these are highly specialized invertebrates whose life histories are intimately dependent upon serpentine-associated species, including callippe silverspot butterfly and two non-serpentine-dependent species, San Bruno elfin butterfly (*Incisalia mossii bayensis*) and mission blue butterfly.

In Contra Costa, Alameda, and northeastern Santa Clara counties, chaparral and scrub habitats and adjacent grasslands support Alameda whipsnake, which is federally and State listed as threatened. Other special-status wildlife occurring in Bay Area chaparral and scrub communities include northern California legless lizard (*Aniella pulchra*), California glossy snake (*Arizona elegans occidentalis*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), northern California ringtail (*Bassariscus astutus*), pallid bat (*Antrozous pallidus*), and coast horned lizard (*Phrynosoma blainvillii*). See **Table C-1** in Appendix C for a complete list of special-status species with potential to occur in the plan area.

Woodlands and Forest

Natural Community Summary

The diverse topography, soils, and climate of the Bay Area region support a wide range of woodland and forest types, from the oak savannas of the dry interior to the redwood forests of the coastal hills and mountains.

Bay Area woodlands either are dominated by a single oak species, including coast live oak (*Quercus agrifolia*), blue oak (*Quercus douglasii*), California black oak (*Quercus kelloggii*), or valley oak (*Quercus lobata*), or are classified as mixed hardwood woodlands composed of a variety of tree species, including one or more oaks, and most often, big-leaf maple (*Acer macrophyllum*), tan oak (*Notholithocarpus densiflorus*), California bay (*Umbellaria californica*), madrone (*Arbutus menziesii*), and California buckeye (*Aesculus californica*). Woodland understory vegetation is dependent on canopy cover, which can range from oak savanna with widely spaced trees and annual grasslands as understory, to a denser but still relatively open mixed woodland canopy often seen on north- and east-facing slopes or in canyons, which supports both shrubs and herbaceous vegetation. Here the shrub layer of the understory often contains toyon (*Heteromeles arbutifolia*), snowberry (*Symphoricarpos albus*), poison oak (*Toxicodendron diversilobum*), gooseberry (*Ribes* spp.), ocean spray (*Holodiscus discolor*), and California blackberry (*Rubus ursinus*). The herb layer can consist of nonnative grasses, such as soft chess (*Bromus mollis*) and ripgut brome (*Bromus diandrus*), and perennial native bunchgrasses, such as blue wildrye (*Elymus glaucus*), intermixed with native and nonnative wildflowers, including mission bells (*Fritillaria affinis*), chickweed (*Stellaria media*), bedstraw (*Galium aparine*), mugwort (*Artemesia douglasiana*), fiesta flower (*Pholistoma auritum*), and miner's lettuce (*Claytonia perfoliata*). Where canopy cover is most dense, understory is sparse or absent and is typically made up of herbaceous species.

Bay Area oak and mixed woodlands provide water, foraging, nesting, cover, and migratory and dispersal corridors for a variety of wildlife species. Insect eaters such as ash-throated flycatcher (*Myiarchus cinerascens*), oak titmouse (*Parus inornatus*), and dark-eyed junco (*Junco hyemalis*) are woodland foliage gleaners. Bark gleaner species, such as California scrub jay, Steller's jay (*Cyanocitta stelleri*), and acorn woodpecker (*Melanerpes formicivorus*), feed on insects, as well as acorns. California quail and California towhee (*Pipilo crissalis*) are ground foragers in this habitat. Cooper's hawk (*Astur cooperi*) and sharp-shinned hawk (*Accipiter striatus*) are often associated with woodland habitat, where they hunt small birds. Mammals such as gray squirrel (*Sciurus griseus*) forage and nest in the canopy of the trees, whereas long-tailed weasels (*Mustela frenata*) hunt on the ground for shrews (*Sorex* spp.) and California voles. Larger mammals, such as black-tailed deer, use the oak understory for shelter and food from acorns, berries, and foliage. Amphibians such as Pacific slender salamander (*Batrachoseps attenuatus*), arboreal salamander (*Aneides lugubris*), and ensatina (*Ensatina eschscholtzii*) live under the cover of fallen leaf litter.

Bay Area forest types are generally found at higher elevations of the Coast Ranges in areas with adequate moisture and are either dominated by a mix of hardwood species on drier slopes, as noted above for mixed woodlands, sometimes with one or more coniferous tree species, including coast redwood (*Sequoia sempervirens*) and Douglas fir (*Pseudotsuga menziesii*), or are dominated by conifers, with tanoak and big-leaf maple as common associates. Typical understory species include wood rose (*Rosa gymnocarpa*), coastal wood fern (*Dryopteris arguta*), ocean spray, bracken fern (*Pteridium aquilinum*), yerba buena (*Clinopodium douglasii*), hazelnut (*Corylus cornuta*), creeping snowberry (*Symphoricarpos mollis*), and poison oak. Blue blossom (*Ceanothus thyrsiflorus*) and toyon are common in sunnier openings.

Redwood forest typically occupies coastal areas where fog drip and precipitation create moist and humid conditions. Redwood and Douglas fir dominate the canopy, their fallen needles forming a thick layer of duff. Several hardwood tree species are also associated with redwood forest, including tanoak, California bay, big-leaf maple, madrone, and several oak species. The redwood forest understory is often sparse

where canopy is dense, and slopes are steep but contains a diversity of species generally not found in adjacent plant communities. These include huckleberry (*Vaccinium ovatum*), hazelnut, thimbleberry (*Rubus parviflorus*), sword fern (*Polystichum munitum*), and redwood sorrel (*Oxalis oregana*). Redwood violet (*Viola sempervirens*), western trillium (*Trillium ovatum*), red clintonia (*Clintonia andrewsiana*), and several fern species often occur on moister slopes along ravines.

Mixed hardwood forest wildlife is similar to that described above for woodland habitats. Redwood and Douglas fir forest wildlife is generally lower in diversity than other forest types, in part because the canopy density of second-growth forest precludes the establishment of many understory plants. Moist conditions in the understory support amphibians, such as yellow-eyed salamander (*Ensatina eschscholzii xanthopicta*) and California slender salamander (*Batrachoseps attenuatus*), as well as coastal rubber boa (*Charina bottae*). Birds found in the redwood forest include brown creeper (*Certhia americana*), varied thrush (*Ixoreus naevius*), chestnut-backed chickadee (*Poecile rufescens*), and Steller's jay.

Special-Status Plants

Special-status plant species associated with woodland habitats are often also found in adjacent chaparral and scrub habitats. In the Bay Area, these species include Anderson's manzanita (*Arctostaphylos andersonii*), rayless ragwort (*Senecio aphanactis*), hooked popcorn-flower (*Plagiobothrys uncinatus*), Mt. Diablo phacelia (*Phacelia phacelioides*), Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*), showy madia (*Madia radiata*), Mt. Hamilton lomatium (*Lomatium observatorium*), Jepson's linanthus (*Linanthus jepsonii*), coast lily (*Lilium maritimum*), Contra Costa goldfields, drymaria-like western flax (*Hesperolinon drymarioides*), Diablo helianthella, talus fritillary (*Fritillaria falcata*), Hillsborough chocolate lily (*Fritillaria biflora* var. *ineziana*), San Mateo woolly sunflower (*Eriophyllum latilobum*), Brandegee's eriastrum (*Eriastrum brandegeae*), western leatherwood (*Dirca occidentalis*), Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*), robust spineflower (*Chorizanthe robusta* var. *robusta*), Keck's checkerbloom (*Sidalcea keckii*), big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), Marin manzanita (*Arctostaphylos virgata*), twisted horsehair lichen (*Bryoria spiralifera*), Mt. Diablo fairy lantern (*Calochortus pulchellus*), large-flowered fiddleneck (*Amsinckia grandiflora*), and Sharsmith's onion (*Allium sharsmithae*).

Special-Status Wildlife

Special-status wildlife species associated with woodlands include those described for grassland and riparian habitats, as well as purple martin (*Progne subis*) and other species, such as tree swallow (*Tachycineta bicolor*), Bullock's oriole (*Icterus bullockii*), and many other nesting birds, which are protected under the Migratory Bird Treaty Act and the California Fish and Game Code (see Section 3.5.2, "Regulatory Setting," below). Bay Area forests in San Mateo, Marin, Sonoma, and Napa counties support the federally listed and State-listed marbled murrelet (*Brachyramphus marmoratus*) and the federally listed and California species of special concern northern spotted owl (*Strix occidentalis caurina*). Special-status amphibians that may occur within forest and woodland habitats include California giant salamander (*Dicamptodon ensatus*) and Santa Cruz black salamander (*Aneides niger*). Forest and woodland habitats in the Bay Area also support special-status mammal species, including Sonoma tree vole (*Arborimus pomo*), northern California ringtail, and mountain lion (*Puma concolor*).

Riparian

Natural Community Summary

Riparian plant communities are tree- or shrub-dominated communities that occur along streams, rivers, and other aquatic features. Riparian forests, woodlands, and scrub are often separated from one another depending on the amount and density of tree canopy versus shrub canopy. Forests support a closed or nearly closed canopy of trees with variable understory, while woodlands have an open canopy of trees with an understory that is primarily grassy or herbaceous. Shrubs, rather than trees, dominate riparian

scrub habitat, which is common both in the coastal mountains of San Mateo, Marin, and Sonoma counties and in the more arid regions of the east and south Bay Area. The composition and density of riparian vegetation is very much dependent upon the duration of flowing or near-surface water, the amplitude and periodicity of flow (brief, high-velocity flows versus more sustained flows), and the texture of the substrate (cobble, gravel, sand, silt, clay). Different reaches of a stream may support different types of riparian vegetation. The major rivers, streams, and other surface waters that support riparian vegetation in the Bay Area are presented in **Figure 3.10-1** of Section 3.10, "Hydrology and Water Quality." The most well-developed riparian vegetation occurs in relatively undisturbed reaches of the largest Bay Area streams, including Sonoma Creek, the Russian River, the Napa River, Putah Creek, Alameda Creek, Coyote Creek, the Guadalupe River, San Francisquito Creek, Llagas Creek, and others listed in Section 3.10.

Typical dominant species in the forest, woodland, and scrub habitats along Bay Area rivers and streams are Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), various species of willow (*Salix* spp.), coast live oak, valley oak, and white alder (*Alnus rhombifolia*). Where they are not modified by urbanization, lower stream reaches typically intergrade into broad freshwater to brackish emergent wetlands dominated by cattails (*Typha* spp.) and bulrush (*Scirpus* spp.). Where the riparian habitat has been degraded, through either alteration of the hydrology or direct disturbance to vegetation, including along many urban stream reaches, the nonnative blue gum eucalyptus (*Eucalyptus globulus*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), perennial pepperweed (*Lepidium latifolium*), giant reed (*Arundo donax*), or French broom (*Genista monspessulana*) are often dominant, as seen in portions of most large Bay Area streams. Upper stream reaches are also often lacking riparian cover because of long-standing grazing, agricultural practices, or channelization because of urbanization. Most remaining riparian vegetation is afforded regulatory protection by CDFW. A discussion of specific regulations is provided in Section 3.5.2, "Regulatory Setting," below.

Within the urbanized portions of the Bay Area, riparian habitats, even though often degraded, support the densest and most diverse wildlife communities available. The diversity of plant species, multilayered vegetation, and perennial water provide a variety of foods and microhabitat conditions for wildlife. Mature willows, oaks, sycamores, and other riparian trees provide high-quality nesting habitat for the region's birds.

Special-Status Plants

Special-status riparian plants in the Bay Area include western leatherwood, Mason's lilaeopsis (*Lilaeopsis masonii*), Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), and Davidson's bush mallow (*Malacothamnus davidsonii*). See **Table C-1** in Appendix C for a complete list of special-status species with potential to occur in the plan area.

Special-Status Wildlife

Special-status birds that nest in Bay Area riparian corridors include yellow warbler (*Setophaga petechia*), yellow-breasted chat (*Icteria virens*), and long-eared owl (*Asio otus*). Habitat destruction, habitat fragmentation, and nest parasitism by the brown-headed cowbird (*Molothrus ater*) are suspected causes of the decline of some riparian bird species. Western red bat (*Lasiurus frantzii*), a California species of special concern, often roosts in tree foliage in riparian corridors. Riparian forest habitat also supports special-status mammals, including ringtail and mountain lion.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), federally listed as threatened, is dependent upon the elderberry bush (*Sambucus mexicana*) throughout its entire life history. Elderberry bushes occur statewide and commonly occur in riparian corridors but may also be present in isolated stands or in woodlands outside riparian habitats. The range of valley elderberry longhorn beetle includes portions of Solano County and eastern Contra Costa and Alameda counties.

Aquatic Habitat

Natural Community Summary

Rivers and Streams

Rivers and streams of the Bay Area have several common ecological attributes:

- As a result of urbanization, many smaller streams on the San Francisco Peninsula, in south San Francisco Bay, in the East Bay, and in portions of the North Bay have been channelized or otherwise developed for flood control or agriculture.
- Most of these waterways are small, seasonal streams, and in the case of urbanized streams, many maintain perennial flows from urban runoff sources during late summer months.
- There are a handful of native streams and rivers in each county that account for the majority of freshwater flows to San Francisco Bay and provide the greatest opportunities for special-status plants and wildlife species.

The Bay Area is drained by many small to midsized rivers and creeks spread throughout the region. The Sacramento–San Joaquin River Delta (Delta) contributes the majority of the freshwater input to San Francisco Bay; however, this discussion concentrates on other tributaries in the region that provide important riverine and aquatic habitat. In the North Bay, Petaluma River, Sonoma Creek, and Napa River account for much of the freshwater flows into San Pablo Bay. Relatively smaller, though biologically important, contributions are made by Gallinas Creek, Novato Creek, Corte Madera Creek, and Miller Creek in Marin County. In general, there are few impediments or obstructions in these creeks and their watersheds. These tributaries are less channelized, offering habitat for listed native salmonids, including coho salmon (*Oncorhynchus kisutch*) and steelhead (*Oncorhynchus mykiss irideus*). The Russian River in Sonoma County also provides good habitat for salmonids. Solano County watersheds, including the Putah Creek watershed, are also relatively undeveloped. Lake Berryessa limits the availability of headwater habitats in Putah Creek to anadromous fish, but this creek still provides valuable aquatic resources.

Stream resources in the East Bay, in the South Bay, and on the San Francisco Peninsula have been degraded by urban development, particularly adjacent to and within stream courses. As a result of these changes, only a handful of major streams in these areas support native fisheries and special-status fisheries. These include Alameda Creek, which drains the largely undeveloped watershed of the Sunol Valley and Livermore-Amador Valley; Coyote Creek, Guadalupe River, and Los Gatos Creek in the South Bay; and San Francisquito Creek, Permanente Creek, and San Mateo Creek on the San Francisco Peninsula. In Gilroy and Morgan Hill, Llagas Creek transports flows southward to the Pajaro River. Major dams or other fish impediments that prevent fish from reaching the upper watersheds are present in all of these streams, with the exception of San Francisquito Creek.

Habitat for common fish species occurs primarily in the streams listed in Section 3.10, “Hydrology and Water Quality,” although other, smaller streams in the Bay Area can and do support them.

Lacustrine

Lacustrine habitats are permanent water bodies that do not support emergent vegetation (except around their margins) and are not subject to tidal exchange; they include natural and constructed lakes and ponds, oxbows, flooded gravel pits, and flooded islands. Vegetation can include submerged plants, such as pondweeds (*Potamogeton* spp.) and algae in deepwater habitat, while near-shore habitat may support smartweeds (*Polygonum* spp.), cattails, spikerush (*Eleocharis* spp.), and other freshwater wetland vegetation. Lakes and ponds may support willow scrub along the shoreline. Bay Area reservoirs are typically stocked with game fish, including rainbow trout (*Oncorhynchus mykiss*), striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), sunfish (*Lepomis* spp.), brown bullhead

catfish (*Ameiurus nebulosus*), and channel catfish (*Ictalurus punctatus*), among others. Resident waterfowl using lacustrine habitat include a variety of ducks, such as mallard (*Anas platyrhinchos*), and American coot (*Fulica americana*), Canada goose (*Branta canadensis*), and wading birds, such as great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and great egret (*Ardea alba*).

Special-Status Plants

With the exception of several species, such as eel-grass pondweed (*Potamogeton zosteriformis*) and watershield (*Brasenia schreberi*), there are few special-status plants occurring in freshwater aquatic habitat of the region.

Special-Status Wildlife

As noted above, special-status fish occur in a limited number of rivers and streams in the Bay Area. Species include the federally listed tidewater goby (*Eucyclogobius newberryi*); coho salmon central California evolutionarily significant unit (ESU); steelhead northern California distinct population segment (DPS), central California coast DPS, and south/central California coast DPS; chinook salmon California coastal ESU (*Oncorhynchus tshawytscha*); green sturgeon (*Acipenser medirostris*), white sturgeon (*Acipenser transmontanus*), and Sacramento splittail (*Pogonichthys macrolepidotus*). Several species of limited distribution and rarity occur exclusively in the lower reaches of drainages near and within the Delta, such as longfin smelt (*Spirinichus thaleichthys*) and Delta smelt (*Hypomesus transpacificus*), which is State and federally listed as threatened.

Steelhead and coho spawning habitat is found in streams and rivers in less developed areas. Steelhead require higher-gradient, upper reaches of streams, with access to the ocean during emigration and spawning, and cool year-round water temperatures for the juveniles' rearing habitat. Steelhead populations are documented from San Francisquito Creek, Green Valley Creek, Suisun Creek, San Pablo Creek, Coyote Creek, Steven's Creek, Guadalupe River, Corte Madera, Miller Creek, Novato Creek, Sonoma Creek, Napa River, Huichica Creek, Petaluma River, San Lorenzo Creek, San Leandro Creek, and Alameda Creek, and they are known to sporadically migrate into and occasionally breed in smaller streams throughout the Bay Area.

California freshwater shrimp (*Syncaris pacifica*), federally listed as endangered, occurs in low-gradient, structurally diverse perennial streams in the northern Bay Area (USFWS 1998). Of the 17 streams that support this species, those in the Bay Area include Sonoma Creek, the Napa River, and Huichica Creek, which drain to San Pablo Bay, and Laguna de Santa Rosa (Santa Rosa Creek) and its tributaries, which drain to the Russian River. The 1998 Recovery Plan for this species addresses the long-term protection of aquatic and riparian habitat as criteria for species delisting.

Bridges of various rivers and streams provide nesting opportunities for birds protected under the federal Migratory Bird Treaty Act and the California Fish and Game Code (see Section 3.5.2, "Regulatory Setting," below), including barn swallow (*Hirundo rustica*) and cliff swallow (*Petrochelidon pyrrhonota*), and purple martin, a California species of special concern. Bat colonies may also roost under bridges in the Bay Area, including *Myotis* species, Mexican free-tailed bat (*Tadarida brasiliensis*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Breeding and nonbreeding bat roosts are protected by California Fish and Game Code Section 4150.

California red-legged frog, federally listed as threatened, breeds in the upper reaches of most Bay Area riparian corridors and in the lower reaches within select drainage systems and ponds. The greatest concentrations of this species in the Bay Area occur near Sears Point, in several drainages and channels that traverse Interstate 580 in the Livermore-Amador Valley, and in drainages on the San Francisco Peninsula, although potential and occupied habitat occurs elsewhere throughout the region. Foothill yellow-legged frog (*Rana boylii*) breeds within perennial cobble streams with pool habitat throughout the Bay Area.

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), federally and State listed as endangered, occurs on the San Francisco Peninsula, where riparian habitats meet open water and freshwater marshlands. Habitats within the peninsula corridor occur in marshlands near San Francisco International Airport and in tributary streams to the Crystal Springs Reservoir (near Interstate 280). Some riparian habitats in the Bay Area also support small populations of northwestern pond turtle (*Actinemys marmorata)*.

Special-status birds that use lacustrine habitat in the Bay Area include bald eagle (*Haliaeetus leucocephalus*), which is State listed as endangered and fully protected, and osprey (*Pandion halietus*), which is protected under Section 3503.5 of the California Fish and Game Code (see Section 3.5.2, "Regulatory Setting," below, for further details). Migratory waterfowl species that forage, overwinter, rear their brood, or otherwise rely on lacustrine habitat in the Bay Area at some time during the year include wood duck (*Aix sponsa*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), northern pintail (*Anas acuta*), green-winged teal (*Anas carolinensis*), canvasback (*Aythya valisineria*), bufflehead (*Bucephala albeola*), common goldeneye (*Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*), common merganser (*Mergus merganser americanus*), and ruddy duck (*Oxyura jamaicensis*). See **Table C-1** in Appendix C for a complete list of special-status species with potential to occur in the plan area.

San Francisco Bay Aquatic Resources

Natural Community Summary

The San Francisco Bay and Delta make up the Pacific Coast's largest estuary, encompassing roughly 1,600 square miles of waterways and draining more than 40% of California's fresh water. The outer coasts of Sonoma, Marin, San Francisco, and San Mateo Counties host diverse habitats, including sandy beaches, kelp forests, and rocky reefs. The Sacramento and San Joaquin rivers flow from northern California's inland valleys into the Delta's winding system of islands, sloughs, canals, and channels before emptying into San Francisco Bay and the Pacific Ocean. Major transportation corridors bridge the open waters of San Francisco Bay, and many others are located close to the bay.

The marine environment varies widely between the six transportation corridors that cross the open waters of the San Francisco Bay. Eelgrass (*Zostera marina*) may occur near the footings of bridges and is considered a sensitive habitat by CDFW. Eelgrass is an important habitat for many organisms and may influence benthic community structure by stabilizing sediments, providing forage and detritus food sources, and creating a refuge and nursery for small organisms. Eelgrass beds also provide an important attachment substrate for Pacific herring eggs and thus support an important Bay Area commercial fishery (USFWS 1984). As the largest estuary on the west coast, the San Francisco Bay also supports millions of birds that depend on the bay for rest and refueling on migratory routes.

More than 100 species of fish are described from the San Francisco Bay system (USFWS 1983). The majority of these are native species that live year-round in San Francisco Bay, though a few, such as striped bass (*Morone saxatilis*), have been introduced. Anadromous fish also use San Francisco Bay seasonally during their migrations to and from spawning grounds throughout the Bay Area and in California's Central Valley. The species composition within the bay varies by season and changes to reflect the regularly changing physical conditions created by the freshwater flow from the San Joaquin and Sacramento rivers and other tributaries into San Francisco Bay. Native fish commonly found within the bay include such diverse species as starry flounder (*Platichthys stellatus*), California halibut (*Paralichthys californicus*), leopard shark (*Triakis semifasciata*), tule perch (*Hysterocarpus traski*), Pacific herring (*Clupea harengus pallasi*), northern anchovy (*Engraulis mordax*), sturgeons (*Acipenser* spp.), steelhead, and Chinook salmon (Central Valley spring-run and Sacramento River winter-run ESUs).Nonnative fish species in the bay include largemouth bass, threadfin shad (*Dorosoma petenense*), and yellowfin goby (*Acanthogobius flavimanus*).

The benthic invertebrate community of the bay is composed of various annelids, mysid shrimp, copepods, amphipods, shrimp, crabs, and other macroinvertebrates. All of these organisms provide important food sources for estuary fish and bird species.

Riprap occurs along many areas of the bay shore and can provide some, but not all, of the habitat values and functions that naturally occurring rocky shore habitat would provide, including a substrate for marine plant and sessile intertidal organisms, such as mussels (*Mytilus* spp.) and barnacles. Rocky shore habitat also provides cover for invertebrates such as rock crabs (*Cancer antennarius* and *Cancer productus*) and for fish such as plainfin midshipmen (*Porichthys notatus*), which are known to seek cover and to spawn under concrete slabs. The marine plants, clams, mussels, barnacles, annelids, and crustaceans inhabiting rocky shore habitat are food sources for larger marine invertebrates, fishes, birds, and marine mammals.

The marine environment associated with San Francisco Bay also sustains important commercial and recreational fisheries, such as Dungeness crab (*Cancer magister*), Pacific herring, rockfish (*Sebastes* spp.), California halibut, surfperches (Embiotocidae), and California grunion (*Leuresthes tenuis*).

Special-Status Wildlife

The two marine mammals most commonly found in San Francisco Bay are California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*). Both species forage in the open waters of the bay and bask on exposed rocks, piers, or wharves throughout the bay. The Marine Mammal Protection Act protects both species.

NOAA Fisheries recognizes several threatened and endangered species that occur in San Francisco Bay. These include loggerhead sea turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), olive ridley sea turtle (*Lepidochelys olivacea*), and several fish species, including coho salmon, steelhead, Delta smelt, tidewater goby, and Sacramento splittail. The goby, smelt, and splittail are resident species; the salmonids, however, are expected to use open water habitats of the bay only seasonally or infrequently. Although California brown pelican (*Pelecanus occidentalis californicus*) and Steller sea lion (*Eumetopias jubatus*) are now delisted, brown pelican is still protected under the Migratory Bird Treaty Act, and Steller sea lion is still protected under the Marine Mammal Protection Act.

Wetlands

Natural Community Summary

Coastal Marsh and Estuaries

Coastal salt marshes around San Francisco Bay (including historically diked tidal marshes) are dominated by perennial pickleweed (*Salicornia pacifica*), alkali heath (*Frankenia salina*), spearscale (*Atriplex triangularis*), marsh gumplant (*Grindelia stricta* var. *angustifolia*), saltgrass (*Distichlis spicata*), and other salt-tolerant plants that are also tolerant of regular inundation or soil saturation. Tidal salt marshes are typically bisected by a network of sloughs and small channels that facilitate tidal reach into the interior of the marsh. These channels are subject to more frequent and deeper flooding and therefore support different plant species, such as smooth cordgrass (*Spartina foliosa*) and alkali bulrush (*Scirpus maritimus*). As tidal effects and salinity decrease, coastal salt marsh intergrades with brackish marsh, especially in areas where larger rivers meet the bay.

In more extensive slough systems, such as those in the North Bay and South Bay, the transition zones between sloughs and creeks are increasingly dominated by species adapted to brackish and fresh water, such as California bulrush (*Scirpus californicus*) and cattails. Extensive coastal marsh communities are present in the lower reaches of Sonoma Creek and the Napa River and in patches along US 101 in Palo Alto and Mountain View.

There are relatively few terrestrial animals in the salt marsh; however, the nonnative red fox (*Vulpes vulpes*) and house mouse (*Mus musculus*), as well as the native California vole and black- tailed jackrabbit can be found in marshes around the bay. Resident bird species include marsh wren (*Cistothorus palustris*), and raptors typical of Bay Area salt marsh habitats include northern harrier, red-tailed hawk, and American kestrel. Migratory shorebirds that forage in the mudflats during low tide include black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), and several sandpipers. During high tide, a few of the ducks that may be found in salt marsh environments include northern shoveler, American wigeon, northern pintail, gadwall (*Anas strepera*), and canvasback.

Freshwater Wetlands

Freshwater emergent wetlands, or marshes, occur along slow-moving streams and rivers, along lakeshores, and in stockponds and other artificial water bodies and are dominated by perennial vegetation, such as cattails, bulrush, or spikerush. Freshwater marsh habitat provides nesting and foraging opportunities, as well as cover, for a number of bird species, amphibians, and small mammals. Species commonly associated with freshwater emergent wetlands include great blue heron, great egret, black phoebe (*Sayornis nigricans*), red-winged blackbird (*Agelaius phoeniceus*), raccoon, Sierran treefrog (*Pseudacris sierra*), and California vole. Larger mammals may use these wetlands for water or forage.

Freshwater seeps and wet meadows occur on permanently moist soil and are dominated by perennial grasses, sedges (*Carex* spp.), and rushes (*Juncus* spp.). In the Bay Area, these wetlands typically occur on grazed hillsides or at the base of grassland slopes. Seasonal wetland habitat consists of vernal pools, alkali marshes, alkali sink scrub habitats, and other seasonal wetlands with intermittent hydrologic conditions. Seasonal wetlands are dominated by herbaceous vegetation and pond surface water or maintain saturated soils at the ground surface for enough of the year to support facultative or obligate wetland plant species.

Vernal pools are seasonal freshwater pools that form in depressions over an impermeable soil layer (claypan or hardpan) or parent material. The vegetation in vernal pools consists primarily of annuals with low cover and a short life cycle. Vernal pools support a distinctive flora with a high number of endemic and rare species. Ephemeral seasonal wetlands habitat that supports vernal pool species occurs in the eastern Livermore-Amador Valley, Solano County, the city of Fremont, and the Brentwood area; near the Napa County Airport; and in the Santa Rosa Plain. In addition, alkali meadows and seeps in Contra Costa County support a similar assemblage of vernal pool endemic species.

Special-Status Plants

Special-status plants found in Bay Area salt marshes include Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*), soft bird's beak (*Chloropyron molle* ssp. *molle*), Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*), and California seablite (*Suaeda californica*). Rare plants in brackish marshes include Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), and Suisun marsh aster.

Special-status plants of seasonal wetlands and vernal pools include Solano grass (*Tuctoria mucronata*), vernal pool smallscale (*Atriplex persistens*), Jepson's coyote thistle (*Eryngium jepsonii*), Santa Lucia dwarf rush (*Juncus luciensis*), San Joaquin saltbush (*Atriplex joaquiniana*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), Contra Costa goldfields, alkali-sink goldfields (*Lasthenia chrysantha*), Point Reyes meadowfoam (*Limnanthes douglasii* ssp. *sulphurea*), and alkali milk vetch (*Astragalus tener* var. *tener*). Several highly endangered species occur in vernal pools of the Santa Rosa Plain, including Burke's goldfields (*Lasthenia burkei*), Sebastopol meadowfoam (*Limnanthes vinculans*), and Sonoma sunshine (*Blennosperma bakeri*), which are all listed as federal and State endangered species.

Special-Status Wildlife

Rare and endangered wildlife species that occur in tidal marshes of the Bay Area include California Ridgway's rail (*Rallus obsoletus obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), western snowy plover (*Charadrius alexandrinus nivosus*), Alameda song sparrow (*Melospiza melodia pusillula*), San Pablo song sparrow (*Melospiza melodia samuelis*), salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), salt marsh harvest mouse (*Reithrodontomys raviventris*), San Pablo vole (*Microtus californicus sanpabloensis*), Suisun shrew (*Sorex ornatus sinuosus*), and salt marsh wandering shrew (*Sorex vagrans*). The wetland-upland transition zone associated with tidal marshes (i.e., areas where the wetlands and uplands meet which contain vegetation types from both habitats) often provide habitat (e.g., refuge, foraging) for these wildlife species.

Freshwater emergent wetlands and adjacent grassland habitats in Solano County support populations of giant garter snake (*Thamnophis gigas*), federally and State listed as threatened. Freshwater emergent wetlands throughout the region support California red-legged frog, and vernal pools and other seasonal wetlands of sufficient depth and duration of inundation support California tiger salamander in the Santa Rosa Plain, East Bay, and elsewhere. Special-status invertebrates found in seasonal wetlands and vernal pools, primarily in the East Bay and Solano County, include longhorn fairy shrimp (*Branchinecta longiantenna),* vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*).

Jurisdictional Waters

As described in detail in Section 3.5.2, "Regulatory Setting," below, activities such as discharge of fill or alteration that would affect most streams, rivers, and wetlands in the Bay Area are regulated by the US Army Corps of Engineers (USACE), the San Francisco Regional Water Quality Control Board (RWQCB), and CDFW. The Bay Conservation and Development Commission (BCDC) regulates activities in and adjacent to San Francisco Bay, and the California Coastal Commission regulates activities along the California coast.

Jurisdictional wetlands in the Bay Area include tidal, brackish, and freshwater marshes; seasonal wetlands; seeps; and vernal pools. Rivers and streams are considered "other waters" and are regulated as such by the wetland permitting agencies. Compliance with regulations concerning wetlands and other waters would be required on a project-level basis under the proposed plan.

Urban/Agricultural/Ruderal

Natural Community Summary

Urban

Urban development and landscaped areas support few biological resources and provide limited wildlife habitat but do provide foraging or nesting habitat for generalist,[4] and sometimes nonnative, wildlife species that can tolerate human presence and activities. These include birds and small mammals such as California scrub jay, California towhee, house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), raccoon, Virginia opossum (*Didelphis virginica*), and house mouse. Although these areas often do not provide habitat suitable for many specialized species of native wildlife because of higher human activity levels and the resources available, they may support a greater diversity of native wildlife species under appropriate conditions. For example, urban areas adjacent to natural habitat areas may be used as low-quality wildlife movement corridors as wildlife species move between these natural habitat areas, especially if urban areas contain open space features.

[4] "Generalist" species can occupy and thrive in a variety of natural or developed areas.

Agricultural

The Bay Area supports agricultural lands farmed for feed and grain, produce, orchards, vineyards, and other crops, such as commercial nurseries. Agricultural lands do not typically provide habitat for a wide variety of species but when situated in proximity to undeveloped open space, rivers, and marshes may attract many of the wildlife species associated with these habitats to forage in croplands. Common species occurring in agricultural lands include small mammals, such as voles and mice, and birds, such as mourning doves, European starlings (*Sturnus vulgaris*), and several blackbird species. Special-status species commonly associated with agricultural lands include giant garter snake and burrowing owl. Croplands are also important foraging habitats for numerous raptors, including red-tailed hawk, northern harrier, and white-tailed kite.

Ruderal

Ruderal (disturbed and weedy) habitats are most prevalent in areas subject to frequent and often severe vegetation and soil disturbances, including overgrazed rangeland, disced or fallow fields, construction sites, levees, automobile parking lots, and railroad or other public utility rights-of-way. This habitat type occurs throughout the region and is replacing annual grasslands where pressures are particularly high. Where vegetated, these sites are dominated by opportunistic, weedy nonnative plant species, such as perennial pepperweed, black mustard (*Brassica nigra*), mayweed (*Anthemis cotula*), wild radish (*Raphanus sativus*), yellow star-thistle, Italian thistle (*Carduus pycnocephalus*), fennel, poison hemlock, pampas grass (*Cordateria jubata*), and bristly ox-tongue (*Helminthotheca echioides*).

Ruderal habitats provide limited foraging or nesting habitat for disturbance-tolerant and nonnative birds and small mammals, such as house sparrow, European starling, house finch, mourning dove, golden-crowned sparrow (*Zonotrichia atricapilla*), Norway rat (*Rattus norvegicus*), house mouse, California ground squirrel (*Otospermophilus beechyi*), and other rodents. Killdeer (*Charadrius vociferous*) commonly forage and nest on gravel or bare ground, including open dirt and fractured pavement. Ruderal habitat can also provide refuge for reptiles, such as western fence lizard*,* alligator lizard (*Elgaria multicarinata)*, and gopher snake.

Special-Status Plants

Special-status plants are not expected to regularly occur in urban, agricultural, or ruderal environments because of the degree of disturbance to soils and vegetation, as well as habitat fragmentation, found in these areas. However, although these plants are not expected to regularly occur, they can occasionally be found within these areas.

Special-Status Wildlife

In general, most special-status wildlife species are not expected to occur in urban or other highly disturbed areas. The exception to this would be bats and birds. For example, bats could use underutilized or abandoned buildings in urban areas for roosting, and raptors such as Cooper's hawk and red-tailed hawk are known to nest with regularity in urban areas as well. Bats and raptors are also known to forage in agricultural fields. Burrowing owls sometimes nests within agricultural areas and in ruderal grasslands adjacent to urban development.

MIGRATORY CORRIDORS AND LINKAGES

The Bay Area encompasses large areas of wildlands that provide habitat for both common and rare plants and wildlife. The Conservation Lands Network (CLN) has been established as a conservation strategy with a set of goals and scientifically based decision making tools that support strategic investments in land protection and stewardship. The CLN focuses on biodiversity and local migratory conditions previously unavailable in the San Francisco Bay Area and identifies the most essential lands needed to sustain biological diversity. Included in this effort was modeling to identify vital wildlife corridors (i.e., critical linkages) in the nine Bay Area counties plus Santa Cruz, San Benito, Monterey Mendocino, and Lake counties. The results provide a detailed analysis of areas where maintenance or restoration of ecological connectivity is essential to conserving biological diversity and wildlife crossings and corridors. The results of this critical linkage modeling in the plan area, (i.e., riparian buffer zone, important baylands, linkage design, large landscape blocks) are shown in **Figure 3.5-5**. These linkages are not regulatory delineations but are identified as lands likely important to wildlife movement between large, mostly natural areas at the statewide level. As seen in this figure, critical linkages occur within all nine Bay Area counties and are typically centered along the region's mountain ranges. These areas are composed primarily of wildlands but may also include some agricultural and developed areas (mostly rural residential) and many are bisected by major roadways.

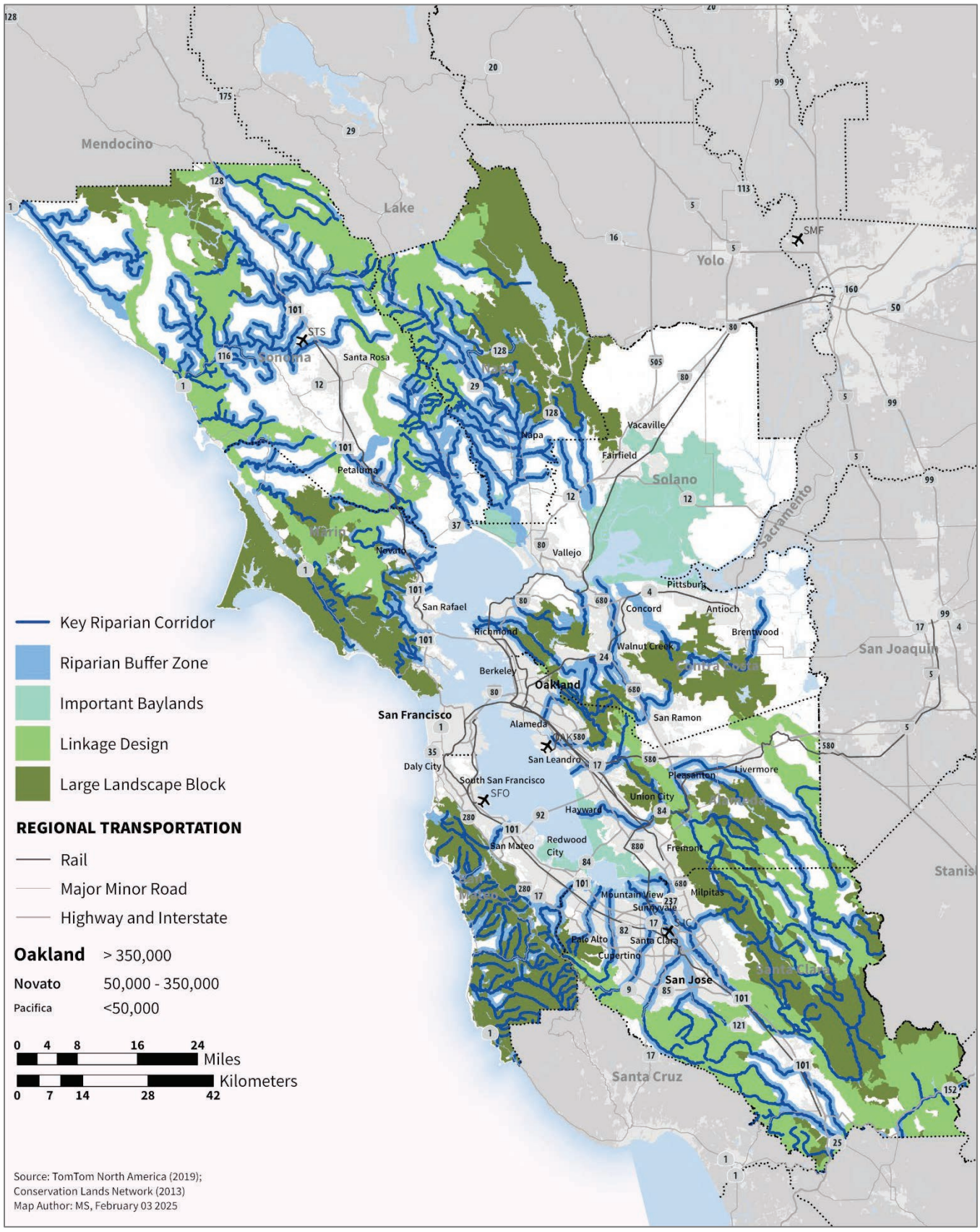
PRIORITY CONSERVATION AREAS

Priority Conservation Areas (PCAs) are regionally significant areas to be protected and improved. PCAs include natural habitats, farms and ranchlands, recreation areas, urban green spaces, and locations that can help fight the effects of climate change. PCAs are nominated by local jurisdictions with land use authority (such as open space districts, city and county parks and recreation departments, and other local entities) and adopted by the Association of Bay Area Governments (ABAG). Designation of a PCA does not change the local land use designation, zoning or the ability for the property to be developed in the future

MTC and ABAG were awarded a grant from the Sustainable Agricultural Lands and Conservation (SALC) Program managed by the California Department of Conservation to support a refresh of the PCA planning framework. The refresh effort kicked off in June 2022 and concluded in May 2024 with preparation and adoption of a PCA Final Report (MTC and ABAG 2024). The PCA Final Report synthesized the strengths and weaknesses of the prior planning framework and includes an updated vision, goals and objectives for PCAs, as well as corresponding eligibility maps to bring greater structure to the framework. It identified recommendations to improve the effectiveness of the region's conservation planning framework, and incorporated a wider range of policy concerns, such as equity and resilience to climate hazards.

Draft PCA mapping that resulted from the planning framework refresh effort is available on an online mapper on MTC's website:
https://experience.arcgis.com/experience/2175517734ea426eb3f5940a4e30bd6f/.

Figure 3.5-5: Essential Connectivity Areas



3.5.2 Regulatory Setting

The regulations and policies of various federal and State agencies (e.g., USACE, US Environmental Protection Agency [EPA], USFWS, CDFW) mandate protection of wetlands, some special-status plant and wildlife species, and aquatic and terrestrial communities in the region. USACE has primary federal responsibility for administering regulations that concern waters and wetlands, while USFWS, NOAA Fisheries, and CDFW have lead responsibility for determining potential project effects on federally listed and State-listed species and other species of concern.

FEDERAL REGULATIONS

National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) was one of the first laws to establish a broad national framework for protecting the environment. Its purposes include "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment; [and] to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." NEPA ensures that all branches of government consider the environment before undertaking major federal actions that could significantly affect the environment.

Environmental assessments and environmental impact statements, which assess the likelihood of impacts from alternative courses of action, are required from all federal agencies and are the most visible NEPA requirements. The documents must include discussion of the environmental impacts of the alternatives, including the proposed action; any adverse environmental effects that cannot be avoided if the proposal is implemented; the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitments of resources that would be involved in the proposal if it is implemented.

Federal Endangered Species Act

Under ESA, the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region and whether the proposed project would result in a "take"[5] of such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3][4]). Project-related impacts on these species or their habitats would be considered significant in this EIR. The "take" prohibition of ESA applies to any action that would adversely affect a single member of an endangered or threatened species. Similarly, the act provides for the designation of "critical habitat" when prudent and determinable.

Section 10 of ESA applies if a nonfederal agency is the lead agency for an action that results in take and no other federal agencies are involved in permitting the action. Section 7 of ESA applies if a federal

[5] "Take," as defined in Section 9 of ESA, is broadly defined to include intentional or accidental "harassment" or "harm" to wildlife. "Harass" is further defined by the US Fish and Wildlife Service as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, and sheltering. "Harm" is defined as an act that actually kills or injures wildlife. It may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. There is currently a proposed rule (Federal Register Vol. 90 No. 73, USFWS 2025) to rescind the definition of "harm" from ESA's "take" definition; however, a final rule has not been published.

discretionary action is required (e.g., a federal agency must issue a permit), in which case the involved federal agency consults with USFWS and NOAA Fisheries.

Marine Mammal Protection Act

The Marine Mammal Protection Act (50 CFR 216) prohibits, with certain exceptions, the take of marine mammals in US waters and by US citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. This act defines "take" as hunting, harassing, capturing, or killing any marine mammal or attempting to do so. "Harassment" is defined as any act of "pursuit, torment, or annoyance" that has the potential to injure a marine mammal or cause disruption of essential behavioral patterns, including feeding, sheltering, migration, breeding, nursing, or breathing. The majority of the act's provisions are related to commercial fishing and subsistence hunting. The act also outlines procedures for obtaining permits for take of small numbers of marine mammals, incidental to otherwise legal activities. Under this act, NOAA Fisheries has regulatory authority for the protection of sea lions, seals, dolphins, porpoises, and whales, and USFWS has authority regarding sea otters, walrus, manatees, and polar bears.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. The current list of species protected by MBTA can be found in Title 50 of CFR, Section 10.13 (50 CFR 10.13). The list includes nearly all birds native to the United States.

The Bald and Golden Eagle Protection Act prohibits persons within the United States (or other places subject to US jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest or egg thereof." This act also prohibits "taking" of bald and golden eagles, with "take" defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Disturbance includes causing direct injury, a decrease in productivity, or nest abandonment.

Clean Water Act

The Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. Although the purpose of the act is primarily to maintain water quality for both human and environmental benefits, regulations developed pursuant to this act deal extensively with permitting for actions in wetlands. These regulations provide more specific protection for wetland habitats—most of which are important ecologically—than any other laws. EPA has primary authority under the CWA to set standards for water quality and for effluents, but USACE has responsibility for permitting dredge and fill in wetlands.

Section 404 of the CWA requires project proponents to obtain a permit from USACE before performing any activity that involves any discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, tidally influenced waters, and all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Many surface waters and wetlands in California meet the criteria for waters of the United States. Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Potentially jurisdictional wetlands must meet three wetland delineation criteria: hydrophytic vegetation, hydric soil types, and wetland hydrology. Wetlands that meet the delineation criteria may be jurisdictional under Section 404 of the CWA pending USACE verification.

In accordance with Section 401 of the CWA, projects that apply for a USACE permit for discharge of dredged or fill material must obtain water quality certification from the appropriate RWQCB indicating that the action would uphold State water quality standards.

Marine Protection, Research, and Sanctuaries Act of 1972

This legislation allowed for establishment of marine sanctuaries, such as the Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries off the coast of Marin and Sonoma counties and the San Francisco Peninsula, respectively. This act provides increased protection from a variety of human influences on the marine resources within the sanctuaries. Among their important uses, the national marine sanctuaries provide an essential fishery, recreational opportunities, and habitat for a myriad of rare and common shorebirds, marine mammals, and other wildlife. Section 103 of this act regulates the transportation of dredged materials in ocean waters. This act is implemented through a permit granted by USACE, which uses EPA's ocean disposal criteria to regulate the disposal of dredged materials.

Magnuson-Stevens Fishery Management and Conservation Act

The Magnuson-Stevens Fishery Management and Conservation Act (Magnuson-Stevens Act) (16 USC Section 1801 et seq.) is the primary law governing management of commercial and recreational marine fisheries in the United States. The purpose of this federal law is sevenfold: conserve fishery resources, support enforcement of international fishing agreements, promote fishing in line with conservation principles, provide for the implementation of fishery management plans to achieve optimal yield, establish regional fishery management councils to steward fishery resources, develop underutilized fisheries, and protect essential fish habitat (EFH).

The Magnuson-Stevens Act requires federal agencies to consult with NOAA Fisheries when a project has the potential to adversely affect EFH. State agencies are not required to consult with NOAA Fisheries; however, NOAA Fisheries is required to develop EFH conservation recommendations for any State agency activity that would affect EFH. Similar in concept to Critical Habitat in ESA, EFH protection measures recommended by NOAA Fisheries or a regional fisheries management council are advisory and not prescriptive.

Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. Under this act, USACE must authorize any excavation or deposition of materials into such waters or any work that could affect the course, location, condition, or capacity of such waters.

Coastal Zone Management Act of 1972

This act established the authority for creating coastal zone management areas and the California Coastal Commission. Coastal zone management criteria are established by the commission and must be followed by federal, other government, or private entities performing any activities within the coastal zone.

US Department of Transportation Act, Section 4(F)

Per Section 4(f) of the US Department of Transportation Act (49 US Code Section 303), the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned and accessible parks, recreation areas, and wildlife and waterfowl refuges of national, State, or local significance or land from historic sites of national, State or local significance as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use.

STATE REGULATIONS

California Endangered Species Act

Under CESA, CDFW has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code Section 2070). CDFW also maintains a list of "candidate species," which are species formally noticed as being under review for addition to either the list of endangered species or the list of threatened species. In addition, CDFW maintains lists of "species of special concern," which serve as "watch lists." Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any species State listed as endangered or threatened could be present on the project site and determine whether the proposed project could have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed project that may affect a candidate species. Project-related impacts on species on the CESA endangered or threatened lists would be considered significant in this EIR. Impacts on "species of concern" would be considered significant under certain circumstances, discussed below.

California Fish and Game Code

Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and generally do not provide for authorization of incidental take unless the species is covered and conserved in a NCCP or the project activities qualify for incidental take permitting under Section 2081.15 of the California Fish and Game Code. CDFW has informed nonfederal agencies and private parties that their actions must avoid take of any fully protected species.

Sections 3503 and 3503.5—Protection of Bird Nests and Raptors

Section 3503 of the Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 of the California Fish and Game Code states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the order Falconiformes or Strigiformes), including their nests or eggs. Typical violations include destruction of active nests as a result of tree removal or disturbance caused by project construction or other activities that cause the adults to abandon the nest, resulting in loss of eggs and/or young.

Section 4150—Protection of Nongame Mammals

Section 4150 states that all mammals occurring naturally in California that are not game mammals, fully protected mammals, or fur-bearing mammals are "nongame mammals." Nongame mammals or parts thereof may not be taken or possessed except as provided in the code or in accordance with regulations adopted by the California Fish and Game Commission. Nongame mammals that may be taken or possessed are primarily those that cause crop damage.

Section 1602—Lake and Streambed Alteration

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports fish or wildlife resources are subject to regulation by CDFW under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do any of the following without first notifying CDFW:

- substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

CDFW jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A streambed alteration agreement must be obtained for any diversion or alteration that would substantially adversely affect a fish or wildlife resource in a river, stream, or lake.

Section 1360–1372—Oak Woodlands Conservation Act and California

The California Oak Woodlands Conservation Act (Fish and Game Code sections 1360–1372) was enacted to protect oak woodland habitats that were being diminished by development, firewood harvesting, and agricultural conversions. The Oak Woodlands Conservation Program was established as a result of the act and is intended to provide project funding opportunities for private landowners, conservation organizations, and cities and counties to conserve and restore oak woodlands. The program authorizes the Wildlife Conservation Board to purchase oak woodland conservation easements and provide grants for land improvements and oak restoration efforts.

Section 21083.4 of CEQA requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.

Natural Community Conservation Planning Act

An NCCP is a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity that began under the State's Natural Community Conservation Planning Act (Fish and Game Code Section 2800), legislation broader in its orientation and objectives than ESA and CESA. An NCCP identifies and provides for the regional or areawide protection of plants, animals, and their habitats while allowing compatible and appropriate economic activity. The primary objective of the NCCP program is to conserve natural communities at the ecosystem level while accommodating compatible land use. The program is intended to anticipate and prevent the controversies and gridlock caused by species' listings by focusing on the long-term stability of wildlife and plant communities and including key interests in the process. Like regional habitat conservation plans (HCPs), NCCPs can allow for take of listed species while promoting overall conservation of the species through landscape-level protections. In 2011, SB 618 authorized CDFW to permit the incidental take of fully protected species if the species is covered and conserved in an NCCP.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, waters of the State fall under the jurisdiction of the appropriate RWQCB. The RWQCB must prepare and periodically update water quality control plans (basin plans). Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control point and nonpoint sources of pollution to achieve and maintain these standards. The RWQCB's jurisdiction includes federally protected waters, as well as areas that meet the definition of "waters of the State." Waters of the State are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. In addition to water quality certifications under Section 401 of the federal CWA, discharges to waters of the State, including wetlands, must meet the RWQCB waste discharge requirements. The State Water Resources Control Board published a new set of procedures for discharges of dredged or fill material into waters of the State on March 22, 2019. Where mitigation is required for dredging and fill, no net loss of wetlands functions and values of waters of the State typically is required by the RWQCB.

Delta Conveyance (Formerly California WaterFix and Bay Delta Conservation Plan)

In May 2019, the California Department of Water Resources (DWR) took formal action to rescind State and federal permit applications for the California WaterFix project. In December of 2022, USACE released the draft Environmental Impact Statement for the Delta Conveyance Project, which is a single tunnel project to modernize State Water Project infrastructure in the Delta. In December of 2023, DWR approved the project and certified the EIR for the project. DWR expects permitting to be complete in late-2026.

Sacramento-San Joaquin Delta Reform Act of 2009

In November 2009, the California Legislature enacted the Sacramento-San Joaquin Delta Reform Act (Delta Reform Act) (California Water Code Section 10610 et seq.), also known as Senate Bill (SB) 1 (Stats. 2009, 7th Ex. Sess., ch. 5) (SB X7-1), one of several bills passed at that time related to water supply reliability, ecosystem health, and the Delta. The Delta Reform Act created the Delta Stewardship Council (DSC), charged with developing and adopting the Delta Plan. The Delta Plan is a comprehensive, long-term management plan for the Delta that creates new rules and recommendations to further the State's coequal goals for the Delta: Improve statewide water supply reliability and protect and restore a vibrant and healthy Delta ecosystem, all in a manner that preserves, protects, and enhances the unique agricultural, cultural, and recreational characteristics of the Delta. The Delta Plan was unanimously adopted by DSC on May 16, 2013, and became effective with legally enforceable regulations on September 1, 2013. The following regulatory policies and recommendations are applicable to biological resources:

- Complete Bay Delta Conservation Plan (Recommendation WR R12).
- Restore Habitats at Appropriate Elevations (23 CCR Section 5006).
- Protect Opportunities to Restore Habitat (23 CCR Section 5007).
- Expand Floodplains and Riparian Habitats in Levee Projects (23 CCR Section 5008).
- Prioritize and Implement Projects That Restore Delta Habitat (Recommendation ER R2).
- Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species (23 CCR Section 5009).
- Prioritize and Implement Actions to Control Nonnative Invasive Species (Recommendation ER R7).

The Delta Plan was amended in February 2016 to include refined performance measures, which were again amended in April 2018. A September 2016 amendment made permanent an exemption for single-year water transfers to be considered as covered actions. Also, in April 2018, the Delta Plan was amended to revise Chapter 3 to include new text and recommendations for conveyance, storage, and operations, and to revise Chapter 7 to include new text and policy for setting priorities for State investments in Delta levees.

Under the Delta Reform Act, DSC is charged with reviewing and advising local and regional agencies regarding the consistency of local and regional planning documents, including the proposed plan, with the Delta Plan. DSC's input includes reviewing the consistency of local and regional plans with the ecosystem restoration needs of the Delta and whether the lands set aside for natural resource protection are sufficient to meet the Delta's ecosystem needs. The Delta Reform Act requires that "covered actions," as defined, which include plans, programs, or projects within the primary or secondary zones of the Delta, be consistent with the Delta Plan.

The Delta Reform Act expressly provides that "covered actions" do not include (1) regional transportation plans, such as the proposed plan, and (2) plans, programs, projects, activities (and any infrastructure necessary to support those plans, programs, projects, or activities) within the secondary zone of the Delta that has been determined to be consistent with the proposed plan (California Water Code Section 85057.5). However, DSC reviews any plan that includes land within the Delta zones, whether or not it is a covered action. Metropolitan planning organizations that have a planning area crossing these boundaries are required to follow a consultation procedure with DSC. This procedure includes early coordination to determine consistency of a proposed plan with the Delta Plan. MTC and ABAG consulted with DSC on December 12, 2019, and January 22, 2020, on the application of the law, the geography under DSC authority, and the policies established by the DSC, and will follow the Delta Reform Act's consultation requirements.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed CDFW to carry out the legislature's intent to "preserve, protect, and enhance

endangered plants in this state." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. CESA expanded upon the original NPPA and enhanced legal protection for plants. CESA established threatened and endangered species categories and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. The act prohibits take of endangered or rare native plants but includes exceptions for agricultural and nursery operations; for emergencies; and, after proper notification to CDFW, for vegetation removal from canals, roads, and other building sites; changes in land use; and other situations.

California Coastal Act

The California Legislature enacted the California Coastal Act in 1976 to regulate coastal development throughout the State. The act created a "coastal management zone" that generally extends 3 miles seaward and up to 5 miles inland from the mean high tide line. In particularly important and generally undeveloped areas where there can be considerable impact on the coastline from inland development, the coastal zone may extend to a maximum allowable limit. In developed urban areas, the coastal zone generally extends inland for a much shorter distance. Each city or county government whose jurisdiction includes land in the coastal zone must develop a Local Coastal Program for the area. The Local Coastal Program guides planning, conservation, and use of coastal resources; must be consistent with the Coastal Act; and must be certified by the California Coastal Commission. Any person wishing to develop land within the coastal zone must obtain a permit from the relevant city or county, and the development plan must be consistent with the policies of the act.

Z'berg-Nejedly Forest Practice Act

The Z'berg-Nejedly Forest Practice Act (FPA) ensures that logging on privately owned lands in California is done in a manner that will preserve and protect fish, wildlife, forests, and streams. This act established a nine-member State Board of Forestry whose mandate was the control over forest practices and forest resources in California. The Board of Forestry sets forest management policies that are implemented by the California Department of Forestry and Fire Protection (CAL FIRE).

The FPA requires that a Timber Harvest Plan (THP) be prepared by a Registered Professional Forester (RPF) for timber harvest on virtually all nonfederal land. THPs are submitted to CAL FIRE for its review and approval. The THP process is the functional equivalent of an EIR under CEQA.

California Forest Practice Rules

Additional rules enacted by the State Board of Forestry are also enforced to protect fish, wildlife, forests, and stream resources. The purpose of the Forest Practice Rules is to implement the provisions of the FPA in a manner consistent with other laws, including but not limited to, the Timberland Productivity Act of 1982, CEQA, the Porter-Cologne Water Quality Control Act, and CESA. The provisions of the rules are followed by RPFs in preparing THPs, and by the CAL FIRE director in reviewing such plans to achieve the FPA policies. CAL FIRE ensures that private landowners abide by these laws when harvesting trees. Although there are specific exemptions in some cases, compliance with the FPA and Board rules apply to all commercial harvesting operations for landowners of small parcels, ranchers owning hundreds of acres, and large timber companies with thousands of acres.

A THP that does not comply with all forestry and environmental regulations is returned to the RPF. It is approved only after the RPF and landowner agree to make the changes necessary to ensure compliance with all laws. CAL FIRE follows up on approved THPs with site inspections and can shut down operations and cite or fine RPFs, Licensed Timber Operators, and landowners if illegal operations are found.

California Wildlife Action Plan 2015

CDFW developed the State Wildlife Action Plan, 2015 Update (also known as "SWAP 2015") as a comprehensive plan for conserving California's fish and wildlife and their vital natural habitats for future generations. SWAP 2015 establishes a strategic vision of the integrated conservation efforts needed to sustain the tremendous biodiversity of fish and wildlife resources found in the State. Significant climate-related changes to California's environment have been documented in the last decade, including sea level rise, natural community shifts, increased prevalence of invasive species, increased number and intensity of wildfires, and prolonged drought. SWAP 2015 has considered these climate-induced effects, as well as other pressures on wildlife populations and habitats, and identifies statewide and regional conservation strategies to protect the State's natural resources.

Employing an ecosystem approach to conserve and manage diverse habitats and species, SWAP 2015 provides a blueprint for actions necessary to address the highest priorities for conserving California's aquatic, marine, and terrestrial resources. Its implementation relies on making important and helpful conservation information more accessible to resource managers and the public, and on developing lasting partnerships with a broad array of governments, agencies, organizations, businesses, and citizens. SWAP 2015 describes key conservation factors crucial to the sustainability of California ecosystems, and for each geographic province, it provides specific conservation strategies that will reduce or ameliorate adverse impacts on ecological systems or enhance the quality vital to the natural landscapes of California.

REGIONAL AND LOCAL REGULATIONS

Habitat Conservation Plans

East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

The *East Contra Costa County HCP/NCCP* (2006), overseen by the East Contra Costa County Habitat Conservancy, covers the eastern one-third of Contra Costa County (174,018 acres). It allows Contra Costa County, the Contra Costa County Flood Control and Water District, the East Bay Regional Park District, and the cities of Brentwood, Clayton, Oakley, and Pittsburg to streamline environmental permitting for activities and projects in the region that are covered by the HCP. The HCP also provides for comprehensive species, wetlands, and ecosystem conservation, and contributes to the recovery of endangered species in California while allowing for limited take of 28 listed and nonlisted ("covered") species. By implementing the HCP, the above-mentioned signatories will have a 30-year permit from USFWS and CDFW that authorizes take of covered species and will avoid project-by-project permitting that is generally costly and time consuming.

Santa Clara Valley Habitat Plan

The City of San José, Santa Clara County, the Santa Clara Valley Transportation Authority, the Santa Clara Valley Water District, the City of Gilroy, and the City of Morgan Hill initiated a collaborative process to prepare and implement an HCP/NCCP for the Santa Clara Valley. The final HCP/NCCP, called the *Santa Clara Valley Habitat Plan*, and associated EIR were released in 2012. In 2013, the HCP/NCCP was adopted by all local participating agencies, and permits were issued from USFWS and CDFW. The HCP/NCCP targets specific areas of the county where land development activities and the continued survival of endangered, threatened, or other species of concern are in conflict. The goal of the HCP/NCCP is to provide the means for conservation of these species, thereby contributing to their recovery while allowing for compatible and appropriate development to occur.

Conservation Strategies

East Alameda County Conservation Strategy

The East Alameda County Conservation Strategy (EACCS) is a collaborative effort to preserve endangered species by developing and adopting a guide to long-term protection of endangered species. The inventory area for this conservation strategy includes the cities of Dublin, Pleasanton, and Livermore, as well as unincorporated areas of eastern Alameda County. Annual grassland, seasonal and permanent wetlands, riparian woodland, oak woodland, and scrub communities within the inventory area are known to support several listed or sensitive wildlife species, including California tiger salamander, San Joaquin kit fox, Alameda whipsnake, and California red-legged frog.

The EACCS describes current biological conditions in the region, which present a baseline for species habitat with which to compare future development. It also provides a long-term regional conservation strategy to protect species by prioritizing habitats that should be protected or restored.

From a regulatory perspective, the EACSS is intended to streamline and simplify the issuance of Section 404 permits for future projects. It standardizes avoidance, minimization, mitigation, and compensation requirements to comply with federal, State, and local laws and regulations relating to biological and natural resources in the study area. The core of the EACCS for the covered species is the application of standardized mitigation ratios for each species to offset project impacts. In May 2012, USFWS issued a Programmatic Biological Opinion (Programmatic BO) for USACE-permitted projects using the EACCS for projects that may affect one or more of the species covered in the EACCS and Programmatic BO. The Programmatic BO is issued to USACE for permits, enforcement actions, or mitigation banks that are under the agency's jurisdiction. Eligible projects may be appended to the Programmatic BO to obtain individual incidental take authorization. To be eligible, individual projects must be consistent with the EACCS and fall under the list of activities covered by the Programmatic BO. Covered activities include residential, commercial, and industrial development and associated infrastructure (roads and utilities); infrastructure projects, such as transmission lines, road construction and maintenance, trail construction and maintenance, bridge construction and maintenance, solar projects, wind energy projects, and culvert installation and maintenance; and restoration projects, including pond and stream restoration and enhancement, fish barrier removal and modification, and wetland construction and maintenance.

Santa Rosa Plain Conservation Strategy

The Santa Rosa Plain Conservation Strategy (2005) creates a long-term program to mitigate potential adverse effects on listed species related to future development on the Santa Rosa Plain, which is located in central Sonoma County, bordered on the south and west by the Laguna de Santa Rosa, on the east by the foothills, and on the north by the Russian River. The plain and adjacent areas are characterized by vernal pools, seasonal wetlands, and associated grassland habitat that supports several species of flora and fauna listed under the ESA as threatened or endangered, including the threatened California tiger salamander and four endangered plant species: Burke's goldfields, Sonoma sunshine, Sebastapol meadowfoam, and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*).

The conservation strategy was created to (1) provide a plan for local agencies, developers, and community groups that would preserve and enhance populations and habitat of the listed species; (2) support the issuance of a USFWS authorization for incidental take of California tiger salamander and listed plants that may occur in the course of carrying out a broad range of activities on the plain; and (3) protect stakeholders' (public and private) interests. It is based in part on the Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan (1995).

The conservation strategy addresses various aspects of urban and rural growth and its effects on the above-listed species, mitigation for impacts on these listed species and wetlands, and the conservation

and recovery of the listed species and their habitat. It identifies the Southwest Santa Rosa Preserve System and nine "conservation areas" throughout the plain as the locations where mitigation for project-related impacts on listed species and vernal pools should be directed. The designation of conservation areas is based on the following factors: (1) known distribution of California tiger salamander, (2) presence of suitable California tiger salamander habitat, (3) presence of large blocks of natural or restorable land, (4) adjacency to existing preserves, and (5) known location of the listed plants. A critical component of the conservation strategy is that 350–900 acres of actual preserve land ultimately will be established within each conservation area.

While local jurisdictions participating in the conservation strategy have adopted the Santa Rosa Plain Conservation Strategy Planning Agreement, numerous important implementation issues still must be resolved before the conservation strategy can be put into full effect. However, the USFWS Programmatic BO (2007) can still be invoked for projects that have suitable habitat for California tiger salamander, Burke's goldfields, Sonoma sunshine, Sebastapol meadowfoam, and many-flowered navarretia and that would affect wetlands in the Santa Rosa Plain.

Bay Conservation and Development Commission Acts and Plans

Suisun Marsh Preservation Act of 1977 and Suisun Marsh Protection Plan

The *Nejedly-Bagley-Z'berg Suisun Marsh Act* was enacted in 1974 to require the San Francisco BCDC and CDFW to prepare a plan (later called the *Suisun Marsh Protection Plan*) to preserve the integrity and ensure continued wildlife use of the Suisun Marsh, approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County. The Suisun Marsh is the largest remaining brackish wetland complex in San Francisco Bay, more than 10% of California's remaining wetland area, and a wildlife habitat of international importance. The Suisun Marsh Preservation Act (PRC Sections 29000–29612) was enacted in 1977 to incorporate the findings and policies contained in the *Suisun Marsh Protection Plan* of 1976 into State law, and to empower BCDC to implement the plan through its regulatory authority.

The *Suisun Marsh Protection Plan*, in brief, proposes (1) a primary management area encompassing the 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways over most of which BCDC now has jurisdiction and (2) a secondary management area of approximately 22,500 acres of significant buffer lands. Under specific guidelines in each area, Solano County would be responsible for preparing and administering a local protection program. BCDC would represent the State's interest, serving as the land use permitting agency for major projects in the primary management area, and as an appellate body with limited functions in the secondary management area.

San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan) was developed by BCDC in 1968, and its provisions are currently maintained and carried out by BCDC. Since the adoption of the Bay Plan, implementing legislation has been amended several times, but the general character, scope of authority, and area of jurisdiction are largely unchanged. The Bay Plan provides the findings and policies to guide future uses of the bay and shoreline, certain waterways, salt ponds and managed wetlands, and the maps that apply these policies to BCDC's jurisdiction.

Regional Shoreline Adaptation Plan

In 2023, Governor Newsom signed SB 272: Sea Level Rise Adaptation and Planning, which requires local governments across the California coast and San Francisco Bay plan for adaptation to rising sea levels with the targeted assistance of the State. The Regional Shoreline Adaptation Plan is a region-wide plan for the San Francisco Bay shoreline that guides the creation of coordinated locally planned sea level rise adaptation actions that work together to achieve a regional One Bay Vision. This includes BCDC's

guidelines for how local governments must meet the requirements of SB 272, including preparation of a Subregional Shoreline Adaptation Plan (Subregional Plan) by 2034.

City and County General Plans

The most comprehensive land use planning for the San Francisco Bay Area region is provided by city and county general plans, which local governments are required by State law (California Government Code Section 65300 et seq.) to prepare as a guide for future development. Issues pertaining to biological resources are described primarily in the conservation and open space elements of general plans. These elements typically address tree removal and protection policies, conservation of native vegetation, preservation of open space and wildlife habitat corridors, and protection of sensitive species.

Assembly Bill 1889

Assembly Bill 1889 (2024), also known as the "Room to Roam Act" amended Section 65302 of the Government Code to require cities and counties to review and update the conservation element of their general plans in the next adoption or revision of one or more elements on or after January 1, 2028, to:

- identify and analyze connectivity areas, permeability, and natural landscape areas within the jurisdiction;
- identify and analyze existing or planned wildlife passage features to ensure that projected development does not undermine their effectiveness;
- consider the impacts of development and the barriers caused by development to wildlife and habitat connectivity;
- avoid, minimize, or mitigate impacts and barriers to wildlife movement to the extent feasible; and
- analyze and consider opportunities to remediate existing barriers to wildlife connectivity and restore degraded habitat and open space.

Tree Protection Policies and Regulations

Many jurisdictions also have adopted Tree Protection regulations in local municipal codes, as well as Oak Woodlands Conservation plans enacted pursuant to Sections 1360–1372 of the California Fish and Game Code, described above.

3.5.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NOAA Fisheries (Criterion BIO-1a);
- have substantial adverse impacts on designated critical habitat for federally listed plant and wildlife species (Criterion BIO-1b);
- have a substantial adverse effect on riparian habitat, State- or federally protected wetlands (including but not limited to marsh, vernal pool, coastal), or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by CDFW or USFWS, through direct removal, filling, hydrological interruption, or other means (Criterion BIO-2);

- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites (Criterion BIO-3);
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or with provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan (NCCP); or other approved local, regional, or State HCP (Criterion BIO-4); or
- have the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species (Criterion BIO-5).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on biological resources based on the location of the proposed plan's footprints associated with the forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of and potential distribution of sensitive biological resources throughout the Bay Area. The effects of the proposed plan policies are presented qualitatively and are generally captured in the evaluation of the physical effects of the project. Quantitative results are presented for the region (i.e., the entire growth footprint, often summarized by county).

For this impact assessment, a geographic information system (GIS) was used to digitally overlay the proposed plan's footprints associated with forecasted land use development, sea level rise adaptation projects, and transportation projects onto documented locations of critical habitat for federally listed species and wetlands and other waters. Potential impacts were determined by evaluating whether the projected footprints would occur within the potential range of a special-status species, whether projected growth and projects would potentially directly encroach upon an area of ecological significance (e.g., sensitive natural community or habitat, designated critical habitat, important wildlife corridor), or whether the projected development and projects could involve the filling of wetlands. Existing data and other resources used to identify potentially affected biological resources included the CNDDB (CNDDB 2025), NWI mapping (NWI 2025), and mapping by the Conservation Land Network. A quantitative analysis of the potential for impacts (e.g., acres of critical habitat, acres of mapped wetland types potentially affected) was performed.

The GIS-based approach for this programmatic analysis likely overestimates actual impacts because of the coarse level of the analysis and resource-mapping limitations. For example, as described previously, many special-status species occurrences from the CNDDB indicate only presence within a general area at the time of observation. In addition, many CNDDB species locations are historical, and habitat no longer occurs for the species because of urbanization. Therefore, a land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint polygon intersection with a special-status species polygon simply indicates that the species may, or did once, occur in that area and that projects within those areas may affect that species if habitat for the species still occurs within or adjacent to the specific project site. Conversely, because the CNDDB is a positive occurrence database (i.e., only known occurrences that were voluntarily reported by an observer are included), it does not predict where all special-status species may occur, and some species may be underrepresented.

This analysis assumes that impacts on biological resources would be most likely to occur where land use development, sea level rise adaptation projects, and transportation projects could affect ecologically

sensitive or significant areas. Projects most likely to affect sensitive biological resources are those involving major ground-disturbing activity. Road widenings, highway extensions, interchange projects, bridges, and rail extensions in rural areas or in or over water bodies or wetlands also have a higher likelihood of affecting sensitive biological resources. Laws and regulations protecting special-status species, areas of ecological significance, and wetland resources are effective incentives for project proponents to design alternatives that either avoid or substantially reduce impacts on these resources.

This evaluation of biological resource impacts assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to applicable standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. For additional information on analysis methodology, refer to Section 3.1.3, "General Methodology and Assumptions."

IMPACTS AND MITIGATION MEASURES

Impact BIO-1a: Have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NOAA Fisheries (PS)

Special-status species that could occur in the plan area are described in Section 3.5.1, "Environmental Setting," and are listed in **Table C-1** in Appendix C. The list of species that would be potentially affected was generated from a GIS-based analysis of project proximity to documented special-status species occurrences, proximity to critical habitat designated by USFWS and NOAA Fisheries, review of the CDFW Special Animals List, and review of the geographic range and habitat associations of species of the Special Animals List (CDFW 2025; CNDDB 2025; CNPS 2025; USFWS 2025). Additionally, nonlisted species (i.e., not listed under the federal ESA or CESA) that are not consistently tracked by CDFW in the CNDDB but are afforded protections under the California Fish and Game Code and the Migratory Bird Treaty Act were also considered.

Focused biological resource surveys to determine the locations and extent of special-status species populations have not been conducted in support of this programmatic EIR; detailed and site-specific surveys are more appropriately conducted when project-level detail is available. Therefore, this analysis conservatively assumes that special-status species would be present within the impact footprint of regional growth/land use changes, a sea level rise adaptation project, or a transportation project if the project is mapped as containing or located near a known species occurrence. Known occurrences are those mapped in reliable data sources (e.g., CNDDB, USFWS Environmental Conservation Online System). However, CNDDB includes historical occurrences for species that may no longer be extant at a given location, and this may lead to an overestimation of development impacts on special-status species in this EIR. Conversely, the CNDDB records are limited to those voluntarily reported and do not represent a comprehensive inventory of special-status species in an area. These projects could adversely affect special-status plant and wildlife species.

Land Use Impacts

Construction and Operation

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050 the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that result in focused housing and job growth concentrated primarily in or adjacent to already urban and built-up areas and along existing transit

corridors. As shown in **Table 2-3** in Chapter 2, "Project Description," the land use growth footprint covers approximately 34,600 acres of land in the Bay Area. In addition, the proposed plan incorporates environmental strategies, including Strategy EN5, Protect and Manage High-Value Conservation Lands, that would protect some high-priority natural lands. Nonetheless, implementation of the proposed plan's forecasted development pattern could result in regional impacts on special-status species. Potential regional effects on special-status species could occur as a result of habitat fragmentation, increased human intrusion into wildland areas, introduction of invasive species, disruption of migratory corridors, and a resulting regional reduction in biological diversity.

Potential localized effects on special-status species include the temporary and permanent removal or conversion of vegetation and habitat necessary for species breeding, feeding, dispersal, or sheltering. Construction of projects and ongoing operations could result in direct mortality of special-status plants and wildlife, entrapment of wildlife in open trenches, and general disturbance because of noise or vibration during pile driving, earthmoving, and other construction activities for species present in disturbance areas. Construction-generated fugitive dust accumulation on surrounding vegetation and construction-related erosion, runoff, and sedimentation could degrade the quality of adjacent vegetation communities, affecting their ability to support special-status plants and wildlife. Habitat fragmentation and disruption of migratory corridors could also occur on a local level, potentially affecting local populations by making them more vulnerable to extirpation.

Because the proposed plan's forecasted development pattern could result in the disturbance or loss of special-status plant and wildlife species and habitats, this impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction and Operation

As described in Chapter 2, "Project Description," sea level rise adaptation projects could include the implementation of elevated roadways and rail infrastructure, levees, sea walls, tidal gates, and marsh land restoration. Potential effects of sea level rise adaptation projects on special-status plant and wildlife species are generally like those described above for the land use growth footprint under the proposed plan. In this case, most potential impacts on special-status species would occur in association with adaptation projects that would result in earthmoving or vegetation removal activities (e.g., elevated roadways and rail infrastructure, levees, sea walls, tidal gates) that are currently within or adjacent to occupied habitat or habitat suitable for special-status species. While marsh land restoration projects would likely benefit special-status species that occur in marsh habitats, overall, these projects could result in temporary adverse effects on these resources.

Because the implementation of sea level rise adaptation projects may result in construction that results in the disturbance or loss of special-status plant and wildlife species and habitats, this impact would be potentially significant (PS).

Transportation System Impacts

Construction

Construction of proposed transportation projects could affect adjacent wetlands, woodlands, shrublands, and grasslands, as well as associated plant and wildlife species. Because the proposed transportation projects are mainly concentrated along existing transportation corridors, where existing conditions in adjacent habitat areas typically represent the result of past and ongoing disturbance, regional habitat loss and fragmentation is expected to be lower than if projects were entirely new construction or sited in previously undeveloped areas. Nonetheless, these and other transportation projects - particularly new rail projects located in areas that have not been subject to previous ground disturbance - could contribute to

regional and local habitat loss and fragmentation. Due to the potential for habitat loss and fragmentation noted above, construction impacts would be potentially significant (PS).

Operation

Long-term increases in the volume of vehicular traffic and major expansions of existing roads or development of new roads in rural areas are expected to result in increased automobile-related wildlife mortalities and injuries of common and special-status wildlife species. This effect would be most pronounced in rural areas, where roads traverse larger expanses of natural habitats.

Because the proposed plan transportation projects may result in the disturbance or loss of special-status plant and wildlife species and habitats, this impact would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in adverse effects on special-status species, particularly with respect to habitat loss, fragmentation, and degradation. Because the proposed plan could result in the disturbance or loss of special-status plant and wildlife species and habitats, this impact would be **potentially significant (PS)**. Mitigation Measure BIO-1(a) addresses this impact and is described below.

Mitigation Measures

Mitigation Measure BIO-1(a) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Implementing agencies shall require project sponsors to prepare biological resource assessments for specific projects proposed in areas known or likely to contain habitat suitable for special-status plants and wildlife, such as sites that are not surrounded by urban development and/or have not been previously disturbed or developed. The assessment shall be conducted by qualified professionals pursuant to adopted protocols and agency guidelines, where applicable. Where the biological resource assessments establish that mitigation is required to avoid and minimize direct and indirect adverse effects on special-status plant and wildlife species, or compensate for unavoidable effects, mitigation shall be developed consistent with the requirements or standards of CEQA, USFWS, CDFW, and local regulations and guidelines, in addition to requirements of any applicable and adopted HCP/NCCP or other applicable plans developed to protect species or habitat.
- For proposed plan projects subject to CEQA or NEPA, or subject to permitting processes and review by CDFW, USFWS, and NOAA Fisheries, pre-project biological surveys shall be conducted as part of the CEQA/NEPA process to determine the presence and extent of sensitive habitats and species in the project vicinity. Surveys shall follow established methods and shall be conducted at times when the subject species is most likely to be identified. In cases where impacts on State- or federally listed plant or wildlife species are possible, formal protocol-level surveys may be required on a species-by-species basis to determine the local presence and distribution of these species. Coordination with CDFW, USFWS, and NOAA Fisheries, as appropriate, shall be conducted early in the planning process at an informal level for projects that could adversely affect federal or State candidate, proposed, threatened, or endangered species to determine the need for consultation or permitting actions. Projects shall obtain incidental take authorization from the permitting agencies, as required, before project implementation.
- A species and habitat compensation plan shall be prepared and implemented for unavoidable direct impacts on special-status plant species and shall be reviewed and approved by the resource agencies and lead agency prior to project approval. The plan shall identify effective methods for reestablishing

the affected species and habitat, including but not limited to seed collection, salvage of root masses, and planting seeds and/or root masses in an area with suitable conditions. The plan shall also specify a monitoring program designed to evaluate success in reestablishing the affected species and habitat, and remedial measures that shall be followed if the project is not meeting specified performance criteria. The monitoring program shall be designed and implemented to evaluate the current and probable future health of the resources, and their ability to sustain populations in keeping with natural populations following the completion of the program. Remedial measures are highly dependent upon the species and habitats in question, but generally shall include but not be limited to invasive species management, predator control, access control, replanting and reseeding of appropriate habitat elements, regarding, and propagation and seed bulking programs.

- Project designs shall be reconfigured, whenever practicable, to avoid special-status species and sensitive habitats. Projects shall minimize ground disturbances and transportation project footprints near sensitive areas to the extent practicable.
- Temporary access roads and staging areas shall not be located within the areas containing sensitive plants or wildlife species wherever feasible, to avoid or minimize impacts on these species.
- Project activities in the vicinity of sensitive resources shall be completed during the period that best avoids disturbance to plant and wildlife species present to the extent feasible.
- Individual projects shall minimize the use of in-water construction methods in areas that support sensitive aquatic species, especially when listed species could be present.
- If equipment needs to operate in any watercourse with flowing or standing water where special-status species may be affected, a qualified biological resource monitor shall be present to alert construction crews to the possible presence of such special-status species.
- If project activities involve pile driving or vibratory hammering in or near water, interim hydroacoustic threshold criteria for protected fish species shall be adopted as set forth by the Interagency Fisheries Hydroacoustic Working Group, as well as other avoidance methods to reduce the adverse effects of construction to sensitive fish, piscivorous birds, and marine mammal species.
- A qualified biologist shall locate and fence off sensitive resources before construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction.
- For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews and contractors (primarily crew and construction foremen) before construction activities begin.
- Biological monitoring shall be considered for areas near identified habitat for State- and federally listed species, and a “no take” approach shall be taken whenever feasible during construction near special-status plant and wildlife species.
- *Mitigation Measure NOISE-1* shall be implemented when permanent or temporary noise has been identified as having a potential impact on wildlife.
- Impacts resulting from nighttime lighting associated with construction and future permanent lighting shall be assessed at the project level. This assessment shall include an analysis of current light sources in the vicinity of the project. All feasible measures to reduce impacts from nighttime lighting shall be considered and implemented at the project level based on site-specific conditions. They may include but shall not be limited to the following measures:
  - To the extent feasible, nighttime lighting sources shall not be installed in areas that contain or are likely to contain habitat suitable for special-status species.

- Nighttime lighting shall be directed at the construction or project site and away from sensitive habitats. Light glare shields shall be used to reduce the extent of illumination onto adjoining areas. Permanent lighting shall be shielded and directed at intended use areas.
- LEDs or bulbs installed as part of a project shall be rated to emit or produce light at or under 2700 Kelvin, which results in the output of a warm white color spectrum.
- Physical barriers, including solid concrete barriers or privacy slats in cyclone fencing, shall be installed where they have the potential to reduce illumination from overhead lights and automobile lights. Barriers should only be utilized as a light pollution minimization measure if they do not create a substantial barrier to wildlife movement such that the height and/or width of the barrier do not allow wildfire to move through the area. Additional barrier types should be employed when feasible, such as privacy slats into the spacing of cyclone fencing to create light barriers for areas outside the roadway.
- Reflective highway markers shall be used to reduce raptor collisions on roadways.
- Projects on previously unlit roadways with adjacent sensitive habitat and open space shall explore design options that address safety needs without the use of artificial lighting.
- If nighttime lighting has the potential to result in adverse effects on a listed or candidate wildlife species (e.g., a nest, den, or other important habitat feature is identified near the project site), then consultation with the appropriate natural resource agency may be required.

- Fencing and/or walls shall be built to avoid temporary or permanent access of humans or domestic animals from development areas into areas occupied by special-status species. Spoils, trash, or any debris shall be removed offsite to an approved disposal facility.
- Project activities shall comply with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures protective of special-status species.
- Compensatory mitigation for unavoidable loss of habitat or other impacts on special-status species may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning (RAMP) (i.e., Conservation and Mitigation Banking, natural community conservation planning, Regional Conservation Investment Strategies), as deemed appropriate by the permitting agencies. Projects will prioritize mitigation banking within the same county as the project, if possible (i.e., if mitigation banks or mitigation credits are available in a given county).

Significance after Mitigation

To the extent that a local agency requires an individual project to implement the feasible mitigation measure described above, as applicable, the impact would be less than significant with mitigation (LTS-M) because these mitigation measures would require pre-project surveys and biological monitoring, avoidance or minimization of project-related disturbance or loss of special-status species, and coordination with permitting agencies as required prior to project implementation.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact BIO-1b: Have substantial adverse impacts on designated critical habitat for federally listed plant and wildlife species (PS)

Land Use Impacts

Construction and Operation

As shown in **Tables 3.5-2, 3.5-3, and 3.5-4**, land use growth footprints within the plan area overlap with a total of 3,910 acres of land designated by USFWS as critical habitat for 11 federally listed species. Critical habitat for most species occurs within local units distributed throughout the region. Therefore, where local impacts on critical habitat may occur, they could potentially aggregate to produce regionwide effects on the amount and quality of critical habitat. The majority of potential impacts are related to critical habitat for Delta smelt, Contra Costa goldfields, vernal pool tadpole shrimp, vernal pool fairy shrimp, and Conservancy fairy shrimp. Development could also potentially affect smaller amounts of critical habitat for several other species, including Alameda striped racer (whipsnake, Contra Costa goldfields, vernal pool fairy shrimp, vernal pool tadpole shrimp, California red-legged frog, Conservancy fairy shrimp, California tiger salamander, Bay checkerspot butterfly, Franciscan manzanita, and Antioch Dunes evening primrose. Impacts would occur primarily in Contra Costa and Solano counties.

Table 3.5-2: Acreage of Project Footprint within Critical Habitat

Status	Critical Habitat	Land Use Growth (acres)	Sea Level Rise Adaptation Projects (acres)	Transportation Projects (acres)
Endangered Species	Antioch Dunes Evening Primrose	0	30	0
	California Tiger Salamander[1]	80	0	30
	Conservancy Fairy Shrimp	280	0	0
	Contra Costa Goldfields	450	0	30
	Contra Costa Wallflower	0	30	
	Franciscan Manzanita	3	0	0
	Suisun Thistle	0	200	0
	Tidewater Goby	0	210	0
	Vernal Pool Tadpole Shrimp	380	0	6
	Yellow Larkspur	0	160	0
Threatened Species	Alameda Striped Racer (Whipsnake)	100	0	0
	Bay Checkerspot Butterfly	0	30	0
	California Red-Legged Frog	90	680	110
	Delta Smelt	2,170	5,440	130
	Marbled Murrelet	<1	100	0
	Northern Spotted Owl	<1	0	0
	Vernal Pool Fairy Shrimp	370	0	50
	Western Snowy Plover	0	110	0

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).

[1] California tiger salamander is considered endangered in Sonoma County and threatened in Central California.

Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Impacts on critical habitat could include temporary or permanent habitat loss. Degradation of areas that have high conservation value for these species could also occur in association with proposed plan development, where such development occurs within or adjacent to critical habitat, through the introduction of night lighting, increases in ambient noise levels, and the introduction of invasive species and predators. Plan development could also result in the introduction of, or increases in, additional vehicular or recreational pressures in areas designated as critical habitat. Although direct effects on salmonid critical habitat are not expected, disturbances outside critical habitat could generate erosion, sedimentation, or other water quality impacts on salmonid critical habitat downstream.

Because the proposed plan's forecasted development pattern may result in the loss or degradation of designated critical habitat for federally listed plant and wildlife species, this impact would be potentially significant (PS).

Table 3.5-3: Number of Species and Acreage of Project Footprint within Critical Habitat

Footprint		Number of Species	Total (acres)
Land Use Growth	Endangered Species	5	1,190
	Threatened Species	6	2,720
Sea Level Rise Adaptation	Endangered Species	5	630
	Threatened Species	5	6,360
Transportation Project	Endangered Species	3	70
	Threatened Species	3	290

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100.
Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 3.5-4: Number of Species and Acreage of Land Use Growth Footprint within Critical Habitat

County	Number of Species	Total (acres)
Alameda	5	120
Contra Costa	3	2,260
Marin	2	<1
Napa	1	<1
San Francisco	1	3
San Mateo	2	3
Santa Clara	0	0
Solano	5	1,450
Sonoma	1	80
Regional Total[1]	11	3,910

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
[1] Total indicates total number of species in the region.
Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Sea Level Rise Adaptation Impacts

Construction and Operation

As shown in **Tables 3.5-2, 3.5-3, and 3.5-5**, the sea level rise adaptation footprint within the plan area overlaps with approximately 7,000 acres of land designated by USFWS as critical habitat for 10 federally listed species. Critical habitat for most species occurs within local units distributed throughout the region. Therefore, if local impacts occur, they could potentially aggregate to produce regionwide effects on the amount and quality of critical habitat. The majority of potential impacts are related to critical habitat for Delta smelt. Development could also potentially affect smaller amounts of critical habitat for

several other species, including Suisun thistle, marbled murrelet, western snowy plover, tidewater goby, Antioch Dunes evening primrose, Contra Costa wallflower, yellow larkspur, and Contra Costa goldfields. Impacts would occur primarily in Solano and Contra Costa Counties.

Table 3.5-5: Number of Species and Acreage of Sea Level Rise Adaptation Projects Footprint within Critical Habitat

County	Number of Species	Total (acres)
Alameda	1	20
Contra Costa	3	1,770
Marin	3	410
Napa	0	0
San Francisco	0	0
San Mateo	4	870
Santa Clara	0	0
Solano	2	3,930
Sonoma	0	0
Regional Total	10	7,000

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.

Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Potential effects of sea level rise adaptation projects on designated critical habitat are generally similar to those described above for land use development under the proposed plan. In this case, most impacts on critical habitat would occur in association with sea level rise adaptation projects that would result in earthmoving activities (e.g., elevated highway/roadway, levees, sea walls, tidal gates) in locations that are currently on the boundary of, or that traverse, critical habitat.

Because the proposed sea level rise adaptation projects may result in permanent or temporary disturbance or loss of designated critical habitat for federally listed plant and wildlife species, this impact would be potentially significant (PS).

Transportation System Impacts

Construction and Operation

As shown in **Tables 3.5-2, 3.5-3, and 3.5-6**, the transportation projects footprint within the plan area overlaps with approximately 360 acres of land designated by USFWS as critical habitat for six federally listed species. As noted in the land use discussion above, critical habitat for some species occurs within local units distributed throughout the region; therefore, local impacts could potentially combine to produce regional effects. The majority of potential impacts are related to critical habitat for California red-legged frog, Delta smelt, and vernal pool fairy shrimp with smaller amounts of critical habitat for Contra Costa goldfields, and vernal pool tadpole shrimp potentially affected. Impacts would occur primarily in Contra Costa, Alameda, Sonoma, and Solano counties.

Table 3.5-6: Number of Species and Acreage of Transportation Projects Footprint within Critical Habitat

County	Number of Species	Total (acres)
Alameda	2	100
Contra Costa	4	190
Marin	0	0
Napa	0	0
San Francisco	0	0
San Mateo	0	0
Santa Clara	0	0
Solano	4	30
Sonoma	1	30
Regional Total	6	360

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.
California tiger salamander is considered endangered in Sonoma County and threatened in Central California and are counted separately as two different populations of the same species.
Sources: Critical Habitat, USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Potential effects of transportation projects on designated critical habitat are generally similar to those described above for land use development under the proposed plan. In this case, most impacts on critical habitat would occur in association with widening (or otherwise expanding) roads that are currently on the boundary of, or that traverse, critical habitat, as well as constructing new rail projects within the boundaries of, or that traverse, critical habitat.

Because the proposed transportation projects may result in permanent or temporary disturbance or loss of designated critical habitat for federally listed plant and wildlife species, this impact would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects has the potential to result in localized impacts, particularly with respect to habitat loss and degradation, and could adversely affect critical habitat for one or more species on a regional scale. Because the proposed plan may result in the disturbance or loss of critical habitat, this impact would be **potentially significant (PS)**. Mitigation Measure BIO-1(b) addresses this impact and is described below.

Mitigation Measures

Mitigation Measure BIO-1(b) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, for projects that could affect designated critical habitat for federally listed plant and wildlife species that include those identified below (or other equally effective measures):

- Coordination with USFWS and NOAA Fisheries, as appropriate based on the species, shall be conducted early in the environmental review process to determine the need for further mitigation, consultation, or permitting actions. Formal consultation is required for any project with a federal nexus when a listed species or designated critical habitat is likely to be adversely affected. Any conservation measures required by USFWS or NOAA Fisheries as part of formal consultation (e.g., through issuance of a biological opinion) would be implemented.

- Reconfigure project design to avoid or minimize adverse effects on protected species within designated critical habitats.
- Implementing agencies and/or project sponsors shall comply with existing local regulations and policies, including applicable HCP/NCCPs.
- Additionally, implementation of Mitigation Measure BIO-1(a), above, includes an initial biological resource assessment and, if necessary, compensatory mitigation for unavoidable loss of habitat or other impacts on special-status species. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies.

Significance after Mitigation

To the extent that a local agency requires an individual project to implement all feasible and applicable mitigation measures described above, the impact would be less than significant with mitigation (LTS-M). These mitigation measures would require coordination or consultation with USFWS and NOAA Fisheries, as appropriate based on the species, for projects that could adversely affect critical habitat; avoidance or minimization of adverse effects on protected species within critical habitats; and compliance with applicable regulations and policies that protect critical habitat. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions.

As noted above in the Regulatory Setting, pursuant to the requirements of the ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region and whether the proposed project would result in a "take" of such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. The "take" prohibition of the ESA applies to any action that would adversely affect a single member of an endangered or threatened species. "Take," as defined in Section 9 of the ESA, is broadly defined to include intentional or accidental "harassment" or "harm" to wildlife. "Harm" is defined as an act that actually kills or injures wildlife. It may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.[6] Further, because Mitigation Measure BIO-1(b) is tied to existing regulations that are law and binding on responsible agencies and project sponsors, it is reasonable to determine that they would be implemented. Therefore, with the incorporation of Mitigation Measure BIO-1(b), this impact would be **less than significant with mitigation (LTS-M)**.

Impact BIO-2: Have a substantial adverse effect on riparian habitat, State- or federally protected wetlands (including but not limited to marsh, vernal pool, coastal), or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by CDFW or USFWS, through direct removal, filling, hydrological interruption, or other means (PS)

Land Use Impacts

Construction and Operation

Table 3.5-7 summarizes the potential impacts that development within the land use growth footprint could have on State- or federally protected jurisdictional waters, including wetlands, "other waters" (e.g., streams, rivers, lakes, San Francisco Bay), and riparian habitat, based on NWI mapping (NWI 2025). Less

[6] There is currently a proposed rule (Federal Register Vol. 90 No. 73, USFWS 2025) to rescind the definition of "harm" from ESA's "take" definition; however, a final rule has not been published.

than 2% of the land use growth footprint, located primarily in Alameda, Contra Costa, San Mateo, Santa Clara, Solano, and Sonoma Counties, was identified where future forecasted development could potentially affect wetlands and other waters directly or indirectly. The majority of potentially affected wetlands were associated with freshwater emergent wetlands, riverine features, and freshwater ponds in a variety of locations. The jurisdictional waters impact summaries in these tables were developed using a GIS-based analysis that compared proximity of the land use growth footprint to existing NWI-mapped wetland features, where the land use growth footprint intersects, bridges, or could otherwise affect jurisdictional waters (NWI 2025). Because the analysis examined only mapped streams and wetlands, numerous smaller features not included in the NWI mapping that could be affected are not reflected. Conversely, proximity of the land use growth footprint to jurisdictional waters provides only a coarse indicator of actual impacts.

Table 3.5-7: Acreage of Land Use Growth Footprint within Wetlands

County	Estuarine and Marine Deepwater (acres)	Estuarine and Marine Wetland (acres)	Freshwater Emergent Wetland (acres)	Freshwater Forested/ Shrub Wetland (acres)	Freshwater Pond (acres)	Lake (acres)	Riverine (acres)
Alameda	10	3	40	3	10	4	20
Contra Costa	<1	3	80	20	8	<1	30
Marin	<1	<1	0	0	5	1	6
Napa	0	0	10	0	< 1	0	9
San Francisco	3	4	< 1	0	6	0	0
San Mateo	18	3	<1	2	<1	<1	6
Santa Clara	0	2	6	11	30	0	10
Solano	3	< 1	50	< 1	4	0	20
Sonoma	<1	<1	20	10	10	0	20
Regional Total	30	10	210	50	80	5	110

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Potential impacts of the forecasted development pattern under the proposed plan on wetlands include the temporary disturbance, or permanent loss, of jurisdictional waters, including wetlands; loss or degradation of stream or wetland function; incremental degradation of wetland habitats; and fragmentation of streams and wetlands. Jurisdictional waters in the region vary from relatively small, isolated roadside areas, wet meadows, and vernal pools to major streams and rivers, bays and estuaries, and tidal, brackish, and freshwater marshes. Any fill of jurisdictional waters associated with proposed land development would be a significant impact.

In addition to direct habitat loss, implementation of the forecasted development pattern under the proposed plan could increase the potential for stormwater runoff to carry a variety of pollutants into wetlands, rivers, streams, and San Francisco Bay through increases in the extent of impervious surfaces. Construction runoff often carries grease, oil, and heavy metals (because of ground disturbance) into natural drainages. Furthermore, particulate materials generated by construction could be carried by runoff into natural waterways and could increase sedimentation impacts. Furthermore, if land use development projects are sited in or near shoreline areas containing tidal wetland habitat (e.g., estuarine and marine wetlands), indirect effects on these resources may occur, including disruption of landward migration of these habitats in response to sea level rise.

Adverse effects on State- and federally protected wetlands would be addressed, if feasible, through avoidance of these resources. Where avoidance is not possible, and in accordance with USACE, EPA, USFWS, RWQCB, and CDFW guidelines, a standard of "no net loss" of wetland acreage and value is required. Mitigation to compensate for project-related loss of wetland acreage and functions would be based on project-specific wetland mitigation plans, subject to approval by USACE, RWQCB, CDFW, BCDC, and the California Coastal Commission where applicable. Impacts on jurisdictional waters would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Table 3.5-8 summarizes the potential impacts that sea level rise adaptation projects could have on jurisdictional waters, including wetlands, "other waters," and riparian habitat, based on NWI mapping (NWI 2025). Approximately 44,080 acres of land were identified where sea level rise adaptation projects could have the potential to affect wetlands and other waters directly or indirectly (**Table 3.5-8**).

Table 3.5-8: Acreage of Sea Level Rise Adaptation Projects Footprint within Wetlands

County	Estuarine and Marine Deepwater (acres)	Estuarine and Marine Wetland (acres)	Freshwater Emergent Wetland (acres)	Freshwater Forested/ Shrub Wetland (acres)	Freshwater Pond (acres)	Lake (acres)	Riverine (acres)
Alameda	360	1,750	120	0	250	2,650	30
Contra Costa	110	1,170	720	30	260	140	250
Marin	910	2,370	1,060	70	390	1,020	310
Napa	190	1,610	290	0	60	530	90
San Francisco	410	130	4	0	8	0	0
San Mateo	770	1,260	140	7	110	1,600	40
Santa Clara	40	430	180	3	50	4,400	20
Solano	920	1,200	2,350	4	360	470	590
Sonoma	700	6,050	4,190	<1	430	150	330
Regional Total	4,410	15,970	9,050	110	1,920	10,960	1,660

Notes: Numbers less than 1 are shown as "<1"; Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Potential effects of sea level rise adaptation projects on wetlands and other waters are generally similar to those described above for land use development under the proposed plan. In this case, most impacts on wetlands and other waters would occur in association with sea level rise adaptation projects that would result in earthmoving activities (e.g., elevated roadways and rail infrastructure, levees, sea walls, tidal gates) in areas that contain or are adjacent to wetlands or other waters. While marshland restoration projects would likely result in an overall beneficial impact on wetlands and other waters, these projects could also result in temporary adverse effects on these resources. Additionally, if sea walls or levees are sited in areas containing or adjacent to wetland habitat (e.g., estuarine and marine wetlands [or, tidal wetlands]), indirect effects on these resources may occur, including disruption of the existing hydrology of these habitats.

Adverse effects on State- and federally protected wetlands would be addressed, if feasible, through avoidance of these resources. Where avoidance is not possible, and in accordance with USACE, EPA, USFWS, RWQCB, and CDFW guidelines, a standard of "no net loss" of wetland acreage and value is required. Mitigation for wetland impacts would be based on project-specific wetland mitigation plans, subject to approval by USACE, RWQCB, CDFW, BCDC, and CCC where applicable. Impacts on jurisdictional waters would be potentially significant (PS).

Transportation System Impacts

Construction and Operation

Table 3.5-9 summarizes the potential impacts proposed transportation projects could have on jurisdictional waters, including wetlands, "other waters" (e.g., streams, rivers, lakes, San Francisco Bay), and riparian habitat. Approximately 270 acres of land, located primarily in Alameda, Santa Clara, and Solano Counties, were identified where transportation projects could have the potential to affect wetlands and other waters directly or indirectly (**Table 3.5-9**). As described above, the jurisdictional waters impact summaries in the tables were developed using a GIS-based analysis that compared transportation project proximity to existing NWI-mapped wetland features, where the project intersects, bridges, or could otherwise affect jurisdictional waters.

Table 3.5-9: Acreage of Transportation Projects Footprint within Wetlands

County	Estuarine and Marine Deepwater (acres)	Estuarine and Marine Wetland (acres)	Freshwater Emergent Wetland (acres)	Freshwater Forested/ Shrub Wetland (acres)	Freshwater Pond (acres)	Lake (acres)	Riverine (acres)
Alameda	9	40	20	<1	3	6	20
Contra Costa	0	<1	2	<1	0	0	4
Marin	0	0	0	0	0	0	<1
Napa	<1	<1	0	0	0	0	0
San Francisco	0	2	0	0	0	0	0
San Mateo	<1	1	0	0	<1	0	3
Santa Clara	<1	50	3	4	<1	1	4
Solano	<1	20	5	<1	8	10	10
Sonoma	2	4	4	9	3	0	20
Regional Total	10	120	30	10	10	20	60

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.

Sources: USFWS 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Potential effects of transportation projects are similar to those discussed above projected growth. Where feasible, State- and federally protected wetlands would be avoided. Where avoidance is not possible, and in accordance with USACE, EPA, USFWS, RWQCB, and CDFW guidelines, a standard of "no net loss" of wetland acreage and value is required. Mitigation for wetland impacts would be based on project-specific wetland mitigation plans, subject to approval by USACE, RWQCB, CDFW, and potentially CCC and BCDC. Impacts on jurisdictional waters resulting from implementation of transportation projects would be potentially significant (PS).

Conclusion

As discussed above, implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in the potential to affect jurisdictional waters and other sensitive habitats. This would be a **potentially significant (PS)** impact. Mitigation Measure BIO-2 addresses this impact and is discussed below.

Mitigation Measures

Mitigation Measure BIO-2 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Implementing agencies shall require project sponsors to prepare biological resource assessments for specific projects proposed in areas containing, or likely to contain, jurisdictional waters or other sensitive or special-status communities. These assessments shall be conducted by qualified professionals in accordance with agency guidelines and standards. Qualified professionals shall reference applicable regional data sources for wetland mapping, which may include, but not be limited to, the Adaptation Atlas (San Francisco Estuary Institute 2021), *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2013), and the 2015 Bay Ecosystem Habitat Goals Update (Goals Project 2015). Where the biological resource assessments establish that mitigation is required to avoid and minimize direct and indirect adverse effects on State- or federally protected wetlands, or compensate for unavoidable effects, mitigation shall be developed consistent with the requirements or standards of USACE, EPA, RWQCB, and CDFW, and local regulations and guidelines, in addition to requirements of any applicable and adopted HCP/NCCP or other applicable plans developed to protect these resources. In keeping with the "no net loss" policy for jurisdictional waters (i.e., wetlands and other waters of the United States or State), project designs shall be configured, whenever possible, to avoid wetlands and other waters and avoid disturbances to wetlands and riparian corridors to preserve both the habitat and the overall ecological functions of these areas. Projects shall minimize ground disturbances and transportation project footprints near such areas to the extent practicable.
  - Project sponsors shall consult with USFWS, NMFS, USFS, CDFW where State-designated sensitive or riparian habitats provide potential or occupied habitat for federally listed rare, threatened, and endangered species afforded protection pursuant to the ESA, the MBTA during the breeding season, CESA, or fully protected species afforded protection pursuant to the State Fish and Game Code and with the CDFW pursuant to the provisions of Section 1600 of the State Fish and Game Code as they relate to Lakes and Streambeds.
- Where avoidance of jurisdictional waters is not feasible, project sponsors shall minimize fill and the use of in-water construction methods, and place fill only with express permit approval from the appropriate resource agencies (e.g., USACE, RWQCB, CDFW, BCDC, CCC) and in accordance with applicable existing regulations, such as the Clean Water Act or local stream protection ordinances.
- Where avoidance of jurisdictional waters is not feasible, project sponsors shall arrange for compensatory mitigation in the form of mitigation bank credits; on-site or off-site enhancement of existing waters; or wetland creation in accordance with applicable existing regulations and subject to approval by USACE, RWQCB, CDFW, BCDC, and/or CCC. If compensatory mitigation is required, the project sponsor shall develop a restoration and monitoring plan that describes how compensatory mitigation will be achieved, implemented, maintained, and monitored. At a minimum, the restoration and monitoring plan shall include clear goals and objectives, success criteria, specifics on restoration/creation/enhancement (e.g., plant palette, soils, irrigation design standards and requirements), specific monitoring periods and reporting guidelines, and a maintenance plan. The following minimum performance standards (or other standards as required by the permitting agencies) shall apply to any wetland compensatory mitigation:
  - Compensation shall be provided at a minimum 1:1 ratio for restoration, preservation, and creation but shall in all cases be consistent with mitigation ratios set forth in locally applicable plans (e.g., general plans, HCP/NCCPs) or in project-specific permitting documentation. Compensatory mitigation may be a combination of on-site restoration/creation/enhancement or off-site restoration, preservation, or enhancement. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies.
  - In general, any compensatory mitigation shall be monitored for a minimum of 5 years and will be considered successful when at least 75% cover (or other percent cover considered appropriate for the vegetation type) of installed vegetation has become successfully established.

- If the restoration is not meeting success criteria, remedial measures shall be implemented and can include, but are not limited to, replanting, reseeding, grading adjustments, supplemental irrigation, access control, increased weed control, and extended maintenance and monitoring periods. After final success criteria have been met and relevant permitting agencies have approved the mitigation project as complete, all mitigation areas shall be permanently conserved (e.g., conservation easement) and managed in perpetuity.

- Salvage and stockpile topsoil (i.e., the surface material from 6 to 12 inches deep) and perennial native plants, when recommended by the qualified wetland biologist, for use in restoring native vegetation to areas of temporary disturbance within the project area. Salvage of soils containing invasive species, seeds and/or rhizomes shall be avoided as identified by the qualified wetland biologist.
- In accordance with CDFW guidelines and other instruments protective of sensitive or special- status natural communities, project sponsors shall avoid and minimize impacts on sensitive natural communities and habitats when designing and permitting projects. Where applicable, projects shall conform to the provisions of special area management or restoration plans, such as the Suisun Marsh Protection Plan and the East Contra Costa County HCP, which outline specific measures to protect sensitive vegetation communities. Where applicable, project sponsors shall consult standards established in the Regional Shoreline Adaptation Plan guidelines to avoid impacts on shoreline habitats.
- If any portion of a sensitive natural community is permanently removed or temporarily disturbed, the project sponsor shall provide compensatory mitigation for the loss. If such mitigation is required by the implementing agency, the project sponsor shall develop a restoration and monitoring plan that describes how compensatory mitigation will be achieved, implemented, maintained, and monitored. At a minimum, the restoration and monitoring plan shall include clear goals and objectives, success criteria, specifics on restoration/creation/enhancement (e.g., plant palette, soils, irrigation design standards and requirements), specific monitoring periods and reporting guidelines, and a maintenance plan. The following minimum performance standards (or other standards as required by the permitting agencies) shall apply to any compensatory mitigation for sensitive natural communities:
  - Compensation shall be provided at a minimum 1:1 ratio for restoration and preservation but shall in all cases be consistent with mitigation ratios set forth in locally applicable plans (e.g., general plans, HCP/NCCPs) or in project-specific permitting documentation. Compensatory mitigation may be a combination of on-site restoration/creation/enhancement or off-site restoration, preservation, or enhancement. Compensatory mitigation may be achieved in advance of impacts through the purchase or creation of mitigation credits or the implementation of mitigation projects through RAMP, as deemed appropriate by the permitting agencies.
  - In general, any compensatory mitigation shall be monitored for a minimum of 5 years and will be considered successful when at least 75% cover (or other percent cover considered appropriate for the vegetation type) of installed vegetation has become successfully established.
  - If the restoration is not meeting success criteria, remedial measures shall be implemented and may include, but are not limited to, replanting, reseeding, grading adjustments, supplemental irrigation, access control, increased weed control, and extended maintenance and monitoring periods. After final success criteria have been met and relevant permitting agencies have approved the mitigation project as complete, all mitigation areas shall be permanently conserved (e.g., conservation easement) and managed in perpetuity.
- All construction materials, staging, storage, dispensing, fueling, and maintenance activities shall be located in upland areas outside of sensitive habitat, and adequate measures shall be taken to prevent any potential runoff from entering jurisdictional waters. Fueling of equipment shall take place within existing paved roads. Contractor equipment shall be checked for leaks prior to operation and repaired, as necessary.

- Construction activities shall be scheduled, to the extent feasible, to avoid sensitive times for biological resources and to avoid the rainy season when erosion and sediment transport is increased.
- Compliance with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures protective of wetlands and other waters or sensitive natural communities.

Significance after Mitigation

To the extent that a local agency requires an individual project to implement the feasible mitigation measure described above, as applicable, the impact would be less than significant with mitigation (LTS-M). These measures would require that sensitive habitat (e.g., jurisdictional waters, sensitive natural communities) be avoided to the extent feasible and that sensitive habitats that cannot be avoided are restored following construction, or if the habitat cannot be restored, that the project proponent compensates for unavoidable losses in a manner that results in no net loss of sensitive habitats and meets applicable regulatory requirements.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. Similar to Impact BIO-1(b), because Mitigation Measure BIO-2 is tied to existing regulations that are law and binding on responsible agencies and project sponsors, it is reasonable to determine that they would be implemented. Therefore, with the incorporation of Mitigation Measure BIO-2, this impact would be **less than significant with mitigation (LTS-M)**.

Impact BIO-3: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites (PS)

Land Use Impacts

Construction and Operation

As discussed in Section 3.5.1, "Environmental Setting," and shown in **Figure 3.5-5**, critical linkages (i.e., riparian buffer zone, important baylands, linkage design, large landscape blocks) occur within all nine Bay Area counties and are typically centered along the region's mountain ranges. These areas are composed primarily of wildlands but may also include some agricultural and developed areas (mostly rural residential) and many are bisected by major roadways. These linkages are not regulatory delineations but have been identified by the CLN as lands likely important to wildlife movement between large, mostly natural areas at the Statewide level. Linkages mapped at this regional level should be considered areas identified at a coarse scale that can inform land-planning efforts. However, the linkages do not include more detailed designs developed at a finer resolution based on the needs of particular species and ecological processes.

The proposed plan's land use growth footprint overlaps with approximately 450 acres of important baylands, 20 acres of large landscape blocks, 40,550 meters of key riparian corridors, 180 acres of linkage designs, and 7,640 acres of riparian buffer zones (**Table 3.5-10**). However, the land use growth footprint is concentrated primarily in or adjacent to already urban and built-up areas and along existing transit corridors where migratory corridors for wildlife have already been fragmented and degraded to the point that their function as linkages is either limited or lost entirely. On a local level, waterways, riparian corridors, and contiguous or semicontiguous expanses of habitat are likely to facilitate wildlife movement, even through urbanized areas in the region. In some cases, land use development projects may directly encroach on wildlife corridors, particularly when direct habitat removal occurs or when sites are located adjacent to open space or streams. Degradation of areas that have high value as wildlife movement corridors could also occur in association with proposed plan development, where such development

occurs adjacent to these corridors, through increases in ambient noise levels and fire frequency, as well as the introduction of lighting, domestic pets, pollution, and invasive species.

Table 3.5-10: Acreage of Land Use Growth Footprint within Critical Linkages

County	Important Baylands (acres)	Large Landscape Blocks (acres)	Key Riparian Corridors (feet)	Linkage Designs (acres)	Riparian Buffer Zones (acres)
Alameda	40	2	4,650	1	1,060
Contra Costa	0	2	10,800	0	1,860
Marin	0	10	1,440	0	220
Napa	0	1	2,100	0	210
San Francisco	0	0	0	0	0
San Mateo	0	4	2,680	0	330
Santa Clara	1	3	15,660	80	3,300
Solano	410	0	0	0	180
Sonoma	0	0	3,230	100	480
Regional Total	450	20	40,550	180	7,640

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Critical linkage features overlap each other, and therefore, the total area of impact is likely overstated.

Sources: Data provided by MTC and ABAG in 2025; data downloaded from CLN in 2025; compiled by Ascent in 2025.

Land use growth could also encroach on nursery sites, which are locations where fish or wildlife concentrate for hatching and/or raising young, such as nesting rookeries for birds (e.g., herons, egrets), spawning areas for native fish, fawning areas for mule deer (*Odocoileus hemionus*), and maternal roosts for bats. The locations of nursery sites in the State are generally not mapped. While most of these sites would likely occur in undeveloped natural areas and the land use growth footprint is located primarily in or adjacent to already urbanized areas, development projects may result in loss or abandonment of wildlife nursery sites.

Construction of land use development projects could result in temporary impediment of wildlife movement corridors due to use of heavy equipment, ground disturbance, or staging and direct removal of wildlife nurseries. Ongoing operations of these projects could result in substantial permanent encroachment on local wildlife corridors or permanent loss or ongoing disturbance (e.g., from light or noise) of wildlife nursery sites; therefore, this would be a potentially significant (PS) impact.

Sea Level Rise Adaptation Impacts

Construction and Operation

The proposed plan's sea level rise adaptation projects footprint overlaps with approximately 19,600 acres of important baylands, 990 acres of large landscape blocks, 298,300 feet of key riparian corridors, 2,800 acres of linkage designs, and 32,800 acres of riparian buffer zones (**Table 3.5-11**). Potential effects of sea level rise adaptation projects on wildlife corridors are generally similar to those described above for land use development under the proposed plan. Construction of sea level rise adaptation projects may result in temporary impediment of wildlife corridors, and in some cases, sea level rise adaptation projects may directly encroach on wildlife corridors, particularly when direct habitat removal occurs or when sites are located adjacent to open space or streams. Implementation of sea level rise adaptation projects also may result in loss or abandonment of wildlife nursery sites. Substantial encroachment on local wildlife corridors or loss of wildlife nursery sites would be a potentially significant (PS) impact.

Table 3.5-11: Acreage of Sea Level Rise Adaptation Projects Footprint within Critical Linkages

County	Important Baylands (acres)	Large Landscape Blocks (acres)	Key Riparian Corridors (feet)	Linkage Designs (acres)	Riparian Buffer Zones (acres)
Alameda	3,110	0	3,040	0	1,440
Contra Costa	1,460	0	15,130	0	2,220
Marin	0	360	92,970	260	8,810
Napa	1,430	0	20,300	0	1,710
San Francisco	0	0	0	0	0
San Mateo	2,540	630	13,820	0	1,300
Santa Clara	5,120	0	32,820	0	4,610
Solano	5,760	0	0	0	530
Sonoma	200	0	117,190	2,480	12,170
Regional Total	19,600	990	298,300	2,800	32,800

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding. Critical linkage features overlap each other, and therefore, the total area of impact is likely overstated.

Sources: Data provided by MTC and ABAG in 2025; data downloaded from CLN in 2025; compiled by Ascent in 2025.

Transportation System Impacts

Construction and Operation

Transportation projects could result in impacts on critical linkages because of major transportation projects in Alameda, Contra Costa, San Mateo, Santa Clara, Solano, and Sonoma Counties. The proposed plan's transportation projects footprint overlaps with approximately 250 acres of important Baylands, 10 acres of large landscape blocks, 12,300 feet of key riparian corridors, 180 acres of linkage designs, and 2,500 acres of riparian buffer zones (**Table 3.5-12**). Many of these transportation projects are expansions or enhancements of existing highways or other transportation routes with existing urban corridors established along them. In these areas, migratory corridors have already been fragmented and degraded to the point that their function as linkages is either limited or has been lost entirely. However, some transportation projects, particularly new rail projects, could be located in areas that have not been subject to previous disturbance and fragmentation.

Table 3.5-12: Acreage of Transportation Projects Footprint within Critical Linkages

County	Important Baylands (acres)	Large Landscape Blocks (acres)	Key Riparian Corridors (feet)	Linkage Designs (acres)	Riparian Buffer Zones (acres)
Alameda	40	7	1,700	150	570
Contra Costa	0	0	3,500	0	400
Marin	0	0	0	30	8
Napa	0	0	0	0	3
San Francisco	0	0	0	0	0
San Mateo	0	0	460	0	30
Santa Clara	60	4	3,800	0	970
Solano	160	<1	820	0	130
Sonoma	0	0	1,900	0	440
Regional Total	250	10	12,300	180	2,500

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Critical linkage features overlap each other, and therefore, the total area of impact is likely overstated.

Sources: Data provided by MTC and ABAG in 2025; data downloaded from CLN in 2025; compiled by Ascent in 2025.

As discussed for projected land development within land use growth footprint, construction activities associated with proposed transportation projects may result in temporary impediments to wildlife corridors, and operation of these projects may directly encroach on local wildlife corridors, particularly when direct habitat removal occurs or when sites are located adjacent to open space or streams. Additionally, as described above, transportation projects may result in loss or abandonment of wildlife nursery sites. Substantial encroachment on local wildlife corridors or loss of wildlife nursery sites would be a potentially significant (PS) impact.

Conclusion

Because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to result in land use changes and localized effects that would directly encroach on local wildlife corridors or result in loss or abandonment of wildlife nursery sites, this impact would be **potentially significant (PS)**. Mitigation Measure BIO-3 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure BIO-3(a) Implementing agencies shall require project sponsors to prepare detailed analyses for specific projects affecting mapped critical linkages to determine the wildlife species that may use these areas and the habitats those species require. Projects that would not affect mapped critical linkages but that are located within or adjacent to open space lands, including wildlands and agricultural lands, or otherwise may contain land used as wildlife movement corridors (e.g., green belts in urban areas) shall also assess whether significant wildlife corridors are present, what wildlife species may use them, and what habitat those species require. The assessment shall be conducted by qualified professionals and according to applicable agency standards with consideration of the local, regional, and global context of landscape connectivity for a given project in a given area.

Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Design projects to minimize impacts on wildlife movement and habitat connectivity and preserve existing and functional wildlife corridors.
- Design projects to promote wildlife corridor redundancy by including multiple connections between habitat patches.
- Consult relevant guidance documents regarding wildlife movement and habitat connectivity during the project design phase, including but not limited to statewide and Bay Area region guides (e.g., CLN mapping, CDFW's California Wildlife Barriers 2020 [CDFW 2020], the California Department of Transportation's Wildlife Crossings Guidance Manual [Meese et al. 2007], Critical Linkages: Bay Area & Beyond [Penrod et al. 2013]), and local guides (e.g., Gray et al. 2018; Diamond and Snyder 2016).
- Conduct wildlife movement studies for projects that may fragment or constrict regional or local corridors and impede use to nursery sites. These studies will include, but would not be limited to, the following objectives: identify activity levels and directional wildlife movement trends within the study area, consult the California Fish Passage Assessment Database (CALFISH database) to identify potential fish barrier locations and conduct first pass and second pass fish assessments as necessary, assess current functionality of existing underpasses, and determine what species or groups of species exhibit sensitivity to the existing roadways. Movement studies shall identify project-specific measures to avoid or mitigate impacts on corridors and movement to nursery sites that may include, but are not limited to, developing alternative project designs that allow wider movement corridors to remain; provide for buffer zones adjacent to corridors, such as passive recreation zones; implement physical barriers that prevent

human and/or domestic predator entry into the corridor or block noise and lighting from development; incorporate shielded and directed lighting in areas near corridors; implement a "natives only" landscaping policy within 200 feet of identified wildlife corridors; incorporate periodic larger habitat patches along a corridor's length; minimize the number of road crossings of identified wildlife corridors; and replace roadway culverts with bridges to allow for wildlife movement.

- For projects that cannot avoid significant impacts on wildlife movement corridors or native wildlife nursery areas, consult with CDFW to determine appropriate measures to minimize direct and indirect impacts and implement measures to mitigate impacts on wildlife corridors or native wildlife nursery sites.
- Conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on- and off-site. Preservation or improvements of habitat on both sides of a wildlife crossing shall be prioritized.
- Analyze habitat linkages and wildlife movement corridors on a broad scale for long linear projects with the possibility of adversely affecting wildlife movement to avoid critical narrow choke points that could reduce function of recognized movement corridor.
- Construct wildlife-friendly overpasses and culverts. These structures shall be designed to meet the needs of appropriate species, considering factors such as the size or diameter of the structure (e.g., large enough to allow a target species to pass through/over or to allow sufficient stream flow), interval frequency, and/or physical design to allow conditions similar to the surrounding habitat (e.g., open-bottom culverts that provide natural substrate on the stream bottom).
- Upgrade existing culverts or implement directional fencing to guide animals to existing culverts or underpasses when conducting expansion or enhancement projects on existing roads.
- Fence major transportation corridors in the vicinity of identified wildlife corridors.
- Use wildlife-friendly fences that allow larger wildlife, such as deer, to jump over (i.e., no greater than 4 to 5 feet tall on average) and smaller wildlife to move under (by leaving a gap under the fence).
- For projects that require the placement of stream culverts in a fish spawning stream, follow USACE, NOAA Fisheries, USFWS, and CDFW permit conditions and design requirements to allow fish passage through the culverts.
- Limit wildland conversions in identified wildlife corridors such that the function of the wildlife corridor is not impaired.
- Retain wildlife-friendly vegetation in and around developments (e.g., native plant species; vegetation that provides sufficient cover, nesting, or foraging opportunities; mature trees; riparian vegetation).
- Monitor and maintain fencing, under crossings, and/or other crossing structures as needed to ensure corridor permeability and functionality. Development and implementation of a fencing and wildlife crossing structure maintenance plan is recommended to maintain permeability for wildlife across corridors.
- Prohibit construction activities within 500 feet of occupied breeding areas for wildlife afforded protection pursuant to Title 14 Section 460 of the CCR (protecting fur-bearing mammals), during the breeding season.
- Comply with existing local regulations and policies, including applicable HCP/NCCPs, that exceed or reasonably replace any of the above measures to protect wildlife corridors.

Mitigation Measure BIO-3(b) Implementing agencies and/or project sponsors shall implement the following measures, where feasible and as applicable based on project- and site-specific considerations:

- Implement Mitigation Measures BIO-1(a) and BIO-2.

Significance after Mitigation

To the extent that a local agency requires an individual project to implement all feasible and applicable mitigation measures described above, the impact would be less than significant with mitigation (LTS-M). These mitigation measures would require assessing whether significant wildlife corridors are present in project areas, minimizing wildland conversions in identified wildlife corridors, implementing wildlife-friendly design features, and complying with regulations and policies to protect wildlife corridors and wildlife nursery sites.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Unlike Mitigation Measures BIO-1(b) and BIO-2, the above mitigation measure is not directly tied to existing regulations that are law and binding on responsible agencies and project sponsors. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact BIO-4: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or with provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan (NCCP); or other approved local, regional, or State HCP (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction and Operation

Local Ordinances. Most counties and cities in the region have local ordinances and policies in place that protect native and nonnative trees in urban landscapes, as well as in unincorporated county lands. These ordinances and policies vary in their definitions of protected trees (e.g., certain species, minimum diameter at breast height, trees that form riparian corridors) and in the requirements for ordinance or policy compliance. Projected growth could result in removal of trees that are protected by local policies or ordinances. The forecasted development pattern, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan could also result in conflicts with other local policies or ordinances that protect locally significant biological resources, such as creek or wetland protection ordinances. However, for most land use development projects and transportation projects, ground disturbances would occur within existing urban and built-up areas and existing transportation corridors. Because ground disturbances would be limited mostly to these existing disturbed areas, the potential removal of native trees and disturbances to other biological resources protected by local policies or ordinances are expected to be moderate.

All future land use development, sea level rise adaptation projects, and transportation projects would be required to follow city and county development requirements, including compliance with local policies, ordinances, and applicable permitting procedures related to protection of biological resources. Additionally, project-level planning, environmental analysis, and compliance with existing local regulations and policies would identify potentially significant tree removal or other potential conflicts with local policies; minimize or avoid those impacts through the design, siting, and permitting process; and provide mitigation for any significant effects as a condition of project approval and permitting. Therefore, the potential for approved development projects, sea level rise adaptation projects, and transportation projects to conflict with local policies or ordinances protecting biological resources would be less than significant (LTS).

HCPs and Other Approved Plans. The San Bruno Mountain Area HCP (County of San Mateo 1982) was adopted by the County of San Mateo and the Cities of Brisbane, Daly City, and South San Francisco in 1982; however, no projects under the proposed plan are located on lands covered under this HCP. Projects under the

proposed plan would occur on lands covered by several other adopted plans, as well as plans pending formal adoption, within the region. The East Contra Costa County HCP and NCCP (ECCC HCP/NCCP) (ECCC HCPA 2006) was adopted by Contra Costa County and the Cities of Brentwood, Clayton, Oakley, and Pittsburg and went into effect in 2008. Some of the proposed plan's forecasted development pattern and proposed sea level rise adaptation projects are located within the ECCC HCP/NCCP urban development areas. Development within ECCC HCP/NCCP urban development areas, generally defined as areas within the county urban limit line, is a "covered activity." The Santa Clara Valley Habitat Plan (SCVHP) (County of Santa Clara et al. 2012) was approved and adopted in 2013 by the County of Santa Clara; the Santa Clara Valley Transportation Authority; the Santa Clara Valley Water District; and the Cities of San Jose, Gilroy, and Morgan Hill. Development in the land use growth footprint under the proposed plan in Santa Clara County may qualify for coverage under the SCVHP. The Santa Rosa Plain Conservation Strategy (USFWS 2005) and the East Alameda County Conservation Strategy (EACCSSC 2010) have not yet been adopted, as of June 2025, by their local agency partners, but nonetheless influence projects requiring Section 7 or 10 consultation under the federal ESA within their boundaries. Programmatic biological opinions have been issued in each case that guide the development of avoidance and minimization measures for projects within areas covered by each conservation strategy, as well as compensatory mitigation measures. The Solano Multispecies Habitat Conservation Plan has not yet been adopted, as of June 2025, but may be approved and adopted during the planning horizon of the proposed plan. Finally, several projects occur within the California Coastal Zone and are subject to the requirements of local coastal plans.

The forecasted development pattern, sea level rise adaptation projects, and transportation projects in the proposed plan located within the ECCC HCP/NCCP and SCVHP boundaries must demonstrate consistency with the HCP/NCCP. For example, sponsors of covered projects are required to comply with the ECCC HCP/NCCP mitigation measures. For the ECCC HCP/NCCP, covered projects must submit a complete HCP/NCCP application package; submit required fees; fulfill the appropriate HCP survey requirements for wildlife, plants, wetlands, and sensitive habitats; and comply with all applicable conservation measures, outlined in Chapter 6 of the HCP. Activities that are not covered under that plan, as well as other projects elsewhere in the region where plans are underway or have not yet formally been adopted, must pursue individual project permitting for impacts on biological resources until such time as the specific activity/project is identified as a covered activity in an applicable plan. Typically, once a plan or conservation strategy has been developed for an area, wetland and wildlife agency permitting conditions and requirements for projects within that area will be consistent with that plan or strategy whether or not it has been adopted, as is the case for projects in the Santa Rosa Plain, for example. Because consistency with an adopted HCP or other conservation plan is a legal requirement, and because the design, approval, and permitting of future land use development projects, sea level rise adaptation projects, and transportation projects within an area covered by an HCP or other conservation plan are intended and expected to comply with that requirement, the impacts related to potential conflicts with the provisions of adopted HCPs, NCCPs, or other approved local, regional, or State habitat conservation plans would be less than significant (LTS).

Conclusion

As discussed above, implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would be required to follow city and county development requirements, including compliance with local policies, ordinances, and applicable permitting procedures related to protecting biological resources. Additionally, consistency with an adopted HCP or other conservation plan is a legal requirement, and the design, approval, and permitting of future development and transportation projects within an area covered by an HCP or other conservation plan are intended and expected to comply with that requirement. Therefore, the potential for approved land use development, sea level rise adaptation projects, and transportation projects to conflict with local policies or ordinances protecting biological resources, or with the provisions of adopted HCPs, NCCPs, or other approved local, regional, or State HCPs, would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact BIO-5: Have the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction and Operation

As described in Impacts BIO-1a, BIO-1b, and BIO-2, implementation of the projected forecasted development pattern, sea level rise adaptation projects, and transportation projects under the proposed plan could adversely affect special-status species and sensitive natural communities. The degree to which plan implementation could jeopardize a special-status species or sensitive natural community by substantially reducing the abundance, distribution, or viability of the species or natural community is unknown. However, because of their declining status, special-status species and sensitive natural communities are considered the most vulnerable to potential loss of viability. This impact would be potentially significant (PS).

Common species and habitats in the plan area are relatively abundant and generally adapted to the types and magnitude of disturbances expected under the proposed plan; therefore, plan implementation is not expected to substantially reduce the abundance or distribution of any common species or habitat.

Conclusion

Because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to result in land use changes and localized effects that could directly affect special-status species or sensitive natural communities this impact would be **potentially significant (PS)**. Mitigation Measure BIO-5 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure BIO-5 Implementing agencies and/or project sponsors shall implement the following measures (or other equally effective measures), where feasible and as applicable based on project- and site-specific considerations:

- Implement Mitigation Measures BIO-1(a), BIO-1(b), BIO-2, and BIO-3(a).

Significance after Mitigation

To the extent that a local agency requires an individual project to implement all feasible and applicable mitigation measures described above, the impact would be less than significant with mitigation (LTS-M), for the same reasons described previously for implementation of Mitigation Measures BIO-1(a), BIO-1(b), BIO-2, and BIO-3(a), which would reduce impacts on special-status plants and wildlife, critical habitat, State- and federally protected wetlands, wildlife movement corridors, and wildlife nursery sites.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Although Mitigation Measures BIO-1(b) and BIO-2 are directly tied to existing regulations that are law and binding on responsible agencies and project sponsors, they would not apply to all areas considered sensitive natural communities. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

3.6 CLIMATE CHANGE, GREENHOUSE GASES, AND ENERGY

This section evaluates the potential impacts related to greenhouse gas (GHG) emissions resulting from implementation of the proposed plan and analyzes their potential contribution to global climate change. For information on the proposed plan's discussion of sea level rise, please see Chapter 2, "Project Description." Additionally, this section evaluates the potential impacts related to energy consumption resulting from the implementation of the proposed plan.

Comments received in response to the Notice of Preparation expressed concerns regarding sea level rise adaptation and its relation to shoreline community and ecosystem protection and mobile-source GHG emissions. Comments also requested inclusion of sustainable transportation alternatives to highway capacity that do not induce vehicle miles traveled (VMT) and GHG emissions and consideration of the San Francisco Bay Conservation and Development Commission's (BCDC's) recently adopted (December 2024) Regional Shoreline Adaptation Plan (RSAP) as required by Senate Bill (SB) 272 (Laird). These issues are addressed in this section.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require they be considered. Consistent with these requirements, the comments received on the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.6.1 Environmental Setting

GREENHOUSE GASES

The Physical Scientific Basis of Greenhouse Gas Emissions and Climate Change

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected toward space. The absorbed radiation is then emitted from the earth as low-frequency infrared radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are CO_2, methane, nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Human-caused emissions of these GHGs in excess of natural ambient concentrations are found to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is very likely that human-induced GHG increases were the main driver of tropospheric warming since comprehensive satellite observations started in 1979, and virtually certain that the human-induced GHG increase is the primary driver of the observed changes in hot and cold extremes on the global scale (IPCC 2023).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas most pollutants with localized air quality effects have relatively short atmospheric lifetimes (approximately 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere long enough to be dispersed around the globe. Although the lifetime of any GHG molecule depends on multiple variables and cannot be determined with any certainty, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration.

The quantity of GHGs in the atmosphere responsible for climate change is not precisely known, but it is considered to be enormous. No single project alone would measurably contribute to an incremental change in the global average temperature or to global or local climates or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

Greenhouse Gas Emissions Sources and Sinks

Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices, landfills, and forest fires. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water) and are two of the most common processes for removing CO_2 from the atmosphere.

Effects of Climate Change on the Environment

The Intergovernmental Panel on Climate Change (IPCC) predicts that the global mean surface temperature increase (2081–2100) could range from 0.5 to 8.7 degrees Fahrenheit (°F) by the end of the 21st century, relative to 1986–2005. Additionally, IPCC projects that global mean sea level rise will continue during the 21st century, very likely at a faster rate than observed from 1901 to 2015. By 2100, the rise will likely range from 11 to 22 inches (0.28 to 0.55 meters) (IPCC 2023).

According to *California's Fourth Climate Change Assessment*, with global GHGs reduced at a moderate rate, California will experience average daily high temperatures that are warmer than the historic average by 2.5°F from 2006 to 2039, by 4.4°F from 2040 to 2069, and by 5.6°F from 2070 to 2100; if GHG emissions continue at current rates, California will experience average daily high temperatures that are warmer than the historic average by 2.7°F from 2006 to 2039, by 5.8°F from 2040 to 2069, and by 8.8°F from 2070 to 2100 (LCI et al. 2018, formerly OPR et al.).

Since its previous climate change assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012 to 2016, an almost nonexistent Sierra Nevada winter snowpack in 2014-2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures (LCI et al. 2018). According to California Natural Resource Agency's *Safeguarding California Plan: 2018 Update*, California experienced the driest 4-year statewide precipitation on record from 2012 through 2015; the warmest years on average in 2014, 2015, and 2016; and the smallest and second-smallest Sierra snowpack on record in 2015 and 2014 (CNRA 2018). The year 2023 was the warmest year since global records began in 1850 at 1.18 degrees Celsius (°C) (or 2.12°F) above the 20th century average of 13.9°C (57.0°F). This value is 0.15°C (0.27°F) more than the previous record set in 2016. The year 2024 was the warmest year since global records began in 1850 at 1.29 degrees Celsius (°C, or 2.32°F) above the 20th century average of 13.9°C (57.0°F). This value is 0.10°C (0.18°F) more than the previous record set in 2023. The 10 warmest years in the 174-year record have all occurred during the last decade (2014–2024) (NOAA 2025). In contrast, the northern Sierra Nevada experienced one of its wettest years on record during the 2016/2017 water year (CNRA 2018).

These changes in precipitation exacerbate wildfires throughout California through a cycle of high vegetative growth coupled with dry, hot periods, which lowers the moisture content of fuel loads. As a result, the frequency, size, and devastation of forest fires have increased. In November 2018, the Camp Fire destroyed the town of Paradise in Butte County and caused 85 fatalities, becoming the State's deadliest fire in recorded history, and the largest fires in the State's history have occurred in the 2018–2020 period. In January of 2025, the Los Angeles area fires burned an area of approximately 50,000 acres, killing more than two dozen people, destroying over 15,000 homes and businesses, and creating unhealthy air quality for millions of people (Lindsey 2025). Moreover, changes in the intensity of precipitation events following wildfires can also result in devastating landslides. In January 2018, following the Thomas Fire, 0.5 inches of rain fell in 5 minutes in Santa Barbara causing destructive mudslides formed from the debris and loose soil left behind by the fire.

As temperatures increase, the amount of precipitation falling as rain rather than snow also increases, which could lead to increased flooding because water that would normally be held in the snowpack of the Sierra Nevada and the Cascade Range until spring would flow into the Central Valley during winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2018). Furthermore, in the extreme scenario involving the rapid loss of the Antarctic ice sheet and the glaciers atop Greenland, the sea level along California's coastline is expected to rise 54 inches by 2100 if GHG emissions continue at current rates (LCI et al. 2018).

Temperature increases and changes to historical precipitation patterns will likely affect ecological productivity and stability. Existing habitats may migrate from climatic changes where possible, and those habitats and species that cannot retreat will be severely threatened. Altered climate conditions will also facilitate the movement of invasive species to new habitats, thus potentially outcompeting native species. Altered climatic conditions dramatically endanger the survival of arthropods (e.g., insects, spiders), which could have cascading effects throughout ecosystems (Lister and Garcia 2018). Conversely, a warming climate may support the populations of other insects, such as ticks and mosquitos, which transmit diseases harmful to human health, such as the Zika virus, West Nile virus, and Lyme disease (António et al 2018).

Changes in temperature, precipitation patterns, extreme weather events, wildfires, and sea level rise have the potential to threaten transportation and energy infrastructure, crop production, forests and rangelands, and public health (CNRA 2018; LCI et al. 2018). The effects of climate change will also have an indirect adverse impact on the economy as more severe natural disasters cause expensive physical damage to communities and the State.

Greenhouse Gas Emission Sources

Per capita GHG emissions in California have dropped from a 2001 peak of 13.8 metric tons per person to 9.7 metric tons per person in 2021, a 30.0% decrease. In 2014, statewide GHG emissions dropped below the 2020 GHG limit and have remained below the limit since that time. In 2021, emissions from GHG emitting activities statewide were 381.3 million metric tons of carbon dioxide equivalent ($MMTCO_2e$). This is 12.6 $MMTCO_2e$ (3.4%) higher than 2020 (368.7 $MMTCO_2e$), but 23.1 $MMTCO_2e$ (5.7%) lower than 2019 levels (404.4 $MMTCO_2e$). Both the 2019 to 2020 decrease and the 2020 to 2021 increase in emissions are likely due in large part to the impacts of the Covid-19 pandemic that were felt globally. Emissions levels in 2020 are anomalous to the long-term trend, and the 1-year increase from 2020 to 2021 should be considered in the broader context of the pandemic and subsequent economic recovery that took place over 2021. In 2022, emissions from statewide emitting activities were 371.1 million $MMTCO_2e$, 10.2 $MMTCO_2e$ lower than 2021 levels and 59.9 $MMTCO_2e$ below the 2020 GHG limit of 431 $MMTCO_2e$ (EPA 2024). Overall trends in the Assembly Bill (AB) 32 (Global Warming Solutions Act of 2006 to reduce GHG emissions to 1990 levels by 2020) GHG inventory also continue to demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product) is declining.

As discussed previously, GHG emissions are attributable in large part to human activities. **Table 3.6-1** summarizes the statewide GHG inventory for California; transportation, industry, and electricity generation are the largest GHG emission sectors.

Table 3.6-1: Statewide GHG Emissions by Economic Sector (2022)

Sector	Percent
Transportation	39
Industrial	23
Electricity generation (in State)	11
Electricity generation (imports)	5
Agriculture	8
Residential	8
Commercial	6
Not specified	<1

Note: GHG = greenhouse gas.
Source: CARB 2024a.

Local and regional agencies in the Bay Area have taken steps to measure, quantify, evaluate, and mitigate their contributions to GHG emissions and global climate change. For example, 89 cities and counties in the Bay Area have developed their own climate action plans (CAPs), and 105 have completed GHG emissions inventories. Additionally, many cities, businesses, and municipal agencies are voluntary members of the Climate Action Registry, a private nonprofit organization originally formed by the State of California that serves as a voluntary GHG registry to protect and promote early actions to reduce GHG emissions by organizations.

In 2017, the Bay Area Air District (formerly the Bay Area Air Quality Management District [BAAQMD]) updated a baseline inventory of GHG emissions in the region for the year 2015 in the *2017 Clean Air Plan: Spare the Air, Cool the Climate*. According to that inventory, 86.6 $MMTCO_2e$ were emitted in the Bay Area in 2015 (BAAQMD 2017). **Table 3.6-2** and **Table 3.6-3** show the emissions breakdown by pollutant and source.

Table 3.6-2: 2015 Bay Area CO_2e Emissions by Pollutant

Pollutant	Percentage	CO_2e ($MMTCO_2e$/year)
Carbon Dioxide	90	78
Methane	3	3
Nitrous Oxide	2	2
HFC, PFC, SF6	5	4
Regional Total	100	87

Notes: CO_2e = carbon dioxide equivalent; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent; HFC = hydrofluorocarbon; PFC = perfluorocarbon; SF_6 = sulfur hexafluoride. Totals may not sum because of independent rounding.
Source: BAAQMD 2017: Table E.

Table 3.6-3: 2015 Bay Area CO_2e Emissions by Source

Source Category	Percentage	CO_2e ($MMTCO_2e$/year)
On- and Off-Road Transportation	40	35
Stationary Sources	24	21
Electricity/ Cogeneration[1]	18	16
Buildings[2]	11	10
Waste Management	3	2
High Global Warming Potential Gases	3	3
Agriculture	1	1
Regional Total	100	88

Notes: CO_2e = carbon dioxide equivalent; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent. Totals may not sum because of independent rounding.

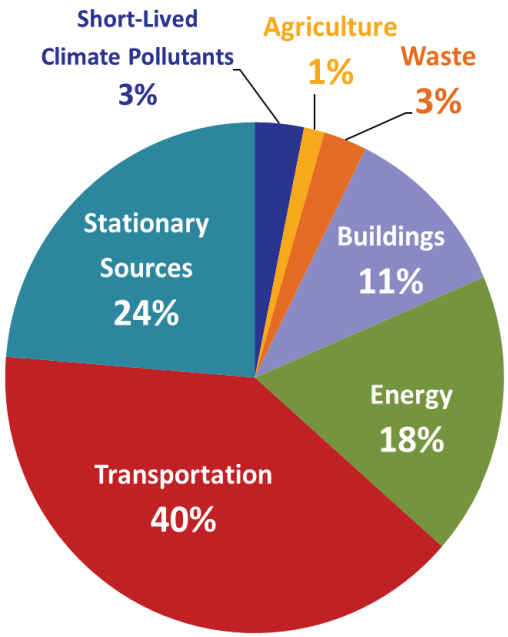
[1] Includes imported electricity emissions (2.7 $MMTCO_2e$).

[2] Residential and commercial fuel use, excluding electricity.

Source: BAAQMD 2017: Table F.

The Bay Area's transportation sector alone contributes 40% of the CO_2e GHG emissions, followed by stationary sources (e.g., oil refineries and stationary fuel usage) (24%), electricity generation and cogeneration (18%), buildings (11%), waste management (3%), high global warming potential gases (3%), and agriculture (1%). Bay Area emissions by sector are illustrated in **Figure 3.6-1**.

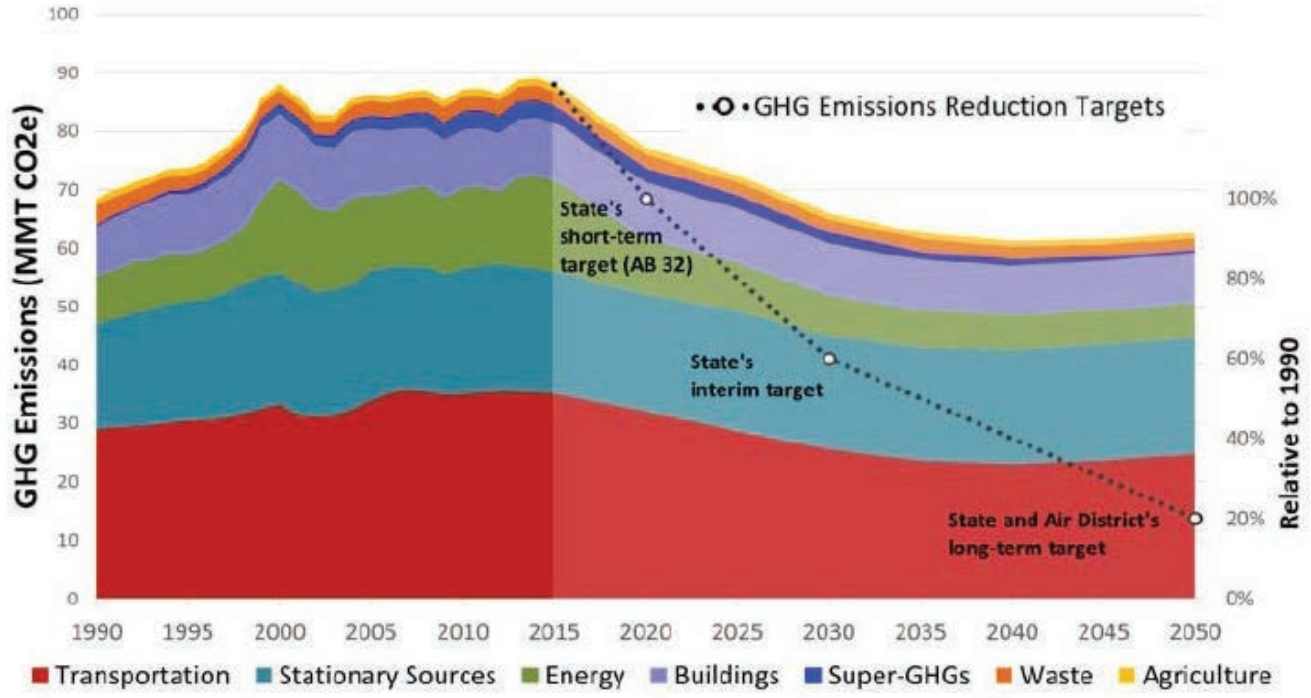
Figure 3.6-1: 2015 Bay Area Greenhouse Gas Emissions by Source, as a Percent of Total



Source: BAAQMD 2017: Figure 3-6.

Economic activity variations and the fraction of electric power generation in the region will cause year-to-year fluctuations in the emissions trends. Currently adopted policies and regulations would also affect future emission trends. **Figure 3.6-2** shows the emission trends and forecasts by major sources for the period of 1990–2050 alongside adopted GHG reduction targets.

Figure 3.6-2: Bay Area Greenhouse Gas Emissions Trends by Major Source from 1990 to 2050



Source: BAAQMD 2017: Figure 3-9.

Sea Level Rise

Historical Data

Sea levels began rising globally at the end of the last ice age more than 10,000 years ago (USGS 2011). The National Water Level Observation Network is a permanent observing system that includes 210 continuously operating water level stations throughout the United States and its territories (NOAA 2024). New satellite-based sensors are extending these measurements. The data indicate that the global mean sea level is rising at an increasing rate, and sea level rise is already affecting much of California's coastal region, including the San Francisco Bay and its upper estuary (the Sacramento–San Joaquin Delta). Water level measurements from the San Francisco Presidio gauge (CA Station ID: 9414290) indicate that the relative sea level trend is 1.98 millimeters per year (mm/yr) with a 95% confidence interval of ± 0.17 mm/yr based on monthly mean sea level data from 1897 to 2024, which is equivalent to a change of 0.65 feet in 100 years (NOAA 2024).

According to the IPCC Sixth Assessment Report (IPCC 2023):

> Global mean sea level has risen faster since 1900 than over any preceding century in at least the last 3000 years (high confidence). The global ocean has warmed faster over the past century than since the end of the last deglacial transition (around 11,000 years ago) (medium confidence). A long-term increase in surface open ocean pH occurred over the past 50 million years (high confidence). However, surface open ocean pH as low as recent decades is unusual in the last 2 million years (medium confidence).

Projected Climate Conditions

Global and regional climate models can be used to project the range of estimated sea level rise rates based on emission scenarios and climate simulations. Climate models continue to be developed and improved, and many models have been extended into Earth System models by including the representation of biogeochemical cycles important to climate change (IPCC 2014: 743). Global climate

models are based on well-established physical principles and have been demonstrated to reproduce observed features of recent climate and past climate changes. Global models provide information about climate response to various scenarios but usually at a low resolution that does not provide the level of detail needed to make planning decisions at a local level.

On a regional scale (subcontinental and smaller), the confidence in model capability to simulate surface temperature is less than for the larger scale; however, regional-scale surface temperature simulation has continued to improve since the release of the IPCC Fourth Assessment Report. A region-based model can provide an evaluation of climate processes that are unresolved at the global model scale. Region-based climate models that provide locally relevant climate information are based on model output from global models, and the scale and resolution of the region-based climate models vary widely depending on the original application and intent of the developed model.

Sea Level Rise Projections

IPCC projects that global mean sea level rise will likely range from 11 to 22 inches (0.28 to 0.55 meters) by 2100 relative to 1995–2014. Global sea levels are expected to continue to rise for centuries to millennia due to continuing deep-ocean warming and ice-sheet melt and to remain elevated for thousands of years. Over the next 2,000 years, global mean sea level will rise by about 2 to 3 meters if warming is limited to 1.5°C, 2 to 6 meters if limited to 2°C, and 19 to 22 meters with 5°C of warming (IPCC 2021).

Statewide guidance has also been issued by the California Ocean Protection Council (OPC) to help the region prepare for sea level rise. The *State of California Sea-Level Rise Guidance Document: 2018 Update* (OPC Guidance) offers a series of projections for the State using a set of probability distributions. The OPC Guidance used IPCC projections as a starting point and includes the emissions scenarios; however, the absence of local projections and a lack of probabilities led to more localized projection analysis. The OPC Guidance specifies the projections of Kopp et. al 2014 as the best available for California. California projections are measured by emissions, time, and risk aversion. For 2050, the sea level rise projections are all still considered to be in a high emissions timeframe and range from 1.1 feet as the low risk-averse choice, 1.9 feet as the medium-high risk-averse choice, and 2.7 feet as the extreme risk-averse choice. The OPC Guidance projection referenced in the proposed plan comes from the projection that there is a 1-in-200 chance of exceeding 1.9 feet by the year 2050, characterizing this projection as a medium-high risk averse choice (OPC 2018). **Figure 3.6-3** presents the approximate medium-high risk projections for the region, including 24 inches representing sea level rise inundation by 2050, and 83 inches, or 7 feet, representing the sea level rise inundation projected by 2100. For more information on the document, see Section 3.6.2, “Regulatory Setting.”

Sea Level Rise in San Francisco Bay

Overall sea level rise projections in the Bay Area were developed using two map sets. BCDC’s Adapting to Rising Tides program has developed county-specific analyses of sea level rise projects for the nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Mateo, San Francisco, Santa Clara, Solano, and Sonoma (BCDC 2021). Sea level rise projections for coastal areas outside of the San Francisco Bay were based on the National Oceanic and Atmospheric Administration (NOAA) Coastal Service Center’s sea level rise inundation maps for the San Francisco Bay Area in 2023. Both maps depict sea level rise relative to a mean higher high-water condition in the San Francisco Bay. **Table 3.6-4** presents NOAA and BCDC sea level rise inundation information with 24 inches of sea level rise based on the OPC Guidance for 2050.

Table 3.6-4: Projected Midcentury (2050) Sea Level Rise Inundation Zone by County

County	Areas Inundated by Sea Level Rise[1] (acres)	Total County Area[2] (million acres)	Percent Inundated
Alameda	13,660	471,973	3%
Contra Costa	3,606	458,814	1%
Marin	7,722	332,890	2%
Napa	2,428	481,264	1%
San Francisco	287	29,878	1%
San Mateo	12,991	287,117	5%
Santa Clara	3,858	826,293	0%
Solano	39,736	525,911	8%
Sonoma	10,152	1,008,215	1%
Regional Total	94,441	4,422,355	2%

Note: Based on 24 inches of sea level rise.

[1] Includes disconnected low-lying areas.

[2] Excludes existing bodies of water within county boundaries.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

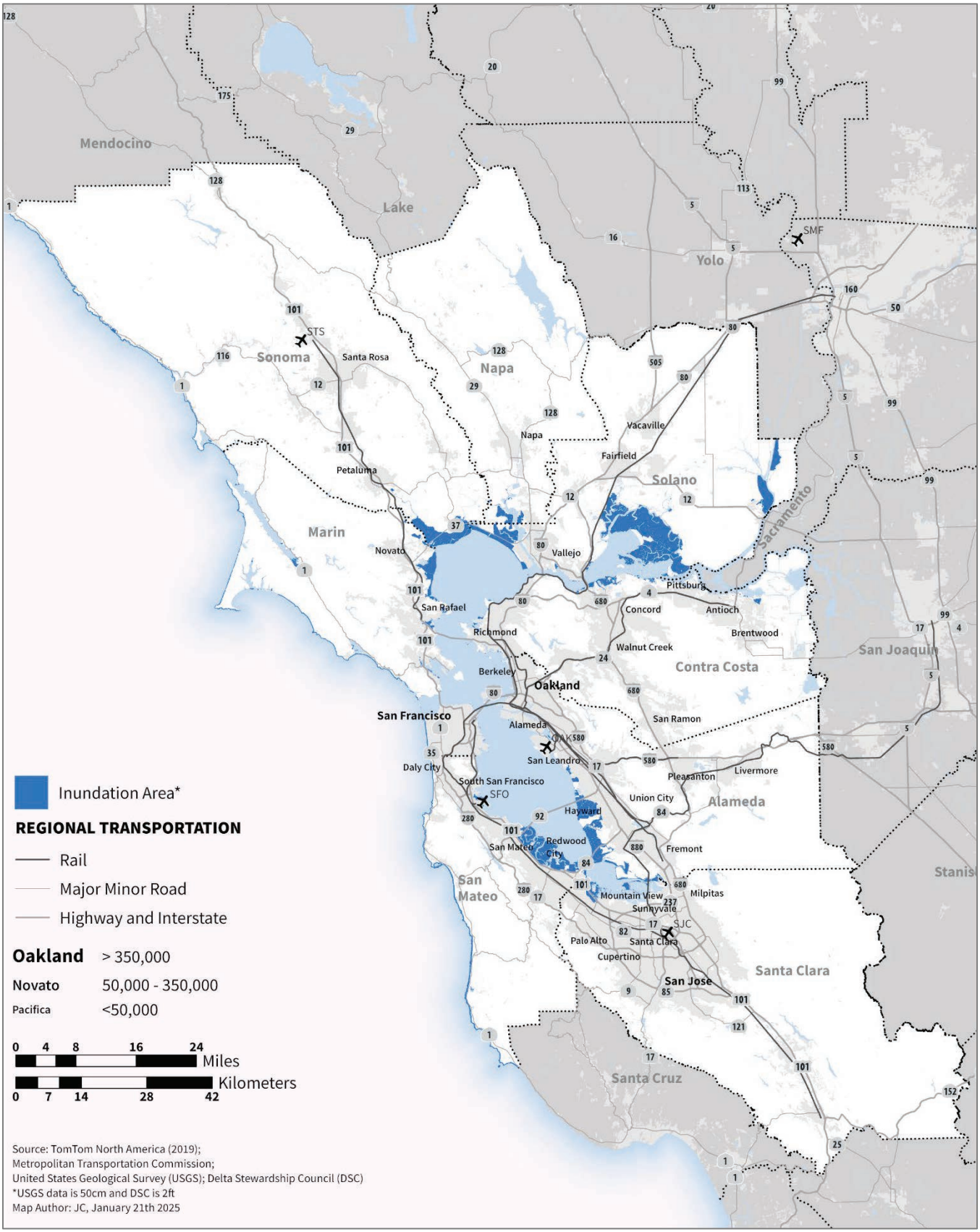
According to BCDC, sea level rise in the Bay Area presents a significant risk to the Baylands ecosystem, which consists of shallow water habitats around the San Francisco Bay between minimum and maximum tidal elevations, subtidal habitats, transition zones, and adjacent uplands and associated flora and fauna. As sea levels continue to rise and flooding events become more common, the Bayland ecosystem will face increasing habitat degradation as existing habitats in the Baylands are continuously inundated (BCDC 2024).

Air Quality and Public Health

The negative effects of climate change on air quality in the Bay Area will affect public health, largely through increasing levels of ozone and fine particulate matter (PM). These pollutants will increase through emissions from wildfires and more frequent and longer-lasting heat waves. The health effects of exposure to both ozone and PM have historically been primarily associated with respiratory ailments, such as asthma and bronchitis. However, many epidemiological studies have also been published linking exposure to these pollutants, especially PM, with serious cardiovascular illness, including arteriosclerosis, strokes, and heart attacks, all of which can cause premature death (Raun and Ensor 2012).

Exposure to higher levels of ozone and fine PM tend to disproportionately affect the more vulnerable people in a population: children, the older people, and people with impaired health. In addition, many people affected by poor air quality are also subject to socioeconomic conditions that make them less able to prepare for and cope with these effects of climate change.

Figure 3.6-3: 24-Inch Sea Level Rise at Mean Higher High Water



Source: TomTom North America 2019.

Wildfires

Climate change is expected to increase the frequency and severity of wildfires in California by altering precipitation and wind patterns, changing the timing of snowmelt, and inducing longer periods of drought. In addition to the direct threat to human life and property, wildfires emit huge quantities of fine particles, such as black carbon, and can cause dramatic short-term spikes in pollution levels, greatly increasing population exposure to PM and other harmful pollutants.

Wildfires release immense quantities of CO_2 stored in trees and vegetation into the atmosphere. Therefore, to the extent that climate change increases wildfires, this effect will increase atmospheric concentrations of GHGs that contribute to climate change, establishing a feedback loop. See Section 3.9, "Hazards and Wildfire," for more information related to wildfire risks and the consequences of development in recognized fire hazard zones.

As stated in Section 3.9, climate change is expected to continue to produce conditions that facilitate a longer fire season, which, when coupled with human-caused changes in the seasonality of ignition sources, will produce more, longer, and bigger fires during more times of the year. As stated in Section 3.9, if GHG emissions continue to rise, the frequency of extreme wildfires burning more than 25,000 acres could increase by 50% by 2100, and the average area burned statewide could increase by 77% by the end of the century. In 2017, the Tubbs Fire caused substantial destruction in parts of Napa and Sonoma Counties. Believed to have been started by a private electrical system, the fire is the second-most destructive in recent California history. In 2020, several large fires occurred in California as a result of lightning storms coupled with dry fuels. Currently the third-largest fire in recent California history, the SNU Lightening Complex fires, burned 396,624 acres in Stanislaus, Santa Clara, Alameda, Contra Costa, Santa Cruz, and San Joaquin Counties in August 2020. At the same time, the LNU Lightening Complex fire burned an additional 363,200 acres in Sonoma, Lake, Napa, and Yolo Counties. January of 2025, the Los Angeles area fires burned a total area of approximately 50,000 acres, killing more than two dozen people, destroying over 15,000 homes and businesses, and creating unhealthy air quality for millions of people (CAL FIRE 2025; Lindsey 2025).

Heat

Rising temperatures attributable to climate change are likely to have negative effects on air quality and public health in the Bay Area. Ground-level ozone—the primary component of smog—is formed through photochemical reactions among precursor pollutants. The most important of these precursor pollutants are oxides of nitrogen and volatile organic compounds (VOCs). Higher temperatures lead to greater evaporative emissions of VOCs from sources such as fuel storage tanks and motor vehicle fuel tanks, as well as greater emissions of VOCs from biogenic sources, such as trees and vegetation. Increased demand for electricity to power air conditioners can also lead to higher emissions of ozone precursors from power plants. In addition to greater emissions of ozone precursors, ozone levels are also expected to increase because ozone formation is highly temperature sensitive, increasing rapidly as temperatures rise above 90°F. As the Bay Area experiences more extreme heat days, with higher temperatures during both the days and the evenings, higher ozone levels will make it more difficult for the region to attain and maintain air quality standards.

Increasing amounts of ground-level ozone pose a threat to human health. Breathing ozone can trigger a variety of health problems, such as asthma, bronchitis, impacts on lung function, and chest pains. Recent studies have linked premature death to even short-term exposure to ozone (EPA 2025). The *Safeguarding California Plan* highlights those who are most vulnerable to health impacts, such as young children, the older people, and pregnant people, and acknowledges that these people also may experience systemic, preventable differences in health status, called health inequities. These communities include people with lower incomes, some communities of color, people with existing health conditions, people experiencing homelessness, outdoor workers, incarcerated people, immigrants, and tribal communities (CNRA 2018). According to a 2011 report by the Union of Concerned Scientists, increases in ozone levels induced by climate change in California could result in nearly 443,000 additional cases of serious respiratory illnesses (Union of Concerned Scientists 2011).

As previously stated, 2024 was the warmest year since global records began in 1850 at 1.29 °C (2.32°F) above the 20th century average of 13.9°C (57.0°F). The 10 warmest years in the 174-year record have all occurred during the last decade (2014–2024) (NOAA 2025). In contrast, the northern Sierra Nevada experienced one of its wettest years on record during the 2016/2017 water year (CNRA 2018). As temperatures increase, the amount of precipitation falling as rain rather than snow also increases, which could lead to increased flooding because water that would normally be held in the snowpack of the Sierra Nevada and the Cascade Range until spring would flow into the Central Valley during winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2018). Furthermore, in the extreme scenario involving the rapid loss of the Antarctic ice sheet and the glaciers atop Greenland, the sea level along California's coastline is expected to rise 54 inches by 2100 if GHG emissions continue at current rates (LCI et al. 2018). Temperature increases and changes to historical precipitation patterns will likely affect ecological productivity and stability. Existing habitats may migrate from climatic changes where possible, and those habitats and species that cannot retreat will be severely threatened.

ENERGY

Energy Types and Sources

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. One-third of energy commodities consumed in California is natural gas. In 2024, renewable resources, including hydroelectric power and small-scale solar power, supplied 57% of California's in-state electricity generation. Natural gas fueled another 35% and nuclear power provided almost all the rest (EIA 2025).

Pacific Gas and Electric Company (PG&E) is the primary electricity and natural gas service provider in the Bay Area, North Coast, and Central Valley areas of the State. In 2023, 33% of PG&E's base power plan's electricity was generated by eligible renewable energy resources, as defined by the California Energy Commission (CEC) (i.e., biomass combustion, geothermal, small-scale hydroelectric, solar, and wind); 53% by nuclear generation, and 13% by large-scale hydroelectric resources gas (CEC 2024a). PG&E also offers its customers 50% and 100% solar choice options, which are 69% and 100% renewable, respectively.

Alternative Fuels

A variety of alternative fuels are used to reduce demand for petroleum-based fuel. The use of these fuels is encouraged through various statewide regulations and plans (e.g., Low Carbon Fuel Standard, AB 32 Scoping Plan). Conventional gasoline and diesel may be replaced (depending on the capability of the vehicle) with many transportation fuels, including:

- biodiesel,
- electricity,
- ethanol (E-10 and E-85),
- hydrogen,
- natural gas (methane in the form of compressed and liquefied natural gas),
- propane,
- renewable diesel (including biomass-to-liquid),
- synthetic fuels, and
- gas-to-liquid and coal-to-liquid fuels.

California has a growing number of alternative fuel vehicles through the joint efforts of CEC, the California Air Resources Board (CARB), local air districts, federal government, transit agencies, utilities, and other public and private entities. As of December 2023, California contained over 60,200 alternative fueling stations (AFDC 2025).

Commercial and Residential Energy Use

Homes in the United States built between 2000 and 2005 used 14% less energy per square foot than homes built in the 1980s and 40% less energy per square foot than homes built before 1950. However, larger home sizes offset these efficiency improvements. Primary energy consumption in the residential sector totaled 9.5 quadrillion British thermal units (Btu) in 2020 (the latest year the US Energy Information Administration's [EIA's] *Residential Energy Consumption Survey* was completed) (EIA 2024). Energy consumption increased 4.4% from 2015 to 2020. (EIA 2024).

Commercial buildings represent just under one-fifth of US energy consumption, with office space, retail space, and educational facilities representing about half of commercial sector energy consumption. The commercial sector accounted for 8% of total energy in the United States in 2023. In comparison, the residential sector accounted for approximately 7% of US energy consumption (EIA 2024).

Commercial and residential space heating (including on-site cogeneration facilities at commercial buildings) makes up a large share of energy end use in the Bay Area. Other major energy users include industrial facilities (including oil refineries that consume energy in the production of gasoline and other fuels) and electricity-generating power plants, which burn fossil fuels (generally natural gas) to convert those fuels to electricity.

Electricity and natural gas consumption for the nine Bay Area counties in 2022 is shown in **Table 3.6-5**.

Table 3.6-5: Electricity and Natural Gas Consumption in the San Francisco Bay Area in 2022

County	Electricity (GWh)	Natural Gas (million therms)
Alameda	10,395	377
Contra Costa	8,337	894
Marin	1,293	66
Napa	1,029	38
San Francisco	5,120	214
San Mateo	4,177	204
Santa Clara	17,101	423
Solano	3,255	248
Sonoma	2,880	107
Regional Total	53,587	2,571

Note: GWh = gigawatt hours.
Source: CEC 2025.

Energy Use for Transportation

The transportation sector uses about 86% of the petroleum consumed in the state. The industrial sector accounts for about 10% of state petroleum use, and the commercial sector consumes about 3%. The residential sector, uses about 1%. A small amount of petroleum is used for electricity generation (EIA 2025). On-road vehicle use makes up about 90% of the petroleum consumed in California. CEC reported retail sales of approximately 1.9 billion and 175 million gallons of gasoline and diesel, respectively, in the Bay Area's nine counties in 2023 (the most recent data available) (CEC 2025).

Vehicle Miles Traveled and Gasoline Consumption

According to EIA, in the 20-year period between 2003 and 2023, statewide motor gasoline consumption decreased by 16% (EIA 2025). According to Caltrans, in the same period, statewide VMT has decreased by 2%. However, currently, VMT across the United States and California is trending upward. Prior to the Covid-19 pandemic, total and per capita VMT were increasing in California. While VMT decreased sharply during the pandemic, it has since rebounded returning to pre-pandemic levels. To meet the State's climate goals, daily per capita VMT must decrease to 17.2 by 2045 (a 29% reduction from 2001 levels) (Caltrans 2023).

As noted in Section 3.6.2, "Regulatory Setting," below, several State mandates and efforts, such as Senate Bill (SB) 375 and SB 743, seek to reduce VMT. Despite the progress in reducing per capita VMT and per capita fuel consumption, the continued projected increases in total fuel consumption and VMT can be attributed to the overall forecasted increase in population; see Section 3.15, "Transportation," for more information on VMT and other travel-related data for the Bay Area, including the effects of the proposed plan.

Total gasoline use in California varies from year to year because of a variety of factors, such as gas prices, periods of economic growth and decline, and fuel economy of vehicles. Between January 2015 and December 2024, approximately 143 billion gallons of gasoline were purchased in California. During this period, the volume of gasoline purchased ranged from a minimum of approximately 710 million gallons in April 2020 due to the effects of Covid-19, to a maximum of approximately 1.51 billion gallons in July 2019 (California Department of Tax and Fee Administration 2025).

Long-term energy consumption trends for transportation are generally determined by fuel efficiency trends for motor vehicles because motor vehicles are the predominant transportation mode for passengers and commercial goods.

Energy Used by Public Transit

Public transit energy consumption includes energy consumed for the operation of public buses, electrified and diesel rail systems, and ferries.

The energy efficiency of each of these modes may vary according to operating conditions and ridership. For example, if a ferry that uses 1.256 million Btu per mile carries 400 passengers on a trip, the energy use is approximately 3,140 Btu per passenger mile, while a bus carrying 30 passengers consumes 37,310 Btu per mile, which equates to about 1,245 Btu per passenger mile.

Energy Used by Private and Commercial Vehicles

Commercial vehicles, generally composed of light, medium, and heavy trucks, are typically fueled by diesel or gasoline and are part of the general fleet mix of vehicles present within the Bay Area transportation system.

3.6.2 Regulatory Setting

FEDERAL

Greenhouse Gas

There is no overarching federal law specifically related to climate change or the reduction of GHG emissions. Additionally, in March 2025, the current administration announced that EPA will undertake 31 actions, focusing primarily on reconsidering practices adopted by previous administrations, including numerous actions and regulations related to climate change and the reduction of GHG emissions. These include, but are not limited to, reconsideration of regulations on power plants, the Mandatory Reporting Rule, the

Endangerment Finding, and fuel economy standards, among others. As of the writing of this Draft EIR, none of these regulations have been repealed or replaced . Therefore, these regulations are discussed below.

Massachusetts v. Environmental Protection Agency

In *Massachusetts et al. v. Environmental Protection Agency et al.*, 549 US 497 (2007), the Supreme Court of the United States ruled that CO_2 is an air pollutant as defined under the federal Clean Air Act (CAA) and that the US Environmental Protection Agency (EPA) has the authority to regulate GHG emissions. In 2010, EPA started to address GHG emissions from stationary sources through its New Source Review permitting program, including operating permits for "major sources" issued under Title V of the CAA.

Endangerment Finding and Cause or Contribute Finding

On December 7, 2009, the EPA administrator signed two distinct findings regarding GHGs under CAA Section 202(a) (42 US Code Section 7521).

Endangerment Finding: The administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, methane, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. On July 29, 2025, EPA announced a proposal to rescind the Endangerment Finding and repeal all GHG emission standards for light-duty, medium-duty, and heavy-duty vehicles and engines pursuant to CAA section 202(a). The proposed rule would remove GHG-related provisions from 40 CFR part 600 without affecting provisions related to CAFE standards and fuel economy labeling. In general, the proposed rule would remove model year (MY) 2012 and later GHG emission standards for passenger cars and light trucks, and MY 2014 and later GHG emission standards for medium-duty vehicles. As of writing this EIR, EPA has not adopted this proposal. For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis."

Mandatory Reporting Rule

EPA adopted a mandatory GHG reporting rule in September 2009. The rule requires suppliers of fossil fuels or entities that emit industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of GHG emissions to submit annual reports to EPA beginning in 2011. Vehicle and engine manufacturers were required to begin reporting GHG emissions starting with MY 2011.

Federal Clean Air Act

The CAA of 1970, amended in 1977 and 1990 (42 US Code 7506[c]), was enacted for the purposes of protecting and enhancing the nation's air resources to benefit public health. In 1971, the CAA required EPA to set national ambient air quality standards that establish emission limits for certain pollutants. In 2009, EPA signed two findings related to GHGs. First, EPA found that current and projected concentrations of CO_2, methane, N_2O, HFCs, PFCs, and SF_6 would threaten public health and the welfare of current and future generations. Second, EPA found that mobile vehicles contribute to GHG pollution, which threatens public health and welfare (EPA 2009).

Global Change Research Act (1990)

In 1990, Congress passed and the president signed Public Law 101-606, the Global Change Research Act. The purpose of the legislation was "to require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions toward international protocols in global change research, and for other purposes." To that end, the Global Change Research Information Office was established in 1991 to serve as a clearinghouse of information. The act requires a report to Congress every 4 years on the environmental, economic, health, and safety consequences of climate change; however, the first *National Assessment on Climate Change* (NCA1) was not published until 2000. Subsequent assessments were released in 2009 and 2014, with NCA4 released

in separate volumes in 2017 and 2018. In February 2004, operational responsibility for the Global Change Research Information Office shifted to the US Climate Change Science Program.

Public Law No. 119-16

On June 12, 2025, Public Law No. 119-16, enacting House Joint Resolution 88, became law. The law relied on the Congressional Review Act to disapprove the EPA's December 2024 waiver under the CAA that allowed California to implement and enforce the Advanced Clean Cars II (ACC II) regulation. ACC II included a zero-emission vehicle (ZEV) mandate targeting 100% new light-duty ZEV sales by 2035. P.L. No. 119-16 marks the first ever occurrence that waivers under the CAA have been revoked under the Congressional Review Act. The implications of this law on the State's capability to enforce its independent fuel economy standards are uncertain at this time, as the California Attorney General filed a lawsuit challenging P.L. No. 119-16 on June 12, 2025. The lawsuit is pending. For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis."

Public Law No. 119-17

Public Law 119–17, enacted under the Congressional Review Act on June 12, 2025, disapproves of the EPA's rule titled "California State Motor Vehicle and Engine and Nonroad Engine Pollution Control Standards; The 'Omnibus' Low NOX Regulation; Waiver of Preemption; Notice of Decision," (LowNO_x rule), which would have granted California a waiver to enforce stricter emissions standards for both on-road and non-road heavy-duty engines. Similar to the other Congressional Review Act resolutions listed above targeting emissions waivers, this law prohibits the EPA from reissuing the same or substantially similar rules without new authorization from Congress. The law effectively blocks California, and any states following its standards, from implementing the Low-NO_X rule. The implications of this law on the State's capability to enforce its low NO_X rule are uncertain at this time, as the California Attorney General filed a lawsuit challenging P.L. No. 119-17 on June 12, 2025, which is currently pending.

For details regarding the methods by which this analysis accounts for these regulatory actions in estimating mobile source emissions, see "Method of Analysis" in Section 3.4.3, "Impact Analysis." Energy

Fuel Economy Standards

The National Highway Traffic Safety Administration (NHTSA) and EPA set the Corporate Average Fuel Economy Standards (CAFE) standards to improve the average fuel economy and reduce GHG emissions generated by cars and light-duty trucks.

In 2024, CAFE standards were finalized for MYs 2027 through 2031. The final rule establishes standards that require an industry-wide fleet average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks. The final rule establishes standards that would require an industry-wide fleet average of approximately 50.4 mpg in MY 2031 for passenger cars and light trucks and an industry fleet-wide average for heavy-duty pickup trucks and vans (HDPUVs) of an estimated 2.851 gallons per 100 miles in MY 2035. The final CAFE standards increase at a rate of 2% per year for passenger cars in MYs 2027–2031 and 2% per year for light trucks in MYs 2029–2031. The final HDPUV fuel efficiency standards increase at a rate of 10% per year in MYs 2030–2032 and 8% per year in MYs 2033–2035 (NHTSA 2024).

Heavy-Duty Vehicle Program

EPA and NHTSA also set fuel efficiency and GHG standards for medium- and heavy-duty trucks. In 2011, EPA and NHTSA finalized a joint rule that established a national program to reduce GHG emissions and improve fuel economy for new medium- and heavy-duty engines and vehicles. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in MYs 2014–2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which require fuel efficiency standards for engines in MYs 2018–2027 (EPA 2016).

Executive Orders

There are several federal executive orders (EOs) related to energy production, renewable energy, and energy reduction.

EO 13834: Efficient Federal Operations

EO 13834 designates a federal chief sustainability officer to head an Office of Federal Sustainability along with chief sustainability officers to head each agency and report to the chair of the Council on Environmental Quality regarding implementation of sustainability goals.

EO 14154: Unleashing American Energy

EO 14154 declares a national energy emergency per the National Emergencies Act. Under this pretense, EO 14154 directs agencies to use their statutory emergency powers to expedite development and authorization of energy projects, defined in the order as "crude oil, natural gas, lease condensates, natural gas liquids, refined petroleum products, uranium, coal, biofuels, geothermal heat, the kinetic movement of flowing water, and critical minerals." EO 14154 does not apply to solar, wind, battery electric, or other energy sources not contained in the definition of "energy."

EO 14156: Declaring a National Energy Emergency

EO 14156 directs the heads of executive departments and agencies to identify and exercise any lawful emergency authorities available to them, as well as all other lawful authorities they may possess, to facilitate the identification, leasing, siting, production, transportation, refining, and generation of domestic energy resources, on, but not limited to, federal lands. If an agency determines that use of either federal eminent domain authorities or authorities afforded under the Defense Production Act (Public Law 81-774, 50 USC Section 4501 et seq.) are necessary to achieve this objective, the agency is directed to submit recommendations for a course of action to the president through the assistant to the president for national security affairs.

EO 14260: Protecting American Energy from State Overreach

EO 14260 aims to remove what the administration characterizes as "illegitimate impediments to the identification, development, siting, production, investment in, or use of domestic energy resources—particularly oil, natural gas, coal, hydropower, geothermal, biofuel, critical mineral, and nuclear energy resources." EO 14260 directs "[t]he Attorney General, in consultation with the heads of appropriate executive departments and agencies, [to] identify all State and local laws, regulations, causes of action, policies, and practices…burdening the identification, development, siting, production or use of domestic energy resources," prioritizing State laws "purporting to address 'climate change' or involving 'environmental, social, and governance' initiatives, 'environmental justice,' carbon or 'greenhouse gas' emissions, and funds to collect carbon penalties or carbon taxes" (White House 2025).

EO 14261: Reinvigorating America's Beautiful Clean Coal Industry and Amending Executive Order 14241

EO 14261 mandates the chair of the National Energy Dominance Council to entitle coal to the same benefits as other minerals (including the newly added uranium, copper, potash, and gold) designated in EO 14241, and calls upon multiple agencies (including the Department of State, Treasury, Interior, Energy, Agriculture, Labor, and Commerce, EPA, the Office of the US Trade Representative, the United States International Development Finance Corporation, and Export-Import Bank, among others) to support domestic coal production.

EO 14262: Strengthening the Reliability and Security of the United States Electric Grid

During periods when the relevant grid operator forecasts that a temporary interruption of electricity supply is necessary to prevent a complete grid failure, EO 14262 directs the secretary of energy, in consultation with executive department and agency heads as the secretary of energy deems appropriate, to the

maximum extent permitted by law, to streamline, systemize, and expedite the Department of Energy's processes for issuing orders under Section 202(c) of the Federal Power Act during the periods of grid operations described above, including the review and approval of applications by electric generation resources seeking to operate at maximum capacity.

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 established nationwide fuel economy standards to conserve oil. Pursuant to this act, the National Highway Traffic and Safety Administration, part of the US Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle economy standards.

Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, State, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAct. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce US dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change. The Energy Independence and Security Act of 2007 increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly fivefold increase over current levels, and reduces US demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020—an increase in fuel economy standards of 40%.

By addressing renewable fuels and the CAFE standards, the Energy Independence and Security Act of 2007 builds upon progress made by the Energy Policy Act of 2005 in setting out a comprehensive national energy strategy for the 21st century.

STATE

Greenhouse Gas

Statewide GHG Emission Targets and Climate Change Scoping Plan

Reducing GHG emissions in California has been the focus of the State government for approximately 2 decades. GHG emission targets established by the State legislature include reducing statewide GHG emissions to 1990 levels by 2020 (AB 32 of 2006) and reducing them to 40% below 1990 levels by 2030 (SB 32 of 2016). EO S-3-05 calls for statewide GHG emissions to be reduced to 80% below 1990 levels by 2050. This target was superseded by AB 1279 in 2022, which codifies a goal for carbon neutrality and reduction of emissions by 85% below 1990 levels by 2045. These targets are in line with the scientifically established levels needed in the United States to limit the rise in global temperature to no more than 2°C, the warming threshold

at which major climate disruptions, such as super droughts and rising sea levels, are projected; these targets also pursue efforts to limit the temperature increase even further to 1.5°C (United Nations 2015).

CARB adopted the *Final 2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan) on December 16, 2022, which traces the State's pathway to achieve a no net increase in emission and an 85% reduction from anthropogenic 1990 emissions goal by no later than 2045 using a combined top-down, bottom-up approach under various scenarios. It identifies the reductions needed by each GHG emission sector (e.g., transportation [including off-road mobile source emissions], industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential, and recycling and waste) to achieve these goals.

California State Priority Climate Action Plan

California's State Priority Climate Action Plan (PCAP), as funded by EPA's Climate Pollution Reduction Grants (CRPG) Program, was developed to achieve GHG reductions across the geographic extent of California from nearly every economic sector. The PCAP includes several elements: a 2021 statewide GHG emissions inventory; the State's overarching GHG targets codified by AB 32 and AB 1279; an overview of the State's approach to low-income and disadvantaged community benefits analysis; workforce considerations; and GHG reduction measures that target reductions in the transportation, industrial, energy, high GWPs, agriculture, natural and working lands, and waste sectors. The PCAP was developed to support statewide GHG reduction targets through implementation of the following reduction measures.

- **Transportation measures:**
  - create a holistic, heavy-duty zero-emissions vehicle buydown program;
  - install truck charging to support zero-emissions goods movement at California ports and warehouse districts;
  - advance the deployment of clean off-road equipment;
  - bolster investments in the State's sustainable port and freight infrastructure;
  - support mobility projects uplifted by communities; and
  - allow for local deployment of ZEV infrastructure and low-income ZEV support.
- **Industrial measure:**
  - accelerate industrial decarbonization by expanding the existing industrial decarbonization and improvement to grid operations program.
- **Energy measures:**
  - expand decarbonization through the Energy Conservation Assistance Act,
  - create a funding program to upgrade the capacity of distribution systems,
  - expand the success of California's Self-Generation Incentive Program for behind the meter energy storage,
  - bolster healthy landscapes and resilient communities through expanding the Biomass to Carbon Negative Biofuels Program,
  - deploy equitable building decarbonization,
  - implement bioenergy projects, and
  - enable renewable microgrids for rural communities and tribes.

- **High global warming potential cases measure:**
  - expand F-gas Reduction Incentive Program.
- **Agriculture measures:**
  - expand California's healthy soils practices, and
  - reduce methane emissions by expanding California's existing Dairy Digester Research and Development Program.
- **Natural and working lands measures:**
  - bolster California's Forest Health Program,
  - expand urban and community forest projects, and
  - expand the State's Wetland Restoration Program.
- **Waste measures:**
  - establish a Food Waste Prevention and Edible Food Recovery Program, and
  - bolster organics recycling infrastructure.

The PCAPs were to be submitted to EPA on or before March 1, 2024 (April 1 for Tribal Nations) (CARB 2024b). Entities that received funding under the CRPG must now complete the Comprehensive Climate Action Plan (CCAP), which is due in Fall 2025. The CRPG program will then track the efficacy of the CCAPs in a status report in 2027.

Sustainable Freight Action Plan

The Sustainable Freight Action Plan (SFAP) establishes clear targets to improve freight efficiency, transition to zero-emission technologies, and increase the competitiveness of California's freight system. The SFAP was developed by several State agencies and is a recommendation document that integrates investments, policies, and programs across several State agencies to help realize a singular vision for California's freight transport system. The SFAP recommends a high-level vision and broad direction to the governor to consider for State agencies to use when developing specific investments, policies, and programs related to the freight transport system that serves California's transportation, environmental, and economic interest. The Scoping Plan incorporates potential actions from the SFAP that provide GHG emissions reduction benefits (CARB 2022a).

Short-Lived Climate Pollutant Strategy

SB 1383 (Chapter 395, Statutes of 2016) requires CARB to develop and implement a Short-Lived Climate Pollutant (SLCP) Strategy with the following reductions in emissions by 2030 compared to 2013 levels: methane by 40%, HFCs by 40%, and black carbon (non-forest) by 50%. The bill also specifies targets for reducing organic waste in landfills. SB 1383 also requires CARB to adopt regulations to be implemented on or after January 1, 2024, specific to the dairy and livestock industry, requiring a 40% reduction in methane emissions below 2013 levels by 2030, if certain conditions are met. Lastly, the bill requires the California Department of Resources Recycling and Recovery (CalRecycle) to adopt regulations to take effect on or after January 1, 2022, to achieve specified targets for reducing organic waste in landfills.

According to its directive, CARB adopted the SLCP strategy in 2017, establishing a path to decrease SLCPs from various sectors of the economy. Strategies span from wastewater and landfill practices and methane recovery to reducing natural gas leaks and consumption. The SLCP strategy also identifies measures that can reduce HFC emissions through incentive programs and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (CARB 2017).

Transportation-Related Standards and Regulations

Advanced Clean Cars

AB 1493 of 2002 (known as Pavley I, Chapter 200, Statutes of 2002) provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that lowered GHG emissions from new light-duty automobiles to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards referred to as the ACC Program's Low Emission Vehicle (LEV) III Regulation was adopted for vehicle model years 2017–2025 in 2012 (13 California Code of Regulations [CCR] Section 1900 et seq.).

The ACC Program also includes the Zero Emission Vehicle Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of ZEVs, which include battery electric, fuel cell, and plug-in hybrid electric vehicles. The Clean Fuels Outlet regulation is intended to ensure that fuels, such as electricity and hydrogen, are available to meet the fueling needs of new advanced technology vehicles as they come to market. The ACC II Program was adopted by CARB in August 2022, and provides the regulatory framework for ensuring the sales requirement goal of EO N-79-20 to ultimately reach 100% ZEV sales in the state by 2035. The EPA granted CARB its California's CAA waiver request on December 18, 2024.

CARB certified the ACC II Program on August 25, 2022. The ACC II Program builds upon the existing ACC program and established more stringent ZEV sales requirements for future benchmark years. As part of its ACC program, CARB established more stringent GHG emission standards and fuel efficiency standards for fossil fuel–powered on-road vehicles than EPA. The ACC II Program sets sales requirements for ZEVs to ultimately reach the goal of 100% in the State by 2035. Notably, as summarized above, Public Law No. 119-16, which enacts House Joint Resolution 88, repeals the waiver under the CAA issued by EPA to the State to enforce ACC II. The State is under litigation against the federal government to reverse this decision.

Advanced Clean Trucks

CARB adopted the Advanced Clean Trucks (ACT) Regulation in March 2021, with minor amendments in 2024. The regulation aims to accelerate the sales of heavy-duty EVs. The regulation consists of two parts: a manufacturer component and a fleet reporting component. Manufacturers are required to sell an increasing percentage of heavy-duty ZEVs between 2024 and 2035. By 2035, 40% of Class 8 truck purchases will be required to be zero emission. Fleets with 50 or more vehicles will be required to report on their fleet's composition and activities to help CARB craft new strategies to hasten the adoption of ZEV (CARB 2021b). EPA granted the waiver request under the CAA to enact the more stringent fuel economy components of the ACT regulation on April 6, 2023 (EPA 2023). Notably, the passing of Public Law No. 119-16, described above, only rescinds the State's ability to enforce the ACC II regulation and does not affect implementation of the ACT Regulation.

Advanced Clean Fleets

CARB's 2022 Advanced Clean Fleets regulation was developed to reduce diesel PM through the transition of medium- and heavy-duty trucks to become fully electric by 2045. At the time of the writing of this Draft EIR, California has withdrawn its request for a waiver and authorization for the addition of the Advanced Clean Fleets regulation to its emissions control program (CARB 2025a). CARB is not enforcing the existing portions of the Advanced Clean Fleets regulation that requires a federal waiver or authorization, such as the portions of the Advanced Clean Fleet regulation that apply to high-priority and drayage fleets. However, not all elements of the Advanced Clean Fleets regulation require a federal waiver or authorization (CARB 2025b). State and local government fleets will still be required to be fully electric by 2045.

Executive Order B-48-18

Executive Order B-48-18, signed into law in January 2018, requires all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as 200 hydrogen-fueling stations and 250,000 EV-charging stations installed by 2025. It specifies that 10,000 of these charging stations must be direct-current fast chargers.

Low Carbon Fuel Standard

CARB adopted the Low Carbon Fuel Standard (LCFS) in 2007 to reduce the carbon intensity (CI) of California's transportation fuels. Low-CI fuels emit less carbon dioxide (CO_2) than other fossil fuel–based fuels, such as gasoline and fossil diesel. The LCFS applies to fuels used by on-road motor vehicles and off-road vehicles, including construction equipment (Wade pers. comm., 2017). On November 8, 2024, CARB approved amendments to the LCFS regulation to maintain momentum for global, national, and local private sector investment toward increasing cleaner fuel and transportation options for consumers, accelerating the deployment of zero-emission infrastructure and clean fuel production to support clean vehicle regulations, and keeping the State on track to meet statutorily mandated air quality and climate targets (CARB 2025c). On January 3, 2025, CARB submitted the final proposed amendments to the LCFS regulation to the Office of Administrative Law (OAL) for review in accordance with Government Code Section 11349.1 (CARB 2025c). On February 18, 2025, OAL issued a routine disapproval of amendments to the LCFS regulation on technical grounds, not on the merits of the regulation. CARB staff have 120 days to make necessary revisions and resubmit the regulation for OAL approval (CARB 2025c). As of the writing of this Draft EIR, CARB has not resubmitted the regulation for OAL approval.

Mobile Source Strategy

The Mobile Source Strategy was developed by CARB to provide an integrated planning perspective and common vision for transforming the mobile sector to achieve air quality and climate change goals. It uses conceptual scenarios to illustrate the emissions reduction potential of different vehicle technology mixes and VMT reductions to inform State policy development (CARB 2021a). The Mobile Source Strategy addresses on-road vehicles, including passenger cars and light-duty trucks, medium- and heavy-duty trucks, and buses, as well as off-road vehicles and equipment, including locomotives, cargo-handling equipment, and construction equipment. It supports multiple planning efforts, including the State implementation plans for criteria air pollutants, the Scoping Plan, the SLCP (discussed below), and the SFAP (discussed below). CARB is required to update the Mobile Source Strategy every 5 years. The 2020 Mobile Source Strategy continued the multipollutant planning approach to illustrate the pathways forward for the various mobile sectors that are necessary in order to achieve California's numerous goals and targets through 2050. CARB is currently developing the 2025 Mobile Source Strategy. A discussion draft of the 2025 Mobile Source Strategy was released on October 11, 2024 (CARB 2025d).

Senate Bill 743

SB 743 of 2013 changed CEQA Guidelines to no longer consider delay and congestion but instead focus on the impacts of VMT in transportation analyses. In support of these changes, LCI published its *Technical Advisory on Evaluating Transportation Impacts in CEQA,* which recommends that the transportation impact of a project be based on whether the project would generate a level of VMT per capita (or VMT per employee or some equivalent metric) that is 15% lower than that of existing development in the region, or that a different threshold is used based on substantial evidence (LCI 2017). LCI's technical advisory explains that this criterion is consistent with PRC Section 21099, which states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions" (LCI 2017). The advisory does not carry statutory authority. More detail about SB 743 is provided in Section 3.15, "Transportation."

Senate Bill 375

Since passage of SB 375 in 2008, CARB requires metropolitan planning organizations (MPOs) to develop and adopt SCSs (which is the subject of this EIR) as a component of the federally-prepared RTPs to show reductions in GHG emissions from passenger cars and light-duty trucks in their respective regions for 2020 and 2035 (CARB 2018). These plans link land use and housing allocation to transportation planning and related mobile source emissions.

SB 375 and CARB's emissions reduction targets are the primary mechanism to achieve GHG reduction goals for cars and light trucks under AB 32 targets, which were extended by SB 32 (see discussion above). **Table 3.6-6** provides a summary of the 2035 reduction targets for each MPO (as the 2020 targets are no longer applicable).

Table 3.6-6: SB 375 Regional Plan Climate Targets

MPO	2035 Target
MTC-ABAG	-19%
SACOG	-19%
SANDAG	-19%
SCAG	-19%
Fresno COG	-13%
Kern COG	-15%
Kings CAG	-13%
Madera CTC	-16%
Merced CAG	-14%
San Joaquin COG	-16%
Stanislaus COG	-16%
Tulare CAG	-16%
ABAG	-6%
Butte CAG	-7%
San Luis Obispo COG	-11%
Santa Barbara CAG	-17%
Shasta RTA	-4%
Tahoe MPO	-5%

Note: MPO = Metropolitan Planning Organization; SB = Senate Bill; SACOG = Sacramento Area Council of Governments; CTC = California Transportation Commission; COG = Council of Governments; CAG = Association of Governments; ABAG = Association of Monterey Bay Area Governments; SCAG = South California Association of Governments; RTA = Regional Transportation Authority. Targets are expressed as a percent change in per capita passenger vehicle GHG emissions relative to 2005.
Source: CARB 2025e.

California Transportation Commission Regional Transportation Plan Guidelines

The California Transportation Commission (CTC) publishes and periodically updates guidelines for the development of long-range transportation plans. According to Government Code Section 65080(d), each regional transportation planning agency (RTPA) is required to adopt and submit an updated RTP to CTC and Caltrans every 4 years. ABAG is the designated RTPA for the Bay Area region.

Under Government Code Section 14522, CTC is authorized to prepare guidelines to assist with the preparation of RTPs. The CTC's RTP guidelines suggest that projections used in the development of an RTP should be based upon available data (such as from the US Census Bureau), use acceptable forecasting methodologies, and be consistent with the California Department of Finance baseline projections for the

region. The guidelines further state that the RTP should identify and discuss any differences between the agency projections and those of the Department of Finance. The most recent update to the RTP guidelines was published in 2024. Since the previous update to the RTP guidelines document was adopted by CTC in 2017, new federal programs impacting the development of RTPs were finalized. The final rulemaking for federal performance measures were released, establishing new requirements for performance management to promote the efficient investment of federal transportation funds, and a federal surface transportation reauthorization bill, the Bipartisan Infrastructure Law, has been signed into law. It includes the largest federal investment in public transportation to date and a reauthorization of the core federal surface transportation program, which sets federal funding levels and policy direction from fiscal years 2022 through 2026 (CTC 2024).

Senate Bill 1383

SB 1383 of 2016 required that CARB approve and implement an SLCP to reduce emissions of short-lived climate pollutants. The SLCP specifies a 40% reduction in methane and hydrofluorocarbons and a 50% reduction in anthropogenic black carbon below 2013 levels by 2030. The bill also establishes targets for reducing organic waste in landfills and provides direction for managing methane emissions from dairy and livestock operations (CARB 2021c).

2022 Progress Report—California's Sustainable Communities and Climate Protection Act

On November 30, 2018, CARB released the *2022 Progress Report on California's Sustainable Communities and Climate Protection Act* (2022 Progress Report), which evaluates the performance of the SCSs prepared in accordance with the first set of reduction targets established by SB 375. The 2022 Progress Report found that MPOs are not on track to meet the GHG reductions expected under SB 375 due to continued increases in per capita GHG emissions and per capita VMT observed in nearly all MPO regions, though the rate of increase has slowed compared to the 2018 Progress Report. Although the 2018 Progress Report identified that the State would meet its overall 2020 GHG reduction target because of reductions achieved in the energy sector, the 2022 Progress Report notes that additional VMT reductions will be needed to meet longer-term State GHG reductions targets for 2030 and 2050.

Executive Order N-19-19

Governor Gavin Newsom issued EO N-19-19 on September 23, 2020, which outlines goals to combat climate change. The EO sets a series of emission goals, including for all new passenger cars and trucks, drayage trucks, and off-road vehicles and equipment to be zero-emission by 2035, and all medium- and heavy-duty vehicles to be zero emission by 2045 where feasible, giving CARB the authority to issue regulations for implementation. It also requires State agencies to accelerate the deployment of affordable fueling and charging options for ZEVs, and to develop a Zero-Emissions Vehicle Market Deployment Strategy by January 31, 2021. The EO also calls for the end of new hydraulic fracking permits by 2024, with State agencies expected to propose regulations to protect communities and workers by December 31, 2020.

Executive Order N-79-20

In September 2020, Governor Gavin Newsom signed EO N-79-20, which sets a statewide goal that 100% of all new passenger car and truck sales in the State will be zero-emissions by 2035. It also establishes a goal that 100% of statewide new sales of medium- and heavy-duty vehicles will be zero emissions by 2045, where feasible, and that all new drayage trucks sold in California will be zero emission by 2035. Additionally, the EO targets 100% of new off-road vehicle sales in the State to be zero emission by 2035. CARB is responsible for implementing the new vehicle sales regulation.

Senate Bill 288

SB 288 of 2020 amended PRC Section 21080.20 to provide additional statutory exemptions under CEQA. These exemptions include pedestrian and bicycle facilities projects; projects to improve customer

information and wayfinding for transit riders, bicyclists, and pedestrians; transit prioritization projects; projects to designate peak hours or full-time bus-only lanes on highways; projects to institute or increase new bus rapid transit; transit agency projects to construct or maintain infrastructure to charge or refuel zero-emissions transit buses; maintenance, repair, relocation, replacement, or removal of any utility infrastructure associated with exempt projects; and city or county projects to reduce minimum parking requirements. At the time of writing this Draft EIR, SB 288 sunsets in January 2030.

Caltrans Strategic Management Plan 2015-2020

The Strategic Management Plan of 2015-2020 named a strategic objective to reduce the environmental impacts from Caltrans transportation projects with an emphasis on supporting statewide emissions reduction goals. The targets included a 15% reduction from 2010 levels of GHGs and an 85% reduction from 2000 levels in diesel PM emissions statewide by 2020. It also held a reduction target of 2010 levels for internal operational GHGs of 15% by 2015 and 20% by 2020, according to EO B-18-12. An update to the Strategic Management Plan of 2015-2020 was released in 2020 and includes the GHG-related goal of reducing environmental impacts from the transportation system with emphasis on supporting a statewide reduction of GHG emissions to achieve 80% below 1990 levels by 2050.

Executive Order S-13-08

Governor Schwarzenegger signed EO S-13-08 on November 14, 2008, to address the potential impacts of global climate change, including sea level rise. The EO emphasizes the need for timely planning to mitigate and adapt to the potential effects of sea level rise on the State's resources. As a result, any State agency planning construction projects in areas vulnerable to future sea level rise must evaluate and reduce the potential risks and increase resiliency, to the extent feasible. Planning must consider a range of sea level rise scenarios for 2050 and 2100.

Climate Adaption and Resiliency

State of California Sea-Level Rise Guidance Document

EO S-13-08 directs the California Natural Resources Agency, in coordination with other State agencies and the National Academy of Sciences, to assess sea level rise for the Pacific coast and create official sea level rise estimates for State agencies in California, Oregon, and Washington. The assessment and official estimates are provided in the State of California Sea-Level Rise Guidance document (OPC 2018). *The State of California Sea-Level Rise Guidance: 2018 Update* is also referred to above in Section 3.6.1, "Environmental Setting."

The State of California Sea-Level Rise Guidance: 2018 Update contains eight recommendations for incorporating sea level rise into planning:

- prioritize social equity, environmental justice, and the needs of vulnerable communities;
- prioritize protection of coastal habitats and public access;
- consider the unique characteristics, constraints, and values of existing water-dependent infrastructure, ports, and public trust uses;
- consider episodic increases in sea level rise caused by storms and other extreme events;
- coordinate and collaborate with local, State, and federal agencies when selecting sea level rise projections, and where feasible, use consistent sea level rise projections across multiagency planning and regulatory decisions;
- consider local conditions to inform decision making;
- include adaptive capacity in design and planning; and

- assessment of risk and adaptation planning should be conducted at the community and regional levels.

The guidance document is expected to be updated regularly, to keep pace with scientific advances associated with sea level rise.

California Climate Adaptation Strategy

In response to EO S-13-08, the California Natural Resources Agency released the California Climate Adaptation Strategy (CAS) in 2009. The strategy proposes a comprehensive set of recommendations designed to inform and guide State agencies in their decision-making processes as they begin to develop policies to protect the State, its residents, and its resources from a range of climate change impacts. The CAS presents recommendations for seven sectors, including Ocean and Coastal Resources and Transportation and Energy Infrastructure.

In the Transportation and Energy Infrastructure sector, the CAS specifically directs Caltrans to incorporate climate change vulnerability assessment planning tools, policies, and strategies into existing transportation and investment decisions. The strategy also instructs Caltrans to develop guidelines to establish buffer areas and setbacks to avoid risks to structures within projected "high" future sea level rise or flooding inundation zones.

Caltrans Guidance on Incorporating Sea Level Rise

In accordance with EO S-13-08 and the *California Sea-Level Rise Interim Guidance* document, in May 2011 Caltrans released guidance on incorporating sea level rise into planning and decision making with respect to transportation projects. Caltrans's guidance recommends first determining whether sea level should be incorporated into project planning, based on the project location and level of risk. A screening process with 10 criteria guides the assessment of whether to incorporate sea level rise: design life, redundancy/alternative route(s), anticipated travel delays, evacuations/emergencies, traveler safety, expenditure of public funds, scope of project, effect on non-State highways, and environmental constraints. If the screening determines that sea level rise should be incorporated into project planning, the next step is to estimate the degree of potential impact and assess alternatives for preventing, mitigating, and absorbing the impact. Caltrans uses the statewide sea level rise estimates presented in the California Sea Level Rise Interim Guidance document for different years (2030–2100) to determine target sea level rise values, and it directs projects with a life that extends to 2030 or earlier not to assume impacts from sea level rise. Having identified target sea level rise values for a project, Caltrans then lays out steps for implementation, including conducting more technical studies of inundation and subsidence and determining any adverse effects on facility functions and operations (e.g., from erosion, exposure to salt water), necessary adaptation measures, and the costs of mitigation. Caltrans recently released an update to the guidance document late in 2024 (*2024 California Sea-Level Rise Interim Guidance*) (Caltrans 2024). In February 2022, a national report entitled *Global and Regional Sea Level Rise Scenarios for the United States* was released, which updated sea level scenarios for the United States based on global projections in the latest IPCC report (USGS 2022). This national update presented an opportunity to update California's sea level rise guidance with best available science and align the State's approach with national coastal adaptation efforts. The *2024 California Sea-Level Rise Interim Guidance* document includes updated sea level scenarios and policy recommendations and serves to support State and local action to assess vulnerability to rising seas and climate-driven flooding and the creation of adaptation plans and projects that build resilience into the future.

Draft 2030 Natural and Working Lands Implementation Plan

In a joint interagency effort, the California Environmental Protection Agency (CalEPA), California Department of Food and Agriculture, California Natural Resources Agency, CARB, and California Strategic Growth Council released the *Draft California 2030 Natural and Working Lands Climate Change*

Implementation Plan (Draft Plan) in January 2019 (and updated in April 2019 to include errata). The Draft Plan is specific to the natural and working lands sector, which includes farmland, rangeland, forests, grasslands, wetlands, riparian areas, seagrass, and urban green space. The Draft Plan addresses the carbon flux from this sector, including the ever-dynamic changes in both GHG emissions and carbon sequestration associated with the management of these lands, and includes reduction of GHGs and black carbon from forest fires and fire management. The Draft Plan serves as a multidisciplinary approach to conserve and maintain a resilient natural and working lands sector that will gradually shift the natural and working lands sector from being a net carbon emitter to being a net carbon sink, while also improving air quality, water quality, wildlife habitat, recreation, and providing other benefits.

The Draft Plan sets goals for, at a minimum, increasing the rate of State-funded soil conservation practices fivefold, doubling the rate of State-funded forest management and restoration efforts, tripling the rate of State-funded oak woodland and riparian reforestation, and doubling the rate of State-funded wetland and seagrass restoration. The measures included in the Draft Plan are projected to result in cumulative emissions reductions of -36.6 to -11.7 $MMTCO_2e$ by 2045 (CalEPA et al. 2019).

California Coastal Act

The California Coastal Act of 1976 directs the California Coastal Commission (CCC) to protect and enhance the State's coastal resources.

CCC has planning, regulatory, and permitting authority over all development within the coastal zone, whose landward boundary varies with location. For the Bay Area, the Coastal Act covers the area along the Pacific Ocean, but the area along the margins of San Francisco Bay is covered by BCDC, under different legislation. This is addressed later in this section. The act governs coastal hazards for new development, mandating that it minimize risks to life and property in areas of high flood. New development must be located such that it will not be subject to erosion or stability hazard over the course of its design life, and construction of protective devices (e.g., seawalls, revetment) that substantially alter natural landforms along bluffs and cliffs are not permitted (Section 30253).

CCC's mandate extends to climate change, including sea level rise; however, the agency is currently assessing how best to address sea level rise and other challenges resulting from climate change. CCC partners with local governments to form local coastal programs (LCPs), transferring the power to regulate development within the coastal zone to cities and counties. In the Bay Area, San Mateo, San Francisco, Marin, and Sonoma Counties and the Cities of Daly City, Pacifica, and Half Moon Bay all have certified LCPs. Any changes in CCC's policies or regulations with respect to sea level rise may ultimately require revisions to LCPs.

Senate Bill 272

SB 272 was approved by Governor Newsom on October 7, 2023, and requires that local governments lying, in whole or in part, in the coastal zone or in the jurisdiction of BCDC develop a sea level rise plan as part of either a local coastal program that is subject to approval by CCC consistent with the guidelines established under Section 30985.2(a) or a subregional San Francisco Bay shoreline resiliency plan that would be subject to approval by BCDC consistent with the guidelines established under Section 30985.2(b). SB 272 requires that all applicable local governments comply with the requirements of SB 272 to prepare a sea level rise plan by January 1, 2034.

Energy

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The act established State policy to

reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission regulates privately owned utilities in the energy, rail, telecommunications, and water fields.

California Building Energy Efficiency Standards (Title 24, Part 6 and Part 11)

The energy consumption of new residential and nonresidential buildings in California is regulated by the State's Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). CEC updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The current California Energy Code will require builders to use more energy efficient building technologies for compliance with increased restrictions on allowable energy use. The core focus of the building standards has been efficiency, but the 2019 Energy Code ventured into on-site generation by requiring solar photovoltaic (PV) on new homes, providing significant GHG savings. The most recent version is the 2022 California Energy Code, which advances the on-site energy generation progress started in the 2019 California Energy Code by encouraging electric heat pump technology and use, establishing electric-ready requirements when natural gas is installed, expanding solar PV system and battery storage standards, and strengthening ventilation standards to improve indoor air quality.

The 2025 Building Energy Efficiency Standards (2025 California Energy Code) were adopted on September 11, 2024, and will go into effect on January 1, 2026. According to CEC, the 2025 California Energy Code puts particular emphasis on encouraging efficient electric heat pump technology for space and water heating in newly constructed single-family, multifamily, and select nonresidential building types; replacing end-of-life rooftop heating, ventilation, and air-conditioning units of a certain size with high efficiency systems; establishing electric-ready requirements for commercial kitchens and some multifamily buildings; updating solar and storage standards for assembly buildings to make clean energy available for on-site use while minimizing exports to the electrical grid; and increasing ventilation standards to improve indoor air quality in multifamily buildings.

The Green Building Standards Code (CALGreen) was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 California Building Standards Code). The current version is the 2022 CALGreen Code, which took effect on January 1, 2023. As compared to the 2019 CALGreen Code, the 2022 CALGreen Code strengthened sections pertaining to EV and bicycle parking, water efficiency and conservation, and material conservation and resource efficiency. The CALGreen Code sets design requirements equivalent to or more stringent than those of the California Energy Code for energy efficiency, water efficiency, waste diversion, and indoor air quality. These codes are adopted by local agencies that enforce building codes and are used as guidelines by State agencies for meeting the requirements of EO B-18-12.

The 2025 CALGreen Code was adopted on September 11, 2024, and will go into effect on January 1, 2026. Relative to the 2022 CALGreen Code, the 2025 version proposes increased requirements for EV-charging infrastructure (i.e., a higher percentage of parking spaces that must be equipped with EV chargers and more stringent requirements for the types of chargers that must be installed) in both residential and nonresidential buildings. The 2025 CALGreen Code also includes required analysis of embodied carbon in building materials, which was not required under the 2022 CALGreen Code. Lastly, the 2025 CALGreen Code includes updates to energy efficiency standards aimed at further reducing energy consumption in buildings and promoting the use of renewable energy sources.

On June 30, 2025, the Governor signed AB 130, which institutes a six-year freeze on updates to state and local residential building standards, through 2031, with exceptions only for emergency measures, energy/fire safety, accessibility, and wildland-urban code updates. During this period, local jurisdictions may not adopt new residential building code amendments unless they are confirmed by the Building Standards Commission as emergency or health-and-safety necessities. The law also guarantees that

model-home building standards remain locked in for up to 10 years or until the design significantly changes, ensuring long-term planning stability and guarding builders against sudden code shifts.

State of California Energy Action Plan

CEC is responsible for preparing the State energy plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The 2003 California Energy Action Plan (2008 update) is the current plan. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies several strategies, including assistance to public agencies and fleet operators in implementing incentive programs for ZEVs and addressing their infrastructure needs, and encouragement of urban design that reduces VMT and accommodates pedestrian and bicycle access.

California Energy Efficiency Action Plan

The 2019 California Energy Efficiency Action Plan has three primary goals for the State: double energy efficiency savings by 2030 relative to a 2015 base year (per SB 350), expand energy efficiency in low-income and disadvantaged communities, and reduce GHG emissions from buildings. This plan provides guiding principles and recommendations related to how the State would achieve those goals. These recommendations include (CEC 2019):

- identifying funding sources that support energy efficiency programs,
- identifying opportunities to improve energy efficiency through data analysis,
- using program designs as a way to encourage increased energy efficiency on the consumer end,
- improving energy efficiency through workforce education and training, and
- supporting rulemaking and programs that incorporate energy demand flexibility and building decarbonization

Assembly Bill 2076: Reducing Dependence on Petroleum

In accordance with AB 2076 (Chapter 936, Statutes of 2000), CEC and CARB prepared and adopted a joint agency report in 2003, *Reducing California's Petroleum Dependence*. Included in this report are recommendations to increase the use of alternative fuels to 20% of on-road transportation fuel use by 2020 and 30% by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita VMT (CEC and CARB 2003). A performance-based goal of AB 2076 was to reduce petroleum demand to 15% below 2003 demand by 2030.

Integrated Energy Policy Report

SB 1389 (Chapter 568, Statutes of 2002) required CEC to "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the State's economy, and protect public health and safety" (PRC Section 25301[a]). This work culminated in the Integrated Energy Policy Report (IEPR).

CEC adopts an IEPR every 2 years and an update every other year. The 2023 IEPR is the most recent IEPR, including the 2024 Update to the 2023 IEPR. The 2023 IEPR provides a summary of priority energy issues currently facing the State, outlining strategies and recommendations to further the State's goal of ensuring reliable, affordable, and environmentally responsible energy sources. The report contains an assessment of major energy trends and issues within California's electricity, natural gas, and transportation fuel sectors. The report provides policy recommendations to conserve resources; protect the environment; ensure

reliable, secure, and diverse energy supplies; enhance the State's economy; and protect public health and safety. Topics covered in the 2023 IEPR include the accelerated connection of clean energy, the California Energy Demand Forecast, the potential growth of hydrogen in the State, and updates to issues such as energy efficiency, gas utility decarbonization, and the Clean Transportation Program (CEC 2024b).

Renewables Portfolio Standard

The State passed legislation referred to as the Renewables Portfolio Standard (RPS) that requires increasing use of renewable energy to produce electricity for consumers. California utilities are required to generate 33% of their electricity from renewables, as of 2020 (SB X1-2 of 2011); 52% by 2027 (SB 100 of 2018); 60% by 2030 (also SB 100 of 2018); and 100% by 2045 (also SB 100 of 2018). On September 16, 2022, SB 1020 was signed into law. This bill supersedes the goals of SB 100 by requiring that eligible renewable energy resources and zero-carbon resources supply 90% of all retail sales of electricity to California end-use customers by December 31, 2035, 95% by December 31, 2040, 100% by December 31, 2045, and 100% of electricity procured to serve all State agencies by December 31, 2035.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, a State policy that requires that eligible renewable energy and zero-carbon resources supply an increasing percent of all retail sales of electricity by 2045. The standards are set for 33% by 2020 (SB X1-2 of 2011), 52% by 2027 (California RPS [SB 100 of 2018]), 60% by 2030 (also SB 100 of 2018), and 100% by 2045 (also SB 100 of 2018).

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50% by December 31, 2030. It also establishes energy efficiency targets that achieve statewide, cumulative doubling of the energy efficiency savings in electricity and natural gas end uses by the end of 2030.

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statues of 2005) required CEC to prepare a State plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels Plan in partnership with CARB and in consultation with other federal, State, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative nonpetroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Assembly Bill 126

Approved by the governor on October 7, 2023, AB 126 includes provisions to provide, upon appropriation by the legislature, funding in the form of grants, revolving loans, loan guarantees, loans, or other appropriate funding measures to various private and public entities to help attain the State's climate change policies. AB 126 is intended to facilitate the development and deployment of zero-emission technology and fuels in the marketplace where feasible and near-zero-emission technology and fuels elsewhere. Provisions related to EVs and EV infrastructure include creation of the Air Quality Improvement Program (Health and Safety Code [HSC] Section 44274[a]) to provide funding for zero-emission fuel projects where feasible and near-zero-emission fuel projects elsewhere to develop and improve zero-emission and near-zero-emission fuels (HSC Section 44272 [h][1]), a program to provide funding for homeowners who purchase a plug-in EV to offset costs associated with modifying electrical sources to include a residential plug-in EV-charging station (HSC Section 44272 [h][13]). Awardees of funding for EV-charging infrastructure are required to report to the CEC "the source and greenhouse gas emissions

intensity, on an annual basis, of the electricity used and dispensed by electric vehicle charging stations at the meter" (HSC Section 44272[m]). Funding is also authorized to be provided toward incentives for medium- and heavy-duty vehicles and equipment mitigation, including electric, hybrid, and plug-in hybrid on-road and off-road medium- and heavy-duty equipment (HSC Section 44274[c][4]).

REGIONAL AND LOCAL REGULATIONS

Greenhouse Gas and Climate Change

City and County General Plans

Many of the counties and cities in the Bay Area have general plan elements and policies that specifically address energy use and conservation. Those energy conservation measures contain goals, objectives, and policies aimed at reducing energy consumption. These include policies for energy retrofits to existing residential and commercial land uses, zoning and building ordinances for energy efficiency of new construction, and ways to reduce VMT through land use and transportation priorities.

Local Climate Action Plans

Although not required, a majority of jurisdictions in the region participate in the creation of both emissions inventories and CAPs. Consistent with CARB recommendations, several Bay Area jurisdictions have completed community emissions inventories (105), and 89 jurisdictions have finalized and adopted community CAPs, as shown in **Table 3.6-7**. There are also jurisdictions that have drafted or are in the process of drafting CAPs that are not included in **Table 3.6-7**.

Table 3.6-7: Bay Area Cities and Counties with Completed GHG Emissions Inventories or Climate Action Plans

Jurisdiction	Completed Community Emissions Inventory	Finalized and Adopted Community Climate Action Plan
Alameda County		
Alameda	X	X
Albany	X	X
Berkeley	X	X
Dublin	X	X
Emeryville	X	X
Fremont	X	X
Hayward	X	X
Livermore	X	X
Newark	X	X
Oakland	X	X
Piedmont	X	X
Pleasanton	X	X
San Leandro	X	X
Union City	X	X
Contra Costa County		
Antioch	X	X
Brentwood	—	—

Jurisdiction	Completed Community Emissions Inventory	Finalized and Adopted Community Climate Action Plan
Clayton	—	—
Concord	X	X
Danville	X	X
El Cerrito	X	X
Hercules	X	—
Lafayette	X	—
Martinez	X	X
Moraga	X	X
Oakley	X	—
Orinda	X	—
Pinole	X	X
Pittsburg	X	—
Pleasant Hill	—	—
Richmond	X	X
San Pablo	X	X
San Ramon	X	X
Walnut Creek	X	X
Marin County		
Belvedere	X	X
Corte Madera	X	X
Fairfax	X	X
Larkspur	X	X
Mill Valley	X	X
Novato	X	X
Ross	X	X
San Anselmo	X	X
San Rafael	X	X
Sausalito	X	X
Tiburon	X	X
Napa County		
American Canyon	X	X
Calistoga	X	X
Napa	X	—
St. Helena	X	X
Yountville	X	X
San Francisco		
San Mateo County		
Atherton	X	X

Jurisdiction	Completed Community Emissions Inventory	Finalized and Adopted Community Climate Action Plan
Belmont	X	X
Brisbane	X	X
Burlingame	X	X
Colma	X	X
Daly City	X	X
East Palo Alto	X	X
Foster City	X	X
Half Moon Bay	X	X
Hillsborough	X	X
Menlo Park	X	X
Millbrae	X	X
Pacifica	X	X
Portola Valley	X	—
Redwood City	X	X
San Bruno	X	X
San Carlos	X	X
San Mateo	X	X
South San Francisco	X	X
Woodside	X	X
Santa Clara County		X
Campbell	X	—
Cupertino	X	X
Gilroy	X	—
Los Altos	X	X
Los Altos Hills	X	X
Los Gatos	X	X
Milpitas	X	X
Monte Sereno	—	—
Morgan Hill	X	X
Mountain View	X	X
Palo Alto	X	X
San Jose	X	X
Santa Clara	X	X
Saratoga	X	X
Sunnyvale	X	X
Solano County		X
Benicia	X	X
Dixon	X	—

Jurisdiction	Completed Community Emissions Inventory	Finalized and Adopted Community Climate Action Plan
Fairfield	X	X
Rio Vista	X	—
Suisun City	X	—
Vacaville	X	X
Vallejo	X	X
Sonoma County		
Cloverdale	X	—
Cotati	X	—
Healdsburg	X	X
Petaluma	X	X
Rohnert Park	X	—
Sebastopol	X	X
Santa Rosa	X	X
Sonoma (city)	X	X
Windsor	X	—
Regional Total	105	89

Source: Data compiled by Ascent in 2025.

The region's CAPs seek to help local jurisdictions achieve State emissions goals. They identify recommendations for meeting emissions goals, often in terms of different land uses or categories, including transportation, land use, energy, water, waste, and green infrastructure, and require monitoring of emissions over time.

Regional and County Sea Level Rise Programs San Francisco Bay Plan

BCDC is charged with the protection, enhancement, and responsible use of the San Francisco Bay. The agency's jurisdiction includes the bay itself, all land within 100 feet of the bay shoreline, salt ponds, managed wetlands, and certain waterways named in BCDC's law. BCDC guides uses of the bay and its shoreline through policies set forth in the McAteer-Petris Act; the Suisun Marsh Preservation Act; the San Francisco Bay Plan, originally adopted in 1968; and the Suisun Marsh Protection Plan, originally adopted in 1977. The policies included in BCDC's San Francisco Bay Plan address the uses of both the bay and shoreline, water quality, and the approach to bay fill. Additionally, the San Francisco Bay Plan has a number of proposals, including the development of ports, land preservation, development of parks and recreation, maintaining wildlife, and managing shipping channels. In 2019, BCDC amended its San Francisco Bay Plan to allow for more substantial fill when addressing sea level rise with multi-benefit adaptation projects, as well as added an Environmental Justice and Social Equity Amendment establishing new equity-focused requirements for project sponsors (BCDC 2020).

As required by SB 272 (discussed above), BCDC published the RSAP in December of 2024. The RSAP supports local governments and communities in the Bay Area in addressing coastal flood hazard risks through coordinated and consistent adaptation planning and implementation. The RSAP prioritizes establishing a regional vision for successful sea level rise adaptation, aligning regional and local priorities, reducing flood risk by improving multijurisdictional coordination, and standardizing and simplifying adaptation methods and data (BCDC 2024).

San Francisco Sea Level Rise Action Plan

In March 2016, the City and County of San Francisco released the *Sea Level Rise Action Plan* to identify actions that San Francisco can take now and in the near future to meet the challenge of sea level rise.

This plan addresses the immediate and long-term threats of sea level rise to the San Francisco shoreline through development of a comprehensive understanding of the threat of sea level rise and creation of a decisive plan of action. In general, the San Francisco Sea Level Rise Action Plan recommends one or a combination of three options to address sea level rise: accommodate (raise or waterproof assets in place), protect (create natural or engineered barriers, such as wetlands or levees), or retreat (relocate sensitive assets to low-risk areas or transition high-risk areas to lower-risk uses) (City of San Francisco 2016).

Resilient San Mateo Flood and Sea Level Rise Resiliency District

In 2018, the County of San Mateo and its 20 cities decided to modify the existing Flood Control District, operating since 1959, to expand its scope and restructure its governance. The modified agency, known as the Flood and Sea Level Rise Resiliency District, addresses sea level rise, flooding, coastal erosion, and regional stormwater infrastructure across the county, with an emphasis on multijurisdictional solutions. It coordinates with the county's Flood Resilience Program, created in 2016, which helps address cross-jurisdictional flood risks (San Mateo 2018a). The San Mateo County Sea Level Rise Vulnerability Assessment, which the agency completed in 2018, found that a midlevel 2100 sea level rise scenario could inundate property assessed at $34 billion. On the coastal side, $932 million in assessed property value could be at risk of erosion north of Half Moon Bay (San Mateo 2018b).

Marin Ocean Coast Sea Level Rise Adaptation Report

The *Marin Ocean Coast Sea Level Rise Adaptation Report* was released in February 2018 and most recently received updates in February of 2024. This plan for Marin County's ocean coast builds off a 2015 vulnerability assessment, which measured the vulnerability of parcels and homes, transportation networks, utilities, working lands, natural resources, recreational activities, emergency services, and historic and archaeological resources. The report plans on 3 feet of sea level rise inundation by 2100, and presents actions for the coast to accommodate, protect, or retreat from sea level rise inundation and storms. The report highlights plans for each of the coastal communities, and suggests potential implementation for adaptation strategies for the area. Adaptation strategies are prioritized by timeline and suggest potential partners for development (County of Marin 2018).

Solano County Sea Level Rise Strategic Program

In June 2011, Solano County released its Sea Level Rise Strategic Program (SLRSP) to address climate change and associated sea level rise at the local level. As directed by the county's general plan, the SLRSP investigates the potential effects of sea level rise on Solano County, including the effects on specific properties and resources, and presents protection and adaptation strategies. The SLRSP considers two inundation scenarios: 16 inches by midcentury and 55 inches by the end of the century.

Major roads and highways, along with railways, in the county are considered to be highly sensitive and vulnerable to the effects of sea level rise, with low adaptive capacity. Residential, industrial, and commercial developments are also all highly sensitive and vulnerable to sea level rise, although the adaptive capacity of these uses is low to medium, given the ability for residents and businesses with resources to pursue alternative locations. For all new transportation infrastructure and development, the SLRSP recommends designing projects to tolerate periodic flooding and providing for new development that can be adapted or relocated. The SLRSP notes the difficulty in determining adaptive strategies for transportation infrastructure because they will be developed based on future vulnerability and risk analyses specific to each asset. However, it specifically recommends collaborating with MTC and Caltrans on adaptation planning for affected roadways (County of Solano 2011).

Energy

Community Choice Aggregation Programs

Several Community Choice Aggregation (CCA) programs operate in the Bay Area. A CCA allows local governments to partner with local utilities to procure power on behalf of its residents, businesses, and municipal accounts. CCAs use the transmission and distribution services of a utility while supporting a municipality's choice to obtain energy from typically greener sources. CCAs in the plan area include East Bay Community Energy, Peninsula Clean Energy, MCE, CleanPowerSF, San Jose Clean Energy, Silicon Valley Clean Energy, and Sonoma Clean Power, all of which have partnered with PG&E.

3.6.3 Impact Analysis

SIGNIFICANCE CRITERIA

The issue of global climate change is inherently a cumulative issue because the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed plan's impact on climate change is addressed only as a cumulative impact.

Significance criteria are based on Section 15064.4 of the CEQA Guidelines and relevant portions of Appendix G of the CEQA Guidelines, which recommend that a lead agency consider a project's consistency with relevant, adopted plans, and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions, and Appendix F of the CEQA Guidelines, which requires consideration of potentially significant energy implications of a project.

With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or performance-based standards" (Section 15064.4[a]). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change" (Section 15064.4[c]). The CEQA Guidelines provide that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment (Section 15064.4[b]):

- The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Based on Appendix F and Appendix G of the CEQA Guidelines, guidance provided by the Bay Area Air District, and professional judgment, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- Result in a net increase in GHG emissions, either directly or indirectly, compared to existing conditions (2023 data), that may have a significant impact on the environment (Criterion GHG-1);
- Conflict with the Bay Area region's achievement of the GHG emissions reduction target of 19% below 2005 emissions by 2035 established by CARB pursuant to SB 375 (Criterion GHG-2);

- Conflict with an applicable State plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (Criterion GHG-3);
- Conflict with an applicable local plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (Criterion GHG-4); or
- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (Criterion EN-1); or
- Conflict with or obstruct a State or local plan for renewable energy or energy efficiency (Criterion EN-2).

METHOD OF ANALYSIS

Greenhouse Gas Emissions

The baseline for this analysis is existing conditions. Existing conditions are most accurately reflected by using 2023 data because it is the most recent year for which comprehensive data on emissions, energy, demographics, and travel volume are available for the Bay Area region. However, a 2005 baseline is used for the analysis under GHG-2 to satisfy statutory requirements of SB 375, which benchmark the year for comparison to the proposed plan's requisite greenhouse gas reduction targets. A 1990 baseline is used for GHG-3 for an assessment of the proposed plan's consistency with SB 32.

Global Warming Potential Factors

To remain consistent with the Bay Area Air District's 2015 GHG inventory for the Bay Area, 100-year timeframe GWP factors from the IPCC Fifth Assessment Report (FAR) were applied to calculate CO_2e. The Bay Area Air District specifically chose FAR for their inventory to keep up with the latest science on climate, which differs from the Fourth Assessment Report assumptions utilized by CARB. Under FAR, methane, and N_2O are considered to have GWP factors of 34 and 298, respectively (IPCC 2014; BAAQMD 2017). Only CO_2, methane, and N_2O emissions were considered for analysis, reflecting the Bay Area Air District's standard, as other GHGs were considered to be negligible.

Construction Emissions

GHG emissions from the operation of construction equipment can vary depending on the level of activity, the specific operations taking place, the equipment being operated, and other factors. A qualitative analysis of potential GHG emissions from construction activity associated with projected land use development and proposed transportation projects was conducted. At the program level of analysis, it is not possible to accurately quantify the amount of emissions expected from implementation of the proposed plan because of variability in the extent of construction based on site conditions throughout the Bay Area, and the fact that project details needed to conduct such an analysis are not and cannot be known at this level of analysis.

Operational Emissions

Land use emissions and motor vehicle emissions are evaluated differently, and thus, are explained separately. Land use emissions are qualitatively assessed whereas motor vehicle emissions are modeled using CARB's EMFAC2017 and EMFAC2021 models. For further explanation, please see the sections below, with further details available in Appendix D.

Land Use Emissions

Because project-specific information, such as individual land use size and building design features, are unknown at this programmatic stage, the emissions from the projected land use growth footprint of the plan are assessed qualitatively utilizing statewide and regional emissions inventories and trends. Moreover, while the proposed plan includes a comprehensive map that directs growth to transit priority areas to reduce regional automobile VMT to meet the targets of SB 375, the plan does not, itself, induce

growth to the MTC and ABAG plan area. Rather, the plan has been prepared in response to projected employment and population growth in the MTC and ABAG plan area and intentionally focuses growth to reduce potential VMT impacts. Consequently, emissions produced from the construction and operation of new land use development could occur regardless of implementation of the plan. This further supports the propriety qualitatively assessing land use-related GHG emissions.

It is foreseeable that future project-level assessments of land use development projects may determine land use-related impacts to be significant or less than significant, depending on size and project design commitments. However, at this programmatic level, these levels of emissions cannot be quantified with a high degree of certainty.

Motor Vehicle Emissions

Motor vehicle, or mobile source, emissions were calculated using MTC's travel demand forecasting model, Travel Model 1.6, and mobile source emission factors developed by CARB. Travel Model 1.6 produces forecasts of travel behavior and vehicle activity from 2023, the closest available year where baseline data is available, and 2050, the horizon year for the proposed plan. Travel Model 1.6 has been extensively reviewed by federal and State agencies and refined in connection with the application to air quality analyses of various kinds. Key model outputs for use in air quality analyses include total daily vehicle trips, VMT, and distribution of VMT by speed and time period. This information was then used to determine total emissions from transportation activity in the Bay Area using motor vehicle emission factors from CARB's EMFAC.

Vehicle activity projections are correlated to changes in demographic, housing, and socioeconomic factors. For calculations relying on outputs from Travel Model 1.6 and population totals (i.e., per capita VMT or per capita energy use), model-simulated population levels were used to ensure consistency. Simulated population may be slightly different from overall population forecasts for the proposed plan and alternatives due to slight variability in modeling tools (please refer to Chapter 1 for an explanation of the different modeling tools).

As identified in Section 3.6.2, "Regulatory Setting," several of California's waivers for mobile source regulations under the CAA have been rescinded following Congressional action. While the California Attorney General has filed lawsuits challenging P.L. No. 119-16 and P.L. No. 119-17, the implications of these laws on the State's capability to enforce its independent fuel economy standards are uncertain at this time because litigation is still pending. However, if P.L. No. 119-17 remains in place, GHG emissions in California will be substantially higher than if California continued to implement its own fuel economy standards under the CAA and in effect prior to the Congressional recission. CARB has not provided guidance, to date, on how to address these uncertainties in using its EMFAC modeling.

In an effort to account for a range of potential scenarios, depending on whether the ACC II regulation is enacted in the future, a range of mobile source emissions estimates were calculated for the proposed plan. Although the Bay Area Air District requested use of EMFAC2025, the most recently developed mobile source emissions model, in its response to the Notice of Preparation, MTC anticipates that this may result in underestimating future emissions if the recission remains. MTC anticipates that CARB will recommend off-model adjustments to EMFAC2021 to account for a scenario in which the recission remains in place, but no guidance has been issued at the time of this analysis. Therefore, older emissions models, which do not assume termination of gas engine vehicle sales by 2035, for instance, were used to determine project-related impacts. Emissions were calculated using both EMFAC2017 and EMFAC2021. Therefore, the analyses in this EIR do not account for ACC II because ACC II had not yet been adopted at the time the EMFAC2017 and EMFAC2021 methodologies were last updated and thus were not factored into the modeling. See Appendix D for details regarding the various state and federal laws, regulations, and legislative actions accounted for in EMFAC2017 and EMFAC2021. Because EMFAC2021 applies emissions reductions based on more recent mobile source emissions regulations, emissions calculated

using EMFAC2021 are considered a less conservative estimate of emissions. Calculations made using EMFAC2017 provide a more conservative (higher level) estimate of emissions because EMFAC2017 includes emissions reduction estimates based on older, less stringent mobile-source emissions regulations. Notably, EMFAC2021 assumes implementation of the Low NO_X rule and EIR mobile source emissions thus do not account for the June 12, 2025, disapproval of the Low NO_X rule. Despite this, EMFAC2021 remains the current federally-approved model for estimating emissions in California and there is legal uncertainty regarding the enforceability of the federal disapproval of these regulations. Given these considerations, use of EMFAC2017 and EMFAC2021 to estimate a range of potential impacts are considered more conservative methodologies than relying on EMFAC2025, as requested by the Bay Area Air District, to calculate mobile source emissions. As stated above, it is anticipated that CARB will recommend adjustments to the EMFAC2021 model to account for the uncertainty in the regulatory landscape as it is related to transportation-related regulations. The range of emissions calculated using EMFAC2017 and EMFAC2021 is intended to provide a range between which project-generated emissions estimated using the adjusted EMFAC2021 model would likely fall.

EMFAC2017 and EMFAC2021 generate emission factors for all types of on-road vehicles in different seasons and driving conditions. CARB developed these factors based on thousands of emissions tests on both new and used vehicles recruited randomly from the California fleet. In both EMFAC models, the emission rates were combined with vehicle activity data provided by regional transportation agencies (such as MTC) to calculate the regional emissions inventories.

Consistency with Greenhouse Gas Reduction Policies and Plans

The assessment for Criterion GHG-3 evaluates the proposed plan's likelihood to impede implementation of State policies and plans, including statewide goals set by SB 32, AB 1279, and the 2022 Scoping Plan, by comparing emissions projected by the plan with the State's long-term goals. SB 32 codifies a statewide reduction of GHG emissions to 40% below 1990 levels by 2030, whereas AB 1279 codified the goal of achieving net zero emissions as soon as possible, as well as reducing anthropogenic emissions at least 85% below 1990 levels by 2045. Consistent with these statewide targets, CARB's emissions limit for 2045 is approximately 65 $MMTCO_2e$, which is approximately 85% below 1990 levels and 83% below the 2022 inventory levels (CARB 2022a).

Assessment for Criterion GHG-4 evaluates the plan in the context of local CAPs and general plans in the jurisdiction of MTC and ABAG. This analysis, in contrast to other impacts in this section, is assessed qualitatively. For further information on the region's local plans, please see **Table 3.6-7** in Section 3.6.2, "Regulatory Setting," above.

Energy

The total levels of energy consumption by the proposed plan residential and commercial sectors, measured in gigawatt hours of electricity, Btu of natural gas, gallons of gasoline, and gallons of diesel fuel, were estimated for the existing conditions baseline using 2023 data and the plan horizon year (2050). Lesser-used forms of energy were excluded from the analysis, including fuel and heating oils, which are typically used in more rural settings than the plan jurisdiction, and propane, which is difficult to model due to its various forms. Fuel consumption estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 and EN9 due to modeling limitations. The total levels of gasoline and diesel fuel consumption in the region were estimated based on the analysis of VMT in the region and estimates of mobile source GHGs in the region provided by MTC, fleet-average CO_2 emission rates for the region, and the carbon content of both fuel types. Fleet-average CO_2 emission rates for the region for both 2023 and 2050 were developed using EMFAC2017 and EMFAC2021 to account for variability in the future regulatory landscape. **Table 3.6-8** summarizes the levels of gasoline and diesel consumption for each year by vehicle category in the plan area using EMFAC2021 estimates.

Table 3.6-8: Daily Levels of Gasoline and Diesel Consumption[1] (EMFAC2021)

Vehicle Category	2023 Gasoline (thousands gal/day)[2]	2023 Diesel (thousands gal/day)[2]	2023 Natural Gas (thousands gal/day)[2]	2050 Gasoline (thousands gal/day)[2]	2050 Diesel (thousands gal/day)[2]	2050 Natural Gas (thousands gal/day)[2]	Net Change Gasoline (thousands gal/day)[2]	Net Change Diesel (thousands gal/day)[2]	Net Change Natural Gas (thousands gal/day)[2]
Passenger Vehicles	5,000	20	-	4,600	10	-	-410	-10	-
Trucks	380	1000	40	190	940	40	-190	-80	-3
Buses	30	60	5	10	30	1	-20	-30	-4
Other Vehicles	30	4	-	30	4	-	-1	-	-
All Vehicle Types	5,400	1,100	40	4,800	990	40	-630	-120	-7
Total Fuel	**6,600**			**5,800**			**-750**		

Notes: gal/day = gallons per day.

[1] Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.

[2] Gasoline and diesel consumption forecasts do not account for expected reductions from the implementation of Strategy EN8 or EN9.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Table 3.6-9 summarizes the levels of gasoline and diesel consumption for each year by vehicle category in the plan area using EMFC2017 estimates.

Table 3.6-9: Daily Levels of Gasoline and Diesel Consumption[1] (EMFAC2017)

Vehicle Category	2023 Gasoline (thousands gal/day)[2]	2023 Diesel (thousands gal/day)[2]	2023 Natural Gas (thousands gal/day)[2]	2050 Gasoline (thousands gal/day)[2]	2050 Diesel (thousands gal/day)[2]	2050 Natural Gas (thousands gal/day)[2]	Net Change Gasoline (thousands gal/day)[2]	Net Change Diesel (thousands gal/day)[2]	Net Change Natural Gas (thousands gal/day)[2]
Passenger Vehicles	4,500	40	-	3,900	40	-	-590	1	-
Trucks	330	970	-	290	1,000	-	-30	40	-
Buses	30	70	-	20	70	-	-4	1	-
Other Vehicles	40	3	-	40	3	-	2	0	-
All Vehicle Types	4,900	1,100	-	4,300	1,100	-	-630	50	0
Total Fuel	**6,000**			**5,400**			**-580**		

Notes: gal/day = gallons per day.

[1] Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.

[2] Gasoline and diesel consumption forecasts do not account for expected reductions from the implementation of Strategy EN8 or EN9.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

The proposed plan's forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects would be expected to result in the consumption of energy in the form of gasoline and diesel fuel during construction activities. Because detailed construction information was not available, the energy analysis addresses these potential impacts at a program level.

IMPACTS AND MITIGATION MEASURES

Impact GHG-1: Result in a net increase in greenhouse gas emissions, either directly or indirectly, compared to existing conditions that may have a significant impact on the environment (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction Emissions

The level of GHG emissions from construction activity would depend on the type and scale of projects being constructed under the proposed plan. Generally, GHGs could be generated from a variety of activities and emission sources (e.g., exhaust emissions from off-road construction equipment, material delivery trips, and construction worker-commute trips). These emission types and associated levels fluctuate greatly depending on the particular type, number, and duration of usage for the varying equipment. The site preparation phase typically generates the most substantial emission levels because of the on-site equipment and ground-disturbing activities associated with grading, compacting, and excavation. Site preparation equipment and activities typically include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers).

Construction activity tends to be temporary in nature for individual projects and would be expected to occur throughout the proposed plan's implementation period through 2050 because of the various land use growth footprint, sea level rise adaptation projects, and transportation projects that could be constructed. Where regulatory requirements or permitting requirements exist that are legally or otherwise binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. However, because construction emissions may not be reduced to net zero in all cases, this impact would be potentially significant (PS).

Operational Emissions

Land Use Impacts

As explained in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that the region will support an increase in regional employment of 1.4 million jobs between 2020 and 2050 for a total of approximately 5.4 million total jobs in 2050. Population is forecasted to grow by 1.8 million people between 2020 and 2050 to 9.6 million in 2050. The projected development as part of the proposed plan would increase direct and indirect GHG emissions from building electricity and natural gas use, water use, wastewater treatment, waste generation, and landscaping equipment. However, the proposed plan was designed to accommodate the people, households, and jobs identified in the regional growth forecast, and includes land use strategies that would promote denser or more compact development in designated Growth Geographies. These strategies would allow greater densities for new residential and commercial development in select Planned Development Areas (PDAs) and select Transit-Rich Areas and provide incentives to employers to shift jobs to housing-rich areas well served by transit. Increasing housing density generally results in fewer GHG emissions per capita, as well as the criteria pollutant emissions associated either directly or indirectly with a single person. This is because GHG emissions are considered more efficient when a given area houses a larger number of people in a smaller area. Therefore, the proposed plan would be considered more efficient in terms of emissions per capita

because the forecasted development pattern would accommodate a greater number of people in existing infill areas. The proposed growth pattern would thereby limit an increase in emissions.

In addition, improved building energy efficiency standards and increased renewable energy sources for electricity would reduce future GHG emissions from new land use. Notably, as the California Energy Code continues to be updated on a triennial basis, future iterations of the California Energy Code will likely become more energy efficient than the current 2025 code, as well as include restrictions on the use of on-site natural gas consumption as the building sector trends toward decarbonization. Therefore, emissions from building energy consumption in 2035 may be overestimated. However, the exact level of energy efficiency and allowed on-site natural gas associated with future versions of the California Energy Code are unknown. However, AB 130 enacts restrictions on modifications to future iterations of the California Building Standards Code for residential development until 2031. AB 130's moratorium on updating the California Building Standards Code for residential development would affect the GHG reductions associated with future iterations of the California Building Standards Code which have historically increased the energy efficiency of buildings. Energy efficiency and renewable energy design features to reduce electricity demand and promote on-site renewable energy associated with future versions for the California Energy Code would not be realized for residential development beyond what is required by the 2025 version of the code. Because the projected development as part of the proposed plan would increase direct and indirect GHG emissions from building electricity and natural gas use, water use, wastewater treatment, waste generation, and landscaping equipment, implementation of the forecasted development pattern under the proposed plan would contribute toward a net increase in GHG emissions. This impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

The operation of sea level rise adaptation projects would not result in GHG emissions because it would not include stationary equipment that would generate or emit emissions. Therefore, the proposed plan's sea level rise adaptation projects are not anticipated to generate or emit GHG emissions during operation. This impact would be less than significant (LTS).

Transportation System Impacts

The proposed plan includes a number of strategies aimed at reducing GHG emissions from mobile sources through reducing auto trips, expanding clean vehicle initiatives, and expanding transportation demand programs. However, with the operation of new transportation projects, as well as the growing number of residents and jobs in the region, total on-road transportation GHG emissions would be expected to increase over time if no standards were put in place. This analysis incorporates implementation of Pavley regulations (see Section 3.6.2, "Regulatory Setting") over the life of the proposed plan.

As shown in **Table 3.6-10**, when these Pavley standards are considered using EMFAC2021 estimates, overall on-road vehicle GHG emissions would decline by 8% for passenger vehicles. Pavley standards only affect passenger vehicles, but emissions from trucks estimated using EMFAC2021 would decline by 18% while emissions from buses would decline by 55% due to adopted regulations, such as the ACT and Heavy Duty Omnibus regulations (CARB 2021d). Emissions from buses would decline by 4% due to adopted regulations, such as the ACT and Heavy Duty Omnibus regulations (CARB 2021d). Emissions from "other vehicles" would decrease by 1% when estimated using EMFAC2021.

Comparatively, as shown in **Table 3.6-11**, when Pavley standards are considered using EMFAC2017 estimates, overall on-road vehicle GHG emissions would decline by 13% for passenger vehicles. Pavley standards only affect passenger vehicles, but emissions from trucks estimated using EMFAC2017 would increase by 1% (likely due to omission of ACT-related reductions). Emissions from "other vehicles" would increase by 5% when estimated using EMFAC2017.

Table 3.6-10: Existing and Forecasted Daily Transportation GHG Emissions by Vehicle Source ($MTCO_2e$) (EMFC2021)

Emission Source	2023	2050 Proposed Plan	Change from 2023	Percent Change from 2023
Passenger Vehicles	43,300	39,700	-3,600	-8%
Trucks	14,000	11,600	-2,500	-18%
Buses	910	410	-500	-55%
Other Vehicles	300	290	-4	-1%
Total	**58,600**	**52,000**	**-6,600**	**-11%**

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent; GHG= greenhouse gas. Values include clean car standards. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum due to independent rounding. Estimates calculated using EMFAC2021. MTC applied a ratio of 1:00:1:02 to all EMFAC2021 generated CO_2 estimates for conversion to CO_2e. Emissions were annualized by multiplying by 300 to take account for the fact that there is less traffic on weekends. Emission estimates do not account for expected reductions from the implementation of Strategy EN8 or EN9.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Table 3.6-11: Existing and Forecasted Daily Transportation GHG Emissions by Vehicle Source ($MTCO_2e$) (EMFAC2017)

Emission Source	2023	2050 Proposed Plan	Change from 2023	Percent Change from 2023
Passenger Vehicles	39,300	34,200	-5,100	-13%
Trucks	12,700	12,900	180	1%
Buses	910	880	-40	-4%
Other Vehicles	350	360	20	5%
Total	**53,200**	**48,300**	**-4,900**	**-9%**

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent; GHG= greenhouse gas. Values include clean car standards. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Estimates calculated using EMFAC2017. MTC applied a ratio of 1:00:1:02 to all EMFAC2017 generated CO_2 estimates for conversion to CO_2e. Emissions were annualized by multiplying by 300 to take account for the fact that there is less traffic on weekends. Emission estimates do not account for expected reductions from the implementation of Strategy EN8 or EN9.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Emissions are reported on a regional basis, with respect to mobile sources. According to calculations performed using EMFAC2021, changes in transportation activity under the proposed plan would result in a net reduction of approximately 6,600 $MTCO_2e$/year, or 11%, from existing conditions to 2050, as shown in **Table 3.6-12**.

Table 3.6-12: Annual GHG Emissions from Projected Transportation Sources ($MTCO_2e$/year) (EMFAC2021)

Sources	2023 Baseline	2035 Proposed Plan	2050 Proposed Plan	Change from Baseline to 2050	Percent Change from Baseline to 2050
Transportation	58,600	n/a	52,000	-6,600	-11%

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Emission estimates do not account for expected reductions from the implementation of Strategy EN2, EN3, EN8, or EN9.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Comparatively, according to calculations performed using EMFAC2017 estimates, changes in transportation activity under the proposed plan would result in a net reduction of approximately 5,300 $MTCO_2e$, or 9%, from existing conditions to 2050, as shown in **Table 3.6-13**.

Table 3.6-13: Annual GHG Emissions from Projected Transportation Sources ($MTCO_2e$/year) (EMFAC2017)

Sources	2023 Baseline	2035 Proposed Plan[1]	2050 Proposed Plan	Change from 2050 to Baseline	Percent Change from 2050 to Baseline
Transportation	57,500	48,300	52,200	-5,300	-9%

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Emission estimates do not account for expected reductions from the implementation of Strategy EN2, EN3, EN8, or EN9.
Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Conclusion

The forecasted development pattern and transportation network improvements and programs of the proposed plan, combined with the implementation of federal and State regulations that would result in reduced GHG emissions from activities in the plan area, would lead to lower total GHG emissions in both 2035 and 2050 as compared to 2023. Notably, regional GHG emissions reductions would likely still occur in a scenario where the proposed plan is not implemented. This is due to the implementation of State and local regulations regarding GHG reductions across all sectors, which have created a statewide downward trend in GHG emissions. Therefore, it is foreseeable that regional GHG emissions would decrease as a result of statewide and local regulations.

As stated in "Method of Analysis," to provide a conservative estimate of emissions and associated impacts, this analysis bases its impact determinations on the most conservative emissions estimates calculated using EMFAC2017 and EMFAC2021. Therefore, it is conservatively assumed that daily emissions in 2050 with implementation of the proposed plan would be 4,900 $MTCO_2e$ (9%) less than daily emission estimated for the 2023 baseline (**Table 3.6-11**). It should be noted that while passenger vehicle emissions estimated using EMFAC2021 (**Table 3.6-12**) would be higher than those estimated using EMFAC2017 (**Table 3.6-11**), the emissions reductions calculated using EMFAC2017 remain the most conservative estimate of overall transportation-related GHG emissions under the plan due to lower overall reduction projections. Regarding annual emissions, with implementation of the proposed plan, annual emissions are estimated to be 5,900 $MTCO_2e$/year (9%) less than annual emissions estimated for the 2023 baseline (**Table 3.6-13**).

Implementation of the proposed plan is expected to result in a net reduction in GHG emissions in 2050 when compared to existing conditions. However, because construction emissions may not be reduced to net zero in all cases, this impact would be **potentially significant (PS)**. Mitigation Measure GHG-1 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure GHG-1 The applicable lead agency can and should implement, where feasible and as applicable to address site-specific construction climate change impacts, the following measures (or equally effective measures) to avoid or minimize impacts related to construction GHG emissions:

- Project proponents shall require its contractors to restrict the idling of on- and off-road diesel equipment to no more than 5 minutes while the equipment is on-site.
- Project proponents of new facilities shall implement waste, disposal, and recycling strategies (i.e., 10% recycled content for Tier 1 and 15% recycled content for Tier 2) in accordance with the voluntary measures for nonresidential land uses contained in Section A5.405 of the 2022 CALGreen Code or in accordance with any update to these requirements in future iterations of the CALGreen Code in place at the time of project construction.

- Project proponents of new facilities shall achieve or exceed the enhanced Tier 2 target for nonresidential land uses of recycling or reusing 80% of the construction waste as described in Section A5.408 of the 2022 CALGreen Code or in accordance with any update to these requirements in future iterations of the CALGreen Code in place at the time of project construction.
- Project proponents shall require all diesel-powered, off-road construction equipment meet EPA's Tier 3 or Tier 4 emissions standards as defined in 40 CFR 1039 and comply with the exhaust emission test procedures and provisions of 40 CFR Parts 1065 and 1068. This measure can also be achieved by using battery-electric off-road equipment as it becomes available.
- Project proponents shall implement a program that incentivizes construction workers to carpool and use public transit or EVs to commute to and from the project site.

Significance after Mitigation

Implementation of Mitigation Measure GHG-1 would mitigate the GHGs emitted during the construction phase of the projected land use growth footprint, sea level rise adaptation, and transportation projects under the proposed plan. Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. If these mitigation measures were adopted by the implementing agency, construction related impacts could be reduced, but not necessarily to a less-than-significant level, and this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact GHG-2: Conflict with the Bay Area region's achievement of the GHG emissions reduction target of 19% below 2005 emissions by 2035 established by CARB pursuant to SB 375 (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The proposed plan includes land use strategies that would allow for denser or more compact development in designated Growth Geographies. These strategies would allow greater densities for new residential and commercial development in select Growth Geographies and provide incentives to employers to shift jobs to housing-rich areas well served by transit. By concentrating future growth at higher densities around existing and proposed transit investments, the proposed plan would help reduce driving and associated mobile source GHG emissions. This is achieved through focused development Growth Geographies under the proposed plan, such as PDAs (places nominated by local governments served by transit and planned for new homes and jobs at densities necessary to support effective transit service) and TRAs (places near rail, ferry or frequent bus service that were not already identified as PDAs). See Section 2.3.4, "Proposed Plan Growth Geographies," in Chapter 2, "Project Description," for details regarding the various Growth Geographies under the proposed plan. **Figure 2-5**, "Growth Geography Designations by Type," in Chapter 2 provides a map detailing the locations of each type of Growth Geography designation in the plan area.

The proposed plan sea level rise adaptation projects are not expected to increase emissions. Instead, the adaptation projects would alleviate risk from inundation of existing and forecasted development and transportation infrastructure and support the proposed plan's core land use approach to "focus growth" in existing communities along the existing transportation network.

The proposed plan would also result in the implementation of transportation projects. However, several strategies in the proposed plan would reduce emissions from cars and light-duty trucks. As shown in **Table 3.6-14**, Strategy EN8, "Expand Clean Vehicle Initiatives," includes strategies to support EV adoption and charging infrastructure, and Strategy EN9, "Expand Transportation Demand Management Initiatives," includes strategies that are expected to reduce vehicle trips and, subsequently, on-road passenger vehicle emissions by nearly 5,586 $MTCO_2$ per day in 2035. As noted in the methodology, Travel Model 1.6 is not sensitive to the

full range of strategies in the proposed plan. As a result, the emissions reduction benefits of Strategy EN8 and Strategy EN9 are calculated "off-model" consistent with guidance from CARB.

Table 3.6-14: Plan Bay Area 2050 Strategy EN8: Clean Vehicle Initiatives and Strategy EN9: Transportation Demand Management Initiatives $MTCO_2$ Reductions

Strategy	2035 Daily Reductions ($MTCO_2$)	2035 Annual Reductions ($MTCO_2$)
Bike Share	7	2,400
Car Share	1,700	599,600
Electric Bike Rebates	150	50,800
Regional EV Charger Network	1,700	600,600
Targeted Transportation Alternatives	1,600	560,600
Vanpool Incentives	150	50,800
Vehicle Buyback Program	3,200	1,123,000
Total	8,600	2,988,000

Notes: $MTCO_2$ = metric tons of carbon dioxide; EV = electric vehicle. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum due to independent rounding. Emissions are annualized by multiplying by 300 to take account for the fact that there is less traffic on weekends.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Table 3.6-15 shows the change in daily and per capita car and light-duty truck CO_2 emissions between 2005 and 2035, the emissions reductions target year under SB 375. Emissions are expected to decline over time with and without the implementation of Strategy EN8 and Strategy EN9. With implementation of Strategy EN8 and Strategy EN9, the proposed plan is expected to result in a 21% decrease in per capita CO_2 emissions from 2005 levels by 2035, exceeding the SB 375 target of 19%. While this decrease in emissions is attributable to numerous factors, the proposed plan's integrated land use and transportation strategies that result in a land use growth footprint that focuses growth into higher-density locations near transit services are particularly effective, as they encourage the shift from driving to public transit and active modes of transportation. This "focused growth" approach allows more efficient use of the existing transportation infrastructure. The integrated land use growth footprint and transportation strategies are described in greater detail in Chapter 2, "Project Description."

Table 3.6-15: Analysis of Passenger Vehicle and Light-Duty Truck CO_2 Emissions Under SB 375[1]

Year	Population	Modeled GHG Emissions ($MTCO_2$/day)	Strategy EN8 and EN9 Reductions relative to 2005 ($MTCO_2$/day)	Emissions per Capita (CO_2 lb per day)	Percent Reduction in Per Capita CO_2 Emissions Relative to 2005	
					Proposed Plan, 2035	Reduction Target Pursuant to SB 375 Target
2005	6,979,000	60,500	n/a	17.35	n/a	n/a
2035	8,524,000	67,000	8,600	13.70	-21%	-19%

Notes: CO_2 = carbon dioxide; $MTCO_2$/day= metric tons of carbon dioxide per day; GHG = greenhouse gas; lb = pounds; SB = Senate Bill. Modeled emissions estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 or EN9 due to modeling limitations. Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.

[1] EMFAC2014 was used to estimate emissions under SB 375, as required by CARB.

Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

As noted, per the requirements of SB 375, the analysis of the proposed plan's consistency with the GHG emissions reductions required by SB 375 does not include emissions reductions associated with ACC II, LCFS standards, or any additional measures from the 2022 Scoping Plan, which are expected to further

reduce CO_2 emissions and result in a decrease in total CO_2 emissions over time. Because the proposed plan would reduce per capita automobile and light-duty truck CO_2 emissions by over 19% by 2035 as compared to the required 2005 baseline, according to the regional targets set by CARB pursuant to SB 375, there would be a less-than-significant impact (LTS).

Conclusion

Because implementation of the proposed plan would reduce per capita automobile and light-duty truck CO_2 emissions by over 19% by 2035 as compared to 2005 baseline, pursuant to the regional targets set by CARB pursuant to SB 375, there would be **less than significant (LTS)** impact. No mitigation measures are required.

Mitigation Measures

- None required.

Impact GHG-3: Conflict with an applicable State plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Implementation of the projected land use growth footprint, sea level rise adaptation projects, and transportation infrastructure improvements under the proposed plan would result in long-term operational emissions of GHGs associated with the combustion of fossil fuels for transportation, operation of landscape maintenance equipment, energy-source emissions from the generation and utilization of electricity and natural gas, water-related energy consumption associated with water use and the conveyance and treatment of wastewater, and waste-generated emissions from the transport and disposal of solid waste. Long-term operational emissions are a function of project-level design. Whether or not individual projects would result in significant levels of GHG emissions would depend on various parameters (e.g., project size, location, design, energy efficiency) that are not known at this time and therefore cannot be quantified on an individual basis.

In addition to area, energy, transportation, water, and waste emissions, the land uses growth footprint under the proposed plan could also accommodate stationary sources of pollutants that would be required to obtain permits to operate in compliance with local air district rules. These sources could include, but are not limited to, the following: diesel engine or gas turbine generators for emergency power generation; central heating boilers for commercial, industrial, or large residential buildings; process equipment for light industrial uses; kitchen equipment at restaurants and schools; service station equipment; and dry-cleaning equipment. The permit process would ensure that these sources would be equipped with the required emission controls, and that individually these sources would not produce substantial emissions.

With respect to stationary sources, emission levels can vary greatly depending on the exact operations and processes involved. Specific information is not available for this program level analysis to reliably estimate these emissions. As stated above, the California Energy Code is updated on a triennial basis, and the next iteration of the code, the 2025 California Energy Code, is projected to reduce statewide GHGs by about 4 million metric tons and would likely be the code in place at the time the proposed plan is adopted (CEC 2024c). As detailed above, AB 130's moratorium on updating the California Building Standards Code for residential development affects the GHG reductions associated with future iterations of the California Building Standards Code, which have historically increased the energy efficiency of buildings. Energy efficiency and renewable energy design features to reduce electricity demand and promote on-site renewable energy associated with future versions for the California Energy Code would not be realized for residential development beyond what is required by the 2025 version of the code.

As discussed under Impact GHG-1, implementation of the proposed plan would result in a net reduction in GHG emissions from transportation sources and would result in more efficient GHG emissions per capita because the projected land use growth footprint would accommodate a greater number of people in the plan area compared to existing conditions. As shown in **Table 3.6-15**, per capita transportation-related emissions are projected to decrease with implementation of the proposed plan, in accordance with SB 375. Additionally, the transportation network improvements and programs under the proposed plan would, in conjunction with the land use growth footprint, result in a regional reduction in per capita VMT for passenger and light-duty vehicles (see Section 3.15, "Transportation"). As stated in the 2022 Scoping Plan, decreasing per capita emissions, especially those related to VMT, is crucial to achieving the State's climate goals (CARB 2022a: 194).

The proposed plan is specifically designed to reduce regional VMT and use of fossil fuel consumption in the transportation and building sectors. Because the 2022 Scoping Plan directs local agencies to take action to reduce VMT, increase ZEV usage, and decarbonize buildings, and therefore contribute to achieving statewide GHG reduction targets, the 2022 Scoping Plan is a GHG reduction plan applicable to the proposed plan. The 2022 Scoping Plan outlines the primary strategies California intends to implement to achieve the legislative GHG emission target for 2030 and provide a pathway toward the State's 2045 climate goals. The 2022 Scoping Plan identifies the reductions needed by each GHG emission sector including transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential, and recycling and waste. The 2022 Scoping Plan lays out the pathway to achieve the State's carbon neutrality goal and reduce anthropogenic GHG emissions by 85% below 1990 levels no later than 2045.

The Local Actions Appendix (Appendix D) to the 2022 Scoping Plan includes various recommendations that local governments can implement to align their planning and development review processes with the State's climate goals. Appendix D recommends that local governments focus on transportation electrification, VMT reduction, and building decarbonization (CARB 2022a). As detailed above, the proposed plan was specifically designed to reduce regional VMT and was prepared pursuant to SB 375. SB 375 seeks to reduce GHG emissions from the passenger-vehicle sector by reducing VMT in developed areas and areas planned for development in the jurisdictions of the State's 18 MPOs. Compliance with the reduction goals of SB 375 is identified in the 2022 Scoping Plan as a necessary component to achieving the short-term goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 as mandated by SB 32.

CARB adopted the most current SB 375 regional GHG reduction targets in March 2018. This includes the MTC and ABAG region's target for GHG emissions reductions of 19% per capita passenger vehicle as compared to 2005 levels by 2035 (CARB 2018). This reduction target adds to the GHG reductions achieved through the implementation of other statewide programs (e.g., Cap-and-Trade, RPS).

Although the proposed plan would be expected to meet the region's SB 375 target of reducing vehicle emissions by 19% by 2035 relative to 2005 levels (see Impact GHG-2, above), recent reports on the State's climate goals suggest that the regional 2035 GHG emissions reduction targets under SB 375 are not adequate to fully meet the GHG reduction goals of SB 32 (CARB 2022b). Collectively, CARB determined that if the State's 18 MPOs' all met the SB 375 GHG emission reduction targets set by CARB in 2018, a 19% reduction in per capita VMT would be achieved by 2035. In *The Updated Final Staff Report to the Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, CARB expressed that to meet the statewide reduction goals set forth by SB 32, the State would need to reduce per capita GHG emissions by 25% by 2035, resulting in a 6% gap between the 19% emissions reductions targets set for the regions (averaged for the 18 MPOs and compared to a baseline year of 2005). Notably, CARB is required to update the reduction targets under SB 375 every 8 years and is currently conducting workshops to solicit input from stakeholders for the next target update planned for 2026.

Further, in the *2022 Progress Report California's Sustainable Communities and Climate Protection Act*, CARB also states that an RTP/SCS that meets the applicable SB 375 targets alone will not result in the GHG emissions reductions necessary to meet State climate goals in 2030 nor in 2050 (CARB 2022b). CARB has also noted that greater reductions in VMT will be required to achieve overall GHG goals. Further, CARB states that California is still not reducing GHG emissions from personal vehicle travel as needed to meet climate commitments and as targeted under SB 375 (CARB 2022b). It will take collaboration among all the levels of government to identify the additional VMT reductions needed to achieve the State's climate goals because MPOs by themselves do not have the land use authority or resources to meet this challenge alone. Additional reductions would be needed in the transportation sector and all other GHG sectors to achieve the goals of SB 32 and AB 1279. The other sectors include how energy is sourced, generated, and used; how solid waste is generated, managed, and disposed of; treatment, conveyance, and uses of water supply and wastewater; energy sources and feedstocks for industrial processes and activities; management of natural and working lands; and uses of high-GWP gases. Achieving GHG reductions from these sectors at the scale required to meet the goals of SB 32 and AB 1279 would require major changes to government regulation, private sector activity, consumer behavior, and other facets of life throughout California and beyond.

In the 2022 Scoping Plan, CARB identifies several pathways for each sector to close the reduction gap needed to achieve the targets of AB 1279. These will be achieved through building decarbonization, reducing the cap of the Cap-and-Trade Program, investing in the health of the State's natural and working lands, and ultimately reliance on carbon capture and sequestration technologies to eliminate residual emissions from those sectors CARB cannot independently regulate or control. The reductions achieved through SB 375 and the efforts of MPOs would contribute to the overall goal of carbon neutrality; however, this regulation is one component of many GHG reduction plans, policies, and actions taken by the State to reduce statewide emissions.

Therefore, without sufficient State legislation and regulation, attainment of State goals is extremely difficult. This would be a potentially significant (PS) impact.

Conclusion

The anticipated land use and transportation emissions under the plan relative to the region's 2023 emissions may conflict with the State's GHG reduction plans under SB 32 and AB 1279. Although MTC and ABAG have developed a set of land use and transportation strategies that exceed SB 375 goals for reducing emissions from passenger cars and light-duty trucks (see **Table 3.6-15**) and place the Bay Area on a downward trajectory in net GHG emissions, CARB has identified that meeting SB 375 goals alone will not meet statewide goals under the 2022 Scoping Plan. This impact is considered **potentially significant (PS).** Mitigation Measure GHG-3 addresses this impact and is described below.

Mitigation Measures

ABAG and MTC do not have authority to require the implementing agencies to adopt the identified mitigation measures but instead shall serve in a supportive role to assist implementing agencies in applying these measures. However, implementation of the following measures or other comparable measures identified by the lead agency at a project-level would reduce impacts related conflict with GHG emissions targets and agencies with jurisdiction to adopt these measures can and should do so (PRC Section 21081).

Mitigation Measure GHG-3 ABAG and MTC, in partnership with air districts in the plan area, shall work with the counties and cities in the plan area to adopt qualified GHG reduction plans (e.g., CAPs), develop GHG-reducing planning policies, and implement local climate initiatives, with the ultimate completion date to be achieved by the proposed plan's horizon year. These reductions can be achieved through a combination of programs, including zero net energy in new construction, retrofits of existing buildings,

incentivizing the development of renewable energy sources that serve both new and existing land uses, and other measures. Notably, the development and implementation of GHG reduction plans would ultimately occur at the discretion of local agencies, counties, and municipalities. Nevertheless, ABAG and MTC shall contribute relevant data and protocols to assist in the development of inventories, forecasts, and GHG reduction strategies.

- Implement Mitigation Measures AQ-3(a) through AQ-3(d), TRA-2(a), and TRA-2(b).

Significance after Mitigation

Although many local jurisdictions in the region have released CAPs, additional implementation of CAPs in the region would continue to help to reduce GHG emissions from the land use projects that would be constructed under the proposed plan, as well as reducing GHG emissions from existing uses. Energy reduction incentive programs, such as those supported by the Bay Area Regional Network, would help reduce GHG emissions from energy usage in existing and new structures in the region. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions.

However, there is no assurance that this level of mitigation would achieve the regional reductions needed to attain the statewide 2030 and 2045 targets. Additional regulatory action that results in substantial GHG reductions throughout all sectors of the State economy and based on State-adopted regulations would likely be needed to attain such goals, and they are beyond the feasible reach of MTC and ABAG and local jurisdictions. Moreover, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measure, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Even with full implementation of the mitigation measure, forecasted emissions would not be reduced to target levels under SB 32 and AB 1279. Therefore, this impact would be **significant and unavoidable (SU).**

Impact GHG-4: Conflict with an applicable local plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The proposed plan's forecasted development pattern is not expected to conflict with any CAPs or general plans of cities and counties located in the proposed plan area, or with any local regulations adopted with the intent to reduce GHG emissions. Section 3.6.2, "Regulatory Setting," above, describes the plans, policies, and regulations relevant to the proposed plan that are related to the reduction of GHG emissions.

Local CAPs or GHG reduction plans are adopted by local jurisdictions to comply with the goals set for local governments in CARB's 2022 Scoping Plan and are therefore designed to support the same State-mandated goals and targets for GHG reduction outlined above. It is ultimately local jurisdictions that determine whether land use development projects are consistent with local plans and policies. MTC and ABAG do not have jurisdiction over land use development projects approval within the region.

Local CAPs are often prepared to include various measures, strategies, or policies to reduce GHG emissions from the transportation and building sectors. To target emissions from the mobile sector, a local CAP may detail actions to reduce VMT and associated emissions from motor vehicles by encouraging active transportation, reducing congestion, increasing transit ridership, and encouraging adoption of ZEVs. The proposed plan is specifically designed to reduce regional VMT and identifies transportation investments for infrastructure including highways, public transportation, bicycle facilities, and pedestrian facilities. The proposed plan would facilitate the implementation of transportation system projects, such as adding new shared-use paths, sidewalks, walkways, bike lanes, and complete streets, and improving existing ones. These investments would help reduce fossil fuel consumption and associated GHG

emissions by advancing the region's climate resiliency, reimagining long-term maintenance challenges, improving multimodal accessibility, and public safety.

Local CAPs also target GHG emission reductions in the building, waste, water, and energy generation sectors. This may be achieved through measures developed to direct future development to become fully electric and renovate existing buildings to be all electric. The land use development footprint identified in the proposed plan does not include policies or direction to use natural gas. Therefore, the proposed plan would not obstruct local CAPs' abilities to decarbonize the building sector. Because the proposed plan targets emission reductions in the transportation sector through infrastructure improvements and land use policies directed at reducing automobile use through construction of compact and mixed-use development, the proposed plan would not interfere with the implementation of CAP policies meant to reduce GHG emissions or promote energy efficiency and renewable energy in other sectors.

Notably, not all local GHG reduction plans will have identical GHG reduction goals and implementation measures. Entities in the MTC and ABAG region are in different stages of the CAP or GHG reduction planning process. As emissions inventories and climate action or GHG reduction plans are prepared and near completion or adoption, jurisdictions would set benchmarks to evaluate the implementation of their plan.

The proposed plan relies on the benefits of dense, compact development coupled with an efficient and diversified transportation network. It seeks to reduce overall and per capita energy consumption and related GHG emissions from all sources. These actions would help to reduce GHG emissions associated with changes in land use and transportation systems at both the local and regional level and, thus, could result in beneficial contributions to localized GHG emissions reductions identified in local plans.

The proposed plan identifies land use strategies that lead to a focused growth land use growth footprint and transportation strategies that would make the regional system more efficient, resulting in reductions to per capita and overall GHG emissions. However, some variations may exist at the local level. For instance, the proposed plan's focused growth pattern may not support an individual jurisdiction's efforts to meet its GHG target because the proposed plan's growth patterns may not constrain growth in that particular jurisdiction. Although some variations may exist between the proposed plan and specific local CAPs, these variations would need to be assessed at the local level. In addition, the proposed plan is not binding; it does not constrain a local jurisdiction from exercising its discretion to make different land use decisions. In general, it is expected that local CAPs and the proposed plan would be complementary efforts toward the reduction of GHG emissions in line with State goals and mandates.

Conclusion

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan are not expected to conflict with local climate action or GHG reduction plans, and the impact is considered to be **less than significant (LTS)**. No mitigation is required.

Mitigation Measures

None required.

Impact EN-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (LTS)

Land Use Impacts

As explained in Chapter 2, "Project Description," the proposed plan integrates 35 strategies to accommodate projected household and employment growth in the nine-county plan area. As shown in **Table 2-3**, in Chapter 2, "Project Description," the proposed plan's 35 integrated strategies would result

in 91% of forecasted new housing units (existing conditions to 2050) to be built as multifamily units compared to single-family homes. This distinction is important because the level of energy consumption associated with both the construction and operation of multifamily units is generally less than for single-family homes (Pesantez et al. 2023). The average multifamily unit has a lower floor-to-area ratio resulting in less ground disturbance during construction and is designed to house more inhabitants per unit of floor area. With fewer exterior walls and more interior walls shared by multiple units, the space heating and cooling of multifamily units is generally more energy efficient than single-family dwelling units.

The proposed plan serves as a comprehensive set of strategies to accommodate forecasted regional growth. The strategies would result in an increase in the building of multifamily units compared to single-family residential dwelling units, as described above. Therefore, as compared to existing conditions, wherein current land use trends remain consistent with existing general plans, per capita energy consumption associated with the proposed plan would be lower due to the increased energy efficiency on a per capita basis of multifamily housing. While total energy consumption is expected to increase for both multifamily and single-family housing types, this projected increase is the result of accommodating the region's forecasted 1 million new households and 1.4 million new jobs between 2020 and 2050 as shown in **Table 2-1** in Chapter 2, "Project Description." As summarized in **Table 2-4** in Chapter 2, "Project Description," the region is projected to accommodate this level of new households with a regional trend toward multifamily housing. Therefore, although overall energy consumption in the region is forecasted to increase, per capita energy consumption is expected to decrease due to the proposed plan's strategies, which results in a more compact land use growth footprint.

Additionally, Strategy EN2, "Provide Means-Based Financial Support to Retrofit Existing Residential Buildings," would result in building ordinances and building retrofits to meet higher energy standards, among other things. Similarly, Strategy EN3, "Fund Energy Upgrades to Enable Carbon Neutrality in All Existing Commercial and Public Buildings," would support the electrification and resilient power system upgrades leading to lower building emissions. Strategies EN2 and EN3 would result in decreased energy demand region-wide.

Individual projects under the proposed plan would be required to comply with the most current regulations outlined in Part 6 (i.e., the California Energy Code) and Part 11 (i.e., CALGreen) of the California Building Standards Code. The California Energy Code regulates the energy consumption of new residential and nonresidential buildings in California is regulated by the California Energy Code's Building Energy Efficiency Standards, while CALGreen includes specific requirements for sustainable construction practices in planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The mandatory provisions of the California Energy Code and CALGreen would apply to construction of land use projects, which would help to minimize waste, water, and energy consumption.

Additionally, AB 130 enacts restrictions on modifications to future iterations of the California Building Standards Code for residential development until 2031. AB 130's moratorium on updating the California Building Standards Code for residential development would affect the GHG reductions associated with future iterations of the California Building Standards Code, which have historically increased the energy efficiency of buildings. Energy efficiency and renewable energy design features to reduce electricity demand and promote on-site renewable energy associated with future versions for the California Energy Code would not be realized for residential development beyond what is required by the 2025 version of the code. Implementation of the proposed plan's land use growth footprint would also require the consumption of gasoline and diesel fuel associated with worker-commute, material-movement, and excavation trips and operation of heavy-duty equipment. The total amount of gasoline and diesel fuel that would be required to complete construction of the land use development projects is unknown at this time due the uncertainty surrounding the magnitude, timing, distance of haul route and worker-commute trips, type of heavy-duty

equipment used, and level of project-level mitigation that could be applied. Although construction of the land use types under the proposed plan would result in gasoline and diesel fuel consumption, this level would be considered necessary to provide adequate housing and commercial, retail, and industrial land use to accommodate the projected increasing in population, housing, and employment that the plan area would realize by 2050. Therefore, this use of energy would not be considered inefficient, unnecessary, or wasteful. For these reasons, this would be a less-than-significant (LTS) impact.

Sea Level Rise Adaptation Impacts

Energy would be consumed during the construction of sea level rise adaptation projects. Gasoline would be consumed from worker-commute trips, and diesel fuel would be consumed from the movement of haul trucks to and from project sites and use of heavy-duty construction equipment. The exact amount of gasoline and diesel fuel use is unknown at this time because the magnitude, timing, and the type of heavy-duty construction equipment used is unknown. This consumption would be inherently short-term and would facilitate the construction of adaptation projects that would improve the resiliency of the plan area to rising sea levels. Moreover, energy-related infrastructure could be located in areas that are vulnerable to sea level rise. Therefore, the adaptation projects would improve the resiliency of electrical and natural gas infrastructure (see Impact PUF-1 in Section 3.14, "Public Utilities and Facilities").

Sea level rise has been identified as a major secondary climate change impact that will greatly affect the San Francisco Bay Area. Sea level has risen approximately 20 centimeters over the last 100 years, and depending on future GHG emissions scenarios, sea level along the California coast would rise by 0.74 to 54 inches by 2100 (LCI et al. 2018). Therefore, while energy would be consumed in the form of gasoline and diesel fuel for construction of sea level rise and resiliency projects, this consumption would be necessary to bolster the resiliency of the plan area to future inundation by rising rides. Therefore, because this energy consumption would not be considered unnecessary, the energy associated with sea level rise and resiliency projects would be less than significant (LTS).

Transportation System Impacts

The proposed plan is designed to increase the efficiency of transportation in the region by reducing per capita VMT in passenger vehicles and light-duty trucks. Therefore, the proposed plan would inherently increase the energy efficiency of mobility in the region. As shown in **Table 3.6-8 and Table 3.6-9**, implementation of the proposed plan would result in a decrease in gasoline consumption and an increase in diesel consumption per year under both the EMFAC2017 and EMFAC2021 scenarios. The decrease in gasoline consumption is attributable to increasing fuel efficiency standards on passenger vehicles and light-duty trucks. The projected increase in diesel consumption is attributable to a projected increase in the level of VMT by diesel-powered heavy trucks in the region. As shown in **Table 3.6-8**, implementation of the proposed plan would result in reduced consumption of automotive fuel by approximately 751,000 gallons per day, as estimated using EMFAC2021. **Table 3.6-9** identifies that implementation of the proposed plan would result in reduced consumption of automotive fuel by approximately 580,000 gallons per day, as estimated using EMFAC2021.Much of this decrease in gasoline and diesel consumption would be due to the improved energy efficiency of automobiles from more stringent emission and fuel efficiency standards established by CARB. Notably, as stated in Section 3.6.2, "Regulatory Setting," House Joint Resolution 88, enacted by Public Law No. 119-16, rescinds the State's ability to enforce the ACC II regulation. As described in the methodology, recent State legislation that could not be accounted for in modeling is expected to provide additional reductions to these values.

Notably, **Table 3.6-8 and 3.6-9** do not account for implementation of strategies EN8 or EN9, which would result in an additional reduction in the consumption of gasoline and diesel fuel from passenger cars. It is foreseeable, then, that the reductions identified in **Table 3.6-8 and Table 3.6-9** underrepresent the actual fuel reductions that would be achieved in 2050 through implementation of the proposed plan and its associated strategies. Therefore, this is a less-than-significant (LTS) impact.

Conclusion

Construction and operation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects would not result in the wasteful, unnecessary, or inefficient use of energy because the energy associated with these projects would be serving necessary regional needs, would be subject to plan strategies that result in increased efficiency, and would comply with applicable regulations and standards (e.g., RPS, California Energy Code). Therefore, energy impacts would be **less than significant (LTS).**

Mitigation Measures

None required.

Impact EN-2: Conflict with or obstruct a State or local plan for renewable energy or energy efficiency (LTS)

Land Use Impacts

Individual projects related to regional growth and land use change under the proposed plan would be required to comply with the most current regulations outlined in Part 6 (i.e., the California Energy Code) and Part 11 (i.e., CALGreen) of the California Building Standards Code. The California Energy Code regulates the energy consumption of new residential and nonresidential buildings in California and is regulated by the California Energy Code's Building Energy Efficiency Standards. CALGreen includes specific requirements for sustainable construction practices in planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The mandatory provisions of the California Energy Code and CALGreen would apply to construction of land use projects, which would help to minimize waste, water, and energy consumption. As stated in Impacts GHG-1 and GHG-3, AB 130 enacts restrictions on modifications to future iterations of the California Building Standards Code for residential development until 2031. AB 130's moratorium on updating the California Building Standards Code for residential development would affect the GHG reductions associated with future iterations of the California Building Standards Code which have historically increased the energy efficiency of buildings. Energy efficiency and renewable energy design features to reduce electricity demand and promote on-site renewable energy associated with future versions for the California Energy Code would not be realized for residential development beyond what is required by the 2025 version of the code.

The proposed plan would not conflict with the goals of the 2022 Scoping Plan because the land use growth footprint would, in conjunction with the transportation projects, result in a regional reduction in per capita VMT for passenger and light-duty vehicles, as discussed in in Section 3.15, "Transportation." In the 2022 Scoping Plan, CARB calls for a statewide VMT reduction, which would directly result in a decrease in gasoline and diesel fuel use, which the proposed plan would achieve in alignment with the targets of SB 375. Therefore, because the proposed plan would reduce per capita fossil fuel usage, it would not conflict with the energy goals of the 2022 Scoping Plan as it pertains to on-road vehicle energy.

The land uses constructed under the proposed plan would also be subject to the energy and GHG reduction policies of a general plan and CAP, if applicable. Many local general plans and CAPs include policies that encourage energy conservation and energy efficiency in new buildings. Typically, CAPs include various measures and actions to reduce GHG emissions by sector consisting of, but not limited to, transportation, energy, solid waste, water and wastewater, and carbon sequestration.

Other examples of local CAP measures that reduce GHG emissions include renovations to existing buildings to be more energy efficient, deployment of solar PV to existing and new residential and nonresidential buildings, additional waste diversion goals exceeding statewide requirements, capture and control of landfill gas emissions, improved water efficiency in existing and new residential and

nonresidential development, and tree planting to increase carbon sequestration. These implementing actions would be outside of the scope of the proposed plan and MTC and ABAG's direct authority and therefore, their implementation would not be impeded or obstructed by implementation of the regional growth and land use changes and programs included in the proposed plan.

The projected land use growth footprint included in the proposed plan would not conflict with the applicability of those plans and policies to future development within the proposed plan area.

Implementation of the proposed plan's land use growth footprint would not conflict with or obstruct State or local plans for increasing renewable energy, including the California Energy Code, SB 1020, local CAPs, or applicable sections of local general plans. The projected land use growth footprint would be subject to the most recent iteration of the California Energy Code, which requires that single-family residential development include solar photovoltaics. The percent of renewable or GHG-free electricity provided in the region would increase from 2022 through 2035 based on the SB 1020 RPS targets (i.e., 90% clean energy by 2035 and 95% clean energy by 2040), resulting in a reduction in use of nonrenewable energy resources. The land uses constructed under the proposed plan would also be subject to the renewable energy policies of a general plan and CAP, if applicable. The forecasted development pattern included in the proposed plan would not conflict with the applicability of those policies to future development in the proposed plan area. Therefore, the proposed plan's regional growth and land use changes would not conflict with or obstruct a State or local plan for increasing renewable energy or energy efficiency.

Implementation of the proposed plan's forecasted development pattern would not conflict with or obstruct a State or local plan for increasing renewable energy or energy efficiency. The proposed plan would result in development or redevelopment to accommodate the regional growth forecast of households and jobs, thereby increasing the demand for electricity and natural gas. However, as discussed in Chapter 2, "Project Description," the proposed plan's land use strategies are directed at reducing automobile use through construction of compact and mixed-use development in areas that offer transportation choices such as walking, biking, and transit. Implementation of the projected land use growth footprint developed for the proposed plan would be subject to the GHG reduction policies of a CAP, where applicable. At the time of writing this EIR, many cities and counties in the region have CAPs, GHG reduction plans, or sustainability plans that include policies to increase the use of renewable energy throughout the region. The proposed plan's forecasted land use growth footprint would not conflict with the applicability of the policies of a local or regional CAP or any other plan that serves to reduce GHG emissions or energy consumption to future development within the plan area. Therefore, this would be a less-than-significant (LTS) impact.

Sea Level Rise Adaptation Impacts

Sea level rise adaptation projects would require the use of energy during construction phasing, as discussed in greater detail above under Impact EN-1. State and local plans target increasing energy sourced from renewables or improving energy efficiency target operational energy consumption. Operation of sea level rise adaptation projects would not have a large operational energy budget, if any. Therefore, the need for renewable energy would not be required. This would be a less-than-significant (LTS) impact.

Transportation System Impacts

The proposed plan would reduce dependence on petroleum products and increase reliance on renewable energy. For example, the proposed plan's strategies would result in the automobile mode share to decrease as a share of all trips, and instead shifting to more sustainable active transportation modes. Strategy EN8, "Expand Clean Vehicle Initiatives," would expand investments in clean vehicles and relocate energy derived from petroleum combustion to the electricity grid, which, as discussed in 3.6.1, "Regulatory Setting," would be sourced by a greater portion of renewable energy as a result of SB 1020

and the RPS. Although VMT would ultimately go up by 2050, statewide regulatory mechanisms, such as the ZEV Action Plan, SB 1020, and RPS, would minimize the amount of fuel consumed from automobiles as the transportation system is electrified and the energy sector becomes increasingly more renewable. The proposed plan would not conflict with the goals of the 2022 Scoping Plan as the transportation network improvements and programs would, in conjunction with the land use growth footprint, result in a regional reduction in per capita VMT for passenger and light-duty vehicles (see Section 3.15, "Transportation"). In the 2022 Scoping Plan, CARB calls for a statewide VMT reduction, which would directly result in a decrease in gasoline and diesel fuel usage, which the proposed plan would achieve in alignment with the targets of SB 375. Therefore, because the proposed plan would reduce per capita fossil fuel usage, it would not conflict with the energy goals of the 2022 Scoping Plan as it pertains to on-road vehicle energy. Transportation projects developed for the proposed plan would not conflict with the implementation of the aforementioned regulations and statewide plans.

The Warren-Alquist Act established a State policy to reduce wasteful, uneconomical, and unnecessary uses of energy. As shown in **Table 3.6-8 and 3.6-9**, total gasoline consumption, the primary on-road vehicle fuel in the region, would decrease between existing conditions and 2050 under both modeling scenarios. As explained in the impact analysis of Impact EN-1, the proposed plan would not result in wasteful, inefficient, or unnecessary use of energy. Therefore, the proposed plan is consistent with the Warren-Alquist Act policies.

City and county policies derived from general plans, CAPs, or any other a plan that seeks to reduce GHG emissions would apply to transportation infrastructure in the plan area. It is common practice for CAPs to develop local measures to reduce gasoline and diesel fuel consumption, which directly results in decreased emissions of GHGs. Implementation of the proposed transportation system improvements would not interfere or conflict with any local or regional plan that serves to reduce gasoline and diesel consumption. For example, CAP policies that seek to improve the region's EV infrastructure would continue to apply with implementation of the proposed plan. Therefore, this would be a less-than-significant (LTS) impact.

Conclusion

Implementation of the proposed plan itself would result in the densification of land use, increased energy efficiency from residential uses, a net reduction in the consumption of automotive fuel, and increase reliance on renewable energy sources. Therefore, this impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

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3.7 CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

This section evaluates the potential cultural resource impacts resulting from the implementation of the proposed plan. Cultural resources generally are the material remains of human activity identified with either the precontact inhabitants of the area (any time before the arrival of the Spanish in the latter half of the 18th century) or with the historic inhabitants. The historic period begins with the arrival of the Spanish.

Cultural resources in the Bay Area reflect centuries of human settlement in the region and document the changing character of economic, social, and spiritual activities. They include precontact resources, historic-period resources, and tribal cultural resources (the latter as defined by Assembly Bill [AB] 52, Statutes of 2014, in PRC Section 21074), as well as sensitive locations where resources are likely to be identified in the future based on our existing knowledge of historic and precontact settlement patterns. Archaeological resources are locations where human activity has measurably altered the earth or left deposits of precontact or historic-era physical remains (e.g., stone tools, bottles, former roads, house foundations). Historical (or built-environment) resources include standing buildings (e.g., houses, barns, outbuildings, cabins) and intact structures (e.g., dams, bridges, roads, districts), or landscapes. Tribal cultural resources generally are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe.

Comments received in response to the Notice of Preparation included regulation information related to tribal consultation and the requirements of AB 52. Tribal consultation under AB 52 is described below.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.7.1 Environmental Setting

PRECONTACT SETTING AND ETHNOGRAPHY

The moderate climate, combined with the abundant natural resources found throughout the nine-county region, has supported human habitation for several thousand years before current era (BCE). Some theories suggest that the precontact bay and river margins were inhabited as early as 10,000 years ago. Rising sea levels, the formation of the San Francisco Bay, and the resulting filling of inland valleys have covered these early sites, which were most likely located along the then existing bay shore and waterways. Existing evidence indicates the presence of many village sites from at least 3,000 years BCE in the region. The arrival of Native Americans into the Bay Area is associated with documented cultural resources from circa 3,500 BCE (US Department of the Interior 1990).

Six different groups of Native population, identified by their language, lived within the Bay Area: Ohlone (Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, and Solano Counties), Bay Miwok (Contra Costa County), Patwin (Napa and Solano Counties), Coast Miwok (Marin and Sonoma Counties), Pomo (Sonoma County), and Wappo (Napa County). These native populations periodically increased between 3,000 BCE and the arrival of the Spanish in the late 18th century. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches because of the seasonal nature of their subsistencebase.

By 1,500 current era (CE), population densities had grown to the point where less favorable environmental settings were being used for habitation. Traditional tribal territorial boundaries thus usually overlap; this is particularly the case in the South Bay. Groups competed for hunting grounds, seed and acorn gathering areas, and other areas necessary to a hunting-and-gathering culture. Remains of these early peoples indicate that main villages, seldom more than 1,000 residents, were usually established along water courses and drainages. Remains of satellite villages have been found in areas used for the procurement of food or other resources. By the late 1760s, about 300,000 Native Americans lived in California (San Francisco Estuary Partnership 2016).

Ohlone

The Ohlone languages belong to the Utian family of the Penutian language stock and were spoken in a large area extending from the San Francisco Bay Area southward along the coast to Point Sur and inland to the Diablo Range and portions of the northern San Joaquin Valley. The basic Ohlone political unit was the "tribelet," an autonomous, self-governing, territorially defined unit over which recognized authority was given to one person, in most instances the leader or chief. Each tribelet was composed of one or more villages and a number of camps within its recognized and protected resource exploitation zone. Because of geographic barriers and distance between Ohlone tribelets, however, the integration of smaller political units into larger ones was the exception rather than the rule among the Ohlone (Pacific Legacy 2016).

Regional interaction among the Ohlone, and with neighboring cultures, such as the Salinan and Yokuts, took place through trade, ceremonies, warfare, and intermarriage. Shell beads were widely used by the Ohlone as a form of currency in exchanges. Olivella shells, mussels, abalone shells, salt, dried abalone, woven baskets, and other items were traded for prized goods with nearby villages and with more distant villages located in dissimilar environmental zones. Among the items received by the Ohlone in such transactions were stores of the prized piñon nut and obsidian for tool-making (Pacific Legacy 2016).

The Spanish colonization of the region was accomplished through the introduction of the Hispanic mission system. Starting with Mission San Carlos and the Presidio of Monterey in 1770, several other missions were established over the next 30 years, each exerting their influence over the native people of the plan area. The subjugation of the native people resulted in dramatic environmental changes after they could no longer influence the native landscape, while poor nutrition and repeated exposure to introduced European diseases and violence served to decimate the Ohlone. Ultimately, the people affiliated with the plan area were dispersed among other tribesmen at Missions Santa Clara, San Juan Bautista, and Santa Cruz. Nonetheless, many survived, and their descendants continue to live in the region (Midpeninsula Regional Open Space District 2014).

Bay Miwok

The Bay Miwok are known to have occupied the interior valleys of the East Bay, perhaps extending as far as the shoreline in the vicinity of present–day East Oakland, at least since 300 CE, though their presence may date back as far as 2500 BCE. Although mutually unintelligible, the Ohlone, Bay Miwok, and Coast Miwok languages all derive from Utian stock. Like other west–central California Native American groups, the Bay Miwok were organized into autonomous territorial political groups. Each territorial group was a community of interrelated families; the size of most tribelet populations ranged between 200 and 400 people. The small villages were generally located near sources of fresh water, such as creeks and springs, though they were also found on alluvial flats and along the first set of ridges between valleys and mountain ranges.

Infiltration of Europeans into the Bay Area rapidly led to the decimation of the Bay Miwok people. They were forced into servitude on the Spanish missions and large "rancherias" in northern Alameda and Contra Costa Counties. Disease and overwork, as well as conflicts with other tribal groups, led to their decline. By the beginning of the American historical period (1848), the Bay Miwok had ceased to exist as an ethnic or linguistic entity (Contra Costa County 2009: 4.D-3).

Patwin

The Patwin are Wintuan speakers. The Wintuan language is part of the larger Penutian language family, which also includes Miwok, Maidu, Ohlone, and Yokuts. The Patwin were organized into tribelets consisting of a primary village and several smaller associated villages. Numerous ethnographic village locations were reported for the Patwin; villages were located along the Sacramento River and all major drainages that drain the eastern and southern slopes of the Coast Ranges, including Putah, Ulatis, and Suisun Creeks. Permanent houses, typically of the semisubterranean type, usually sheltered more than one household, each occupying different sides of the dwelling. Temporary shelters were often seasonally occupied when families were away from the permanent winter village. These temporary shelters, primarily used for protection against the summer sun and infrequent rains, consisted of a brush-covered shed, four corner posts, and a flat roof.

In the late 18th and early 19th centuries, Spanish missionaries, and European and American trappers and explorers, entered northern California. Spanish emissaries from Missions San Francisco de Asis, San Francisco Solano, and San Jose actively proselytized the Patwin people. The earliest historic records, beginning around 1800, consist of Spanish mission registers of baptisms, marriages, and deaths of Indian neophytes. During the 1830s and 1840s, the Patwin territory was taken over by Mexicans and Americans. By the 1860s, the few Patwin who had survived almost 100 years of epidemics and conflict with the Spanish, Mexican, and Euro-Americans either worked as laborers for ranches or were placed on small reservations established by the United States government.

Mission records provided tribelet names and locations. The Malacas lived east of today's Fairfield, on the plains of the north side of Suisun Bay. They had close ties with the Suisuns, who also resided in the vicinity of Fairfield. The Malacas moved to Mission Dolores from 1810 until 1816, at the same time as the Suisuns, and the Malacas may have been assumed to be Suisuns. The Tolenas, who lived in Green Valley north of the Suisun Plain, moved to Mission Dolores from 1815 until 1820. Nineteen Tolenas also moved to Mission San Jose. The Ululato, who lived in the vicinity of today's Vacaville, moved to Mission Dolores from 1815 until 1822, then to Mission San Francisco Solano from 1824 to 1833 (Solano County 2008: 4.10-4 through 4.10-6).

Coast Miwok

Before the arrival of Europeans to the San Francisco Bay Area, Coast Miwok territory included the entire Marin Peninsula and stretched as far north as Duncan's Point and as far east as Sonoma. Linguistically, Miwok is one of the Penutian languages. Precontact population estimates for the Coast Miwok suggest that population density was low, with perhaps as few as 2,000 people living in the entire area. The settlement patterns of the Coast Miwok, similar to other native groups in the region, were largely dictated by the seasonal availability of important food resources. During the warmer summer months, villages were occupied along rivers, estuaries, and the coast. Winter villages were often located further inland and contained semi-permanent structures and food storage facilities.

The first contact between Coast Miwok and Europeans occurred over 400 years ago, presumably in 1579 when Sir Francis Drake made landfall somewhere in Coast Miwok territory. Drake remained in the area for 6 weeks marked by a number of amicable interactions with the local people. Sixteen years later, Sebastian Cermeño landed in what is today known as Drakes Bay. His galleon, the *San Agustin*, was wrecked by a storm, forcing Cermeño and his men to make the return trip to Acapulco by launch. Even before they left, however, the Coast Miwok began salvaging items from the larger vessel, and the Chinese porcelains and metal objects they recovered have been noted in archaeological assemblages from throughout the area (Marin County 2011: 218).

Pomo

Groups speaking two closely related Pomoan languages, Southwestern Pomo and Southern Pomo, held most of the area that was to become Sonoma County. The Southwestern Pomo (Kashia/Kashaya)

occupied about 30 miles of the northwestern Sonoma County coast, extending inland up to 13 miles. This territory consisted primarily of rocky coastline and unbroken redwood forest. Village sites were situated along the coast and on inland ridges. The principle village was located near Fort Ross, where the main residences of the headmen and women were located. Other large principle villages and smaller subsidiary villages supported an estimated 1,500 people.

The history of the Kashia differs from that of other Pomo-speaking tribes in that their first direct contact with nonnative peoples was not with Spaniards, Mexicans, or Euro-Americans but rather with Russians. The Russian colony at Fort Ross operated from 1812 to 1842, and as a result many Kashia Pomo escaped missionization. When the Russians left, Mexican and Euro-Americans began to settle the coast and forced changes to the Kashia's traditional way of life. Beginning in the 1870s, they lived in three villages, two of which were located on property owned by Charles Haupt, who was married to a Kashia woman. In 1914, Haupt petitioned the US government on behalf of the Kashia for a 40-acre parcel near Stewarts Point.

The Southern Pomo territory spanned an area from the coastal town of Gualala, east to Cloverdale, and south toward Healdsburg, Santa Rosa, and Sebastopol. Three tribal units of the Southern Pomo occupied the region: the Kataictemi, the Konhomtara, and the Bitakomtara. The Southern Pomo were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures. They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied continually throughout the year, and other sites were visited to procure particular resources that were especially abundant or available only during certain seasons. Sites often were near freshwater sources and in ecotones where plant life and animal life were diverse and abundant (Sonoma County 2006: 4.10-2, 2008: 3.6-2, 2010: 4.8-3).

Wappo

Wappo is a dialect of the Yukian language, which also includes Yuki, Coast Yuki, and Huchnom. Wappo is the name given to Wappo-speaking people by the Spanish. Wappo is derived from the Spanish word "guapo," which may be translated as brave or handsome. The Spanish considered Wappo to be brave because of their resistance to Euro-American incursion in Napa Valley during the 18th and 19th centuries. Wappo dialects were spoken in a territory that consisted of two divisions. The smaller division existed in a 5-square-mile territory south of Clear Lake. The larger division extended from just north of Napa and Sonoma in the south to Cloverdale and Middletown in the north.

Mission records reveal that Wappo unsuccessfully battled the Spanish; Wappo from villages at Canijolmano, Caymus, Chemoco, Huiluc, Locnoma, Mayacama, and Napa were brought to the mission at Sonoma between 1823 and 1834 to be used for labor. In 1854, the Wappo of the Russian River Valley, whose population likely included Wappo from territories within Napa County, were moved to a reservation in Mendocino. The population of Wappo in Napa Valley in 1855 is estimated to be 500. By 1856, nearly half the Wappo moved to Mendocino had died. The reservation was closed in 1867.

Wappo used stone in almost every aspect of their lives. Napa Glass Mountain, a regionally important obsidian site and quarry, and other local obsidian sources are located within Wappo territory. Other major obsidian sources are near Wappo territory (i.e., Borax Lake, Mount Konocti, and Annadel). Obsidian was used for projectile points, knives, scrapers, drills, and many other tool types. It was a valuable commodity in regional trade networks and provided Wappo with a resource that could be traded for a variety of resources. Chert, found naturally throughout the north Coast Ranges, was also used for a wide range of tools, including projectile points, knives, scrapers, and cobble tools. Basalt was also used for tool manufacture, but it was not the preferred material. Bone tools were also used for awls, needles, whistles, and perforators. Wappo traded with their neighbors for a variety of goods, such as marine shells, fish, and salt (Napa County 2007: 4.12-4).

HISTORIC SETTING

The arrival of the Spanish and the development of the mission system in the latter half of the 18th century permanently disrupted the indigenous societies flourishing in the area. Native American settlements were abandoned and replaced with agricultural land, housing, and military support for the missions. The San Francisco Mission (Mission San Francisco de Asisi or Mission Dolores) and the Presidio (Yerba Buena) were founded in 1776. Both the Mission Santa Clara and the Pueblo de San José de Guadalupe were founded in 1777 in Santa Clara County.

After the Mexican revolt against Spain in 1822, California lands came under Mexican rule, and large tracts of land, including the former missions, were granted to individual owners. It was during the Mexican era that most of the historic ranchlands and associated living quarters and operational structures originate. Mexico ceded control of California to the United States at the end of the Mexican-American War (1846–1848), and the discovery of gold in the late 1840s brought thousands of prospectors and settlers into California. The Bay Area became the gateway to the gold of the Sierra Nevada, with rapid growth occurring in several of the region's fledgling cities, focusing in San Francisco as a shipping and financial center.

An era of increased agricultural production followed the Gold Rush, with much of the region's inland valley natural grasslands plowed for wheat, orchard, and vegetable cultivation. Construction of levees in the Sacramento–San Joaquin Delta reclaimed wetland areas for field crops and orchards, and lumbering, begun during the Gold Rush to supply mining operations, continued to supply a growing population. The expansion of the Transcontinental Railroad in San Francisco in 1888 assured the Bay Area's continued prominence as an economic and population center for the West in general and for California.

In the early 1900s, the Bay Area's economic base continued to grow and diversify, with a maritime industry developing around the San Francisco Bay and manufacturing, trade, and the lumber industry aiding in the growth and development of the region. Urban areas continued to grow in accordance with transportation corridors. The rail lines of the early 1900s supported new development along their routes, with residential and commercial centers at their stops. The arrival of the automobile and roadway construction allowed population and economic centers to develop in more dispersed patterns throughout the region.

Alameda County

Spanish settlement occurred in the 18th century when Juan Bautista de Anza led an expedition of the area. Spanish settlers later constructed Mission San Jose, which is located in present-day Fremont. Mexico gained control of the area after it achieved independence from Spain. As a result of the Mexican-American War, the area became a part of the United States in 1848, and in 1853 the boundaries of Alameda County were formed. The Gold Rush and the various economic opportunities that resulted from it brought Dutch, Anglo, and Portuguese immigrants in the mid-19th century. The unincorporated areas of Alameda County remained largely rural until the post-World War II period, when the communities of Ashland, Castro Valley, Cherryland, Fairview, Hillcrest Knolls, and San Lorenzo were transformed into suburban bedroom communities to accommodate population growth arising from the "baby boom" and influx of people to the area seeking work (Alameda County 2016).

Contra Costa County

Settlement by nonnative Americans did not begin until after the Mexican government began awarding land grants to prominent Mexican citizens in the late 1820s. Contra Costa County was one of the original 27 California counties when California became a state in 1850. Its boundaries included what is now Alameda County until 1852.

Until the 1960s, Contra Costa County's population was greatest along the shorelines of San Francisco and Suisun Bays, with shipping ports and rail lines creating jobs and the need for housing. In the valleys of central Contra Costa County, farming and ranching dominated the landscape and economy. After World War II, residential commuter suburbs began to expand. In the past 45 years, Walnut Creek, Concord, and San Ramon have become major business and retail centers called "edge cities." The population of central and east Contra Costa County has nearly doubled since 1970 (Cerny 2007: 339).

Marin County

Marin was not settled by the Spanish until 1817, when Mission San Francisco de Asis built Mission San Rafael Archangel, a hospital mission and refuge. With the exception of the areas along the coast, which were reserved for the military, today's Marin County belonged to Mission San Rafael. Beginning in 1834, the mission lands were subdivided into 21 Mexican ranchos.

When California became a state in 1850, Marin was divided into the townships of Sausalito, Bolinas, Novato, and San Rafael. Ranching and lumber were the foundations of Marin's early economy. John Reed built a sawmill in Mill Valley by 1834 and James Ross logged the area until his death in 1862. Logging on the west side of Mount Tamalpais began in 1851, and the Bolinas Wharf was established to provide berthing for the sloops that would carry the lumber to San Francisco.

The first railroad to operate in Marin County was the San Rafael & San Quentin Railroad in 1870; the second was the North Pacific Coast Railroad, which began operation in 1875 and ran from Sausalito to Tomales. The North Pacific Coast Railroad eventually expanded up to Duncan Mills on the Russian River, over to San Anselmo, and down to San Francisco. The railroad eventually became the Northwestern Pacific.

The Golden Gate Bridge was opened in 1937; however, the commuter suburbs did not grow until after World War II. After the filling and draining of the creeks and marshes on either side of US Highway 101, the commercial developments began to appear along the highway in the 1950s, replacing the dairy ranching in the area (Cerny 2007: 459–461).

Napa County

The first non-Spanish settler in the Napa Valley area was George Calvert Yount. A North Carolina native, Yount was hired in 1833 to repair the buildings at the San Rafael and Sonoma missions and to complete carpentry work for Mexican General Mariano Vallejo. Yount became a Mexican citizen and was subsequently awarded Rancho Caymus in 1836 and Rancho La Jota on Howell Mountain in 1843, comprising 11,814 and 4,454 acres, respectively, where his business enterprises included a flour mill and sawmills.

Rancho Caymus, located in central Napa Valley in Wappo territory, included the northern fringe of the town of Yountville, which was named after Yount. The 8,865-acre Mexican land grant was awarded in 1841 by Governor pro-tem Manual Jimeno to Cayetano Juárez. Juárez was a California native and had served in the military under General Mariano Vallejo between 1828 and 1836. He was appointed mayordomo at Sonoma in 1836 and was elected alcalde of Sonoma in 1845. An adobe house built by Juárez circa 1847, now operated as a restaurant, stands today at the junction of Soscol Avenue and Silverado Trail.

Many emigrant American families settled in the Napa Valley region between 1840 and 1845. In 1847, the grid for Napa City was laid out by John Grigsby and Nathan Coombs on property they had acquired from Nicholas Higuera's Rancho Entre Napa. Napa County was established in February 1850 and is one of California's original 27 counties. The City of Napa was incorporated in 1874 and has always been the county seat. The county and the city prospered in the wake of the Gold Rush as ranching, farming, and local businesses flourished. The Napa Valley Railroad was completed in 1865 and was extended to Napa Junction (now American Canyon) in 1869. After 1905, interurban rail service linked the city to Vallejo, San Francisco, and the Bay Area.

Napa Valley's world-renowned viticulture industry began with the Spanish padres, who established the final and northernmost Spanish mission (San Francisco Solano de Sonoma) in 1823 at what is now the town of Sonoma. The industry became well established when Charles Krug started making large quantities of wine in the late 1850s and early 1860s. The Charles Krug facility remains the valley's oldest operating winery. Also located in St. Helena, the Christian Brothers vintners built one of the world's largest stone wineries in 1889. By the end of the 19th century, there were more than 140 wineries in the valley (Natural Investigations Company 2016: 14–15).

San Francisco County

Nonnative explorers, settlers, and colonists began to arrive on the San Francisco Peninsula in the late 18th century. The government of Spain established a military outpost, or *presidio*, at the northern tip of the peninsula near the mouth of San Francisco Bay in 1776. Concurrently, Catholic missionaries of the Franciscan order established the sixth *misión* in a chain that would eventually number 21 along the California coast. The permanent chapel of the Mission San Francisco de Asis (Mission Dolores) was completed in 1791 near present-day 16th and Dolores Streets. When Mexico won independence from Spain in 1821, Mexico secularized the missions and conferred vast, private rancho tracts across the entire San Francisco Peninsula and beyond. By 1835, a small civilian commercial port settlement, the Pueblo of Yerba Buena, was established in the area of California and Montgomery Streets, initially supported by the export of California hides and tallow and the import of goods from the eastern United States and Europe.

In 1847, during the Mexican-American War, the United States changed the name of the settlement from Yerba Buena to San Francisco. The settlement changed dramatically with the discovery of gold in the Sierra Nevada foothills. San Francisco was the harbor closest to the strike, and by 1849 the city was growing exponentially. The population grew from 400 in 1848 to approximately 35,000 in 1852. The City boundary line was sequentially expanded southward and westward, ultimately reaching its current location (and merger with the county line) in 1856.

On April 18, 1906, a massive earthquake struck San Francisco. The city's reconstruction, despite occurring without central planning or leadership, resulted in modernization of the financial and industrial bases, densification and expansion of residential neighborhoods, wholesale social and economic reorganization of the city, and ultimately a new San Francisco.

A nationwide economic surge during the 1920s correlated with another building boom in San Francisco, as well as the enacting of the city's first planning code in 1921, mandating the geographic separation of land uses. The opening of streetcar tunnels in 1918 and 1928, and the adoption of mass automobile use beginning in the 1920s, spurred residential development in outlying areas of the city. During the 1930s and the economic downturn of the Great Depression, the city was provided with some of its finest public works projects. Major structures, such as the San Francisco–Oakland Bay Bridge, the Golden Gate Bridge, Coit Tower, Rincon Annex, Aquatic Park, and numerous firehouses, libraries, police stations, and schools, were constructed with the aid of New Deal federal funds.

After World War II, many military personnel and wartime workers stayed in San Francisco, swelling the population and prompting more residential construction in outlying areas where land was still available. The 1950s and 1960s brought federally funded, locally implemented urban renewal to San Francisco. Urban renewal projects cleared large sites in the city's core and redeveloped them with highly programmed landscapes. The downtown area experienced dramatic growth in the 1970s and 1980s, driven by booming markets for office and commercial space. Mass transit was improved by completion of the Bay Area Rapid Transit regional rail system under Market and Mission Streets, and by a parallel Market Street subway for the city's local streetcar lines.

As the 20th century drew to a close, San Francisco's vast postindustrial districts located south of the downtown core, long underutilized and subject to deterioration, became the focus of physical redevelopment. New demands for housing, commercial, and institutional space initiated transformations of former warehouses and factories, railyards, and shipping facilities into high-density urban neighborhoods replete with public services and amenities (San Francisco Planning Department 2009).

San Mateo County

After the mission lands were secularized in 1835, 17 land grants were carved out of what would become San Mateo County. The southern hill country between Woodside and Redwood City became a significant area for logging operations after gold was discovered in 1848, and early San Mateo industries focused on providing San Francisco with resources: agriculture, lumbering, oyster cultivation, shrimp fishing, whaling, and waterworks. After the completion of the San Francisco/San Jose Railroad in 1864, San Mateo County became the first railroad suburb west of the Mississippi where the elite of San Francisco's industrial and commercial circles established country estates. Large suburban estates, not subdivided until the first third of the 20th century, retarded growth and gave San Mateo County a distinctive character.

The 20th century brought considerable growth to San Mateo County. After the 1906 earthquake, there was a large migration to the peninsula. A newly constructed streetcar system from San Francisco all the way to San Mateo allowed the hamlets along the line to become home to a new middle-class suburbanite. The affordability and popularity of the automobile through the 1920s added to this growth. However, it was World War II that had the greatest impact on the built environment. San Francisco International Airport, termed a "mud hole" before the war, was improved to such an extent by the US Army that it was handling one-tenth of all air traffic in the United States by 1946. Supporting businesses sprang up nearby. Partially because of the growth of the airport, a wartime electronics industry exploded onto the scene (Cerny 2007: 117–119).

Santa Clara County

For 75 years, the mission, pueblo, and an evolving rancho system developed under Spanish and then Mexican rule, transforming the fertile Santa Clara Valley into a frontier agricultural region that exported beef and hides to world markets. After California's admission to the United States, Santa Clara County gained a worldwide reputation as an important agricultural region known as the "Valley of Heart's Delight." During the Gold Rush, the city of San Jose served as one of the supply centers for hopeful miners. Sawmills established in the Santa Cruz Mountains utilized an abundance of old-growth redwood that fueled construction in the valley until the beginning of the 20th century.

A railroad was completed from San Francisco to San Jose in 1864, and distribution of Santa Clara County's agricultural products was further facilitated with a regional connection to the Transcontinental Railroad in 1869. By the late 1880s, fruit orchards supplanted grain as land was subdivided into smaller parcels. During the early 20th century, large canneries and packing plants were built to process the abundant production of fruit.

World War II also had a major effect on Santa Clara County. The large naval air station at Moffett Field became a gateway to military activity in the Pacific, with thousands of personnel brought to the area for training and processing. Soon after the war, the local business community launched an active campaign to attract new nonagricultural-related industries. Cold War industries began to locate near Moffett Field in the Sunnyvale and Mountain View areas. When IBM settled in downtown San Jose in the early 1940s, the invention of the Winchester Disk Drive set the stage for the eventual creation of the place now known as Silicon Valley.

Between 1945 and 1964, orchards were subdivided further into residential tracts, industrial parks, shopping centers, and schools at an average rate of 17,000 acres per year. Within cities and their environs that constitute the urban topology of the county, some of the rural character that was once the "Valley of

Heart's Delight" continues to exist, side by side with the modern constructions that house high-tech factories and think tanks (Cerny 2007: 165–167).

Solano County

Solano County contained five confirmed Mexican land grants. The first of the land grants was Rancho Suisun. Rancho Tolenas, adjacent to Rancho Suisun, included part of Fairfield and extended north into Napa County. The patent was issued in 1840 to Jose Francisco and Antonio Armijo. Juan Felipe Peña and Juan Manuel Vaca were granted Rancho de los Putos in the 1840s. Rancho de los Putos comprised almost 18,000 acres, including Lagoon Valley, Vaca Valley, and Vacaville. Rancho Rio de Los Putos, adjacent to Puta Creek in the northwestern portion of the county, was granted to William Wolfskill in 1842. Also called the Wolfskill Grant, Rancho Rio de los Putos was developed by four Wolfskill brothers, who planted extensive orchards, including a stand of olive trees that still remains today. Rancho Los Ulpinos was granted to John Bidwell in 1844. Bidwell's rancho was adjacent to the Sacramento River. Also in 1844, General Mariano Vallejo established a settlement named Eureka in a portion of his unconfirmed Rancho Suscol; later, this settlement was renamed Vallejo in his honor. Benicia and Cordelia were also within Rancho Suscol. Rancho Sobrante, another unconfirmed rancho, included today's towns of Montezuma, Birds Landing, Collinsville, and Denverton.

In the late 1840s and 1850s, former gold seekers and pioneers began settling in Solano County, where they raised livestock and cultivated fruit orchards, vineyards, wheat, barley, and oats. Produce and livestock were transported overland by wagons to the many sloughs throughout the county and then shipped by water to waiting markets. Twelve townships were established in Solano County between 1850 and 1871. Although the largest towns were adjacent to San Pablo and Suisun Bays, the majority of towns were situated at the ends of sloughs or channels that primarily ran through the eastern portion of the county. In 1868, the completion of the California Pacific Railroad through Solano County allowed the shipment of goods to East Coast markets, significantly bolstering economic development, agricultural production, and population growth. In 1913, the Oakland, Antioch, and Eastern Railway opened its 93-mile route from San Francisco to Sacramento, through largely unpopulated parts of Solano County. In 1928, the Sacramento Northern Railway purchased the railway, but the Depression and the popularity of the automobile contributed to the end of passenger service in 1940; by 1987 the railway had been abandoned (Solano County 2008: 4.10-7).

Sonoma County

European settlement of Sonoma County began on the coast at Fort Ross (1812–1841). With concern over the Russian presence, the Sonoma Mission was founded in 1823. After secularization, General Mariano Guadalupe Vallejo established the Pueblo de Sonoma in 1835, the first town in the county. For his services, Vallejo received a land grant that extended from Petaluma to Solano County.

The San Francisco & North Pacific Railroad, the first Sonoma County railroad began operating in 1870, meeting ferries from San Francisco, just south of Petaluma. In 1875, the North Pacific Coast Railroad linked Sausalito to the coastal communities along Tomales Bay. Further east, the Sonoma Valley Railroad began operation in 1879. These lines merged in 1914 to form the Northwestern Pacific Railroad, which operated from Sausalito to Eureka, until the 1990s.

After statehood, logging along the coastal hills, cattle and dairy ranching, and potato farming supported the county. During the first half of the 20th century, the poultry industry, fruit and fruit processing, and hops production were briefly profitable. Today, wineries have replaced many of the ranches, most of which relocated to California's Central Valley (Cerny 2007: 415–417).

RECORDED REGIONAL RESOURCES

Historical and Archeological Resources

The interpretations and designations of historical and archaeological resources in the Bay Area are documented at the Northwest Information Center (NWIC) at Sonoma State University.

As shown in **Table 3.7-1**, previous records searches in the Bay Area showed that as of 2013, approximately 8,118 precontact and historic period sites were recorded in the Bay Area and are listed with the California Historical Resources Information System, maintained at the NWIC. If one counts all historic period and precontact recorded sites, buildings, and structures, there are over 33,000 such features in the Bay Area.

Of the 8,118 sites previously recorded in the nine-county Bay Area, as of 2013, 1,006 cultural resources were listed in the California Register of Historic Resources (CRHR), meaning that they are significant at the local, State, or national level as specified under a set of established criteria (see details in the "Regulatory Setting" section, below); of those, 744 are also listed in the National Register of Historic Places (NRHP). From this list, 249 resources are listed as California Historic Landmarks. The greatest concentration of resources listed on both the NRHP and the CRHR in the Bay Area occurs in San Francisco, with 181 resources. Alameda County has the second highest number of NRHP- and CRHR-listed resources, with 147.

Table 3.7-1: Recorded Archaeological and Historical Sites in the Bay Area

Source of Record	Alameda County	Contra Costa County	Marin County	Napa County	San Francisco County	San Mateo County	Santa Clara County	Solano County	Sonoma County
Total Recorded Resources (including buildings)[1]	11,242	3,060	2,775	1,517	4,873	2,252	2,599	747	4,304
Individually Listed Resources on both the NRHP and the CRHR[2]	147 BSO	39 BSO	41 BSO	78 BSO	181 BSO	51 BSO	104 BSO	22 BSO	64 BSO
	0 AS	0 AS	5 AS	0 AS	5 AS	1 AS	2 AS	0 AS	4 AS
Individually Listed Resources Only on the CRHR	302 BSO	18 BSO	25 BSO	18 BSO	242 BSO	32 BSO	121 BSO	66 BSO	59 BSO
	12 AS	41 AS	4 AS	11 AS	2 AS	0 AS	31 AS	5 AS	17 AS
California Historical Landmarks[3]	37	15	14	17	48	34	43	14	27
Historic Bridges Listed on the Caltrans Local Bridge Survey[4]	175	187	123	93	78	120	239	115	223

Notes: BSO = Building, Site, or Object; AS = Archaeological Site; CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places; Caltrans = California Department of Transportation.

[1] Number of all recorded sites, including precontact and historic archaeological sites with and without trinomials, as well as recorded historic-period buildings and structures.

[2] Not included here are resources that have been listed as *contributors to* an Archaeological or Historic District, or resources that have been determined to be *eligible* for listing (but not listed) on the NRHP or the CRHR.

[3] State Office of Historic Preservation's California Landmarks By County, July 5, 2016, http://ohp.parks.ca.gov/?page_id=21387. BSO and AS are reported together.

[4] California Department of Transportation Local Bridge Survey, Update 2005, computer database, query only pre-1960 bridges. Please note, a previous "Category 3" used to compile prior RTP EIR listings no longer exists in this survey, with the result that this update may show lower totals compared to previous surveys reported in other EIRs.

Source: MTC and ABAG 2013.

Tribal Cultural Resources and Native American Coordination

Tribal cultural resources are defined in Public Resources Code Section 21074 (see Regulatory Setting under "Tribal Cultural Resources," below) and may include:

- **Resource Collection Location:** This is a location where Native Americans have historically gone, and are known or believed to go today, to collect resources in accordance with traditional cultural rules of practice.
- **Spiritual Location:** This is a location where Native American religious practitioners have historically gone, and are known or believed to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice.
- **Traditional Location:** This is a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world.
- **Cemetery:** A cemetery is a location that has been selected for human burial or interment.

Additionally, different types of archaeological resources may also be tribal cultural resources; they include the following features:

- **Village Site:** Village sites are locations of continuous and concentrated habitation that typically have a large, well-developed midden deposit containing abundant artifactual evidence. They may also contain burials, rock art, bedrock milling stations, or other features.
- **Burial Site:** A burial site or cemetery is a location where intentional human interments are found in large numbers and close concentration. These locations typically lack evidence of other prehistoric activities.
- **Milling Site:** This is a boulder or group of boulders or bedrock outcrops that contain at least one modified surface (mortar, slick, or metate) caused by the processing of food or other natural resources.
- **Lithic Workshop:** A lithic workshop is a distribution of stone flakes and tool fragments reflecting purposeful modification of parent stone through percussion and/or pressure detachment.
- **Shell Middens:** Shell middens are locations with large amounts of marine shell that extend to an appreciable depth below ground surface. They are normally found in coastal contexts but have been found in the interior.
- **Rock Art:** Rock art consists of designs or design elements on rock surfaces created by surface applications (pictographs) or by etching (petroglyphs).
- **Rock Shelters:** These are natural caves or crevices in rock outcrops in which human use has left artifactual remains.

On August 2, 2023 MTC sent project-notification letters to tribes that have been identified by the Native American Heritage Commission (NAHC), to learn about any tribal cultural resources in the plan area. Correspondence in compliance with AB 52 is summarized in **Table 3.7-2,** below.

Table 3.7-2: Summary of AB 52 Consultation

Native American Contact Name	Native American Contact Group	Date of Initial Letter	Date(s) Reply Received
Valentin Lopez, Chairperson	Amah Mutsun Tribal Band	August 4, 2023	No reply received
Irenne Zwierlein, Chairperson	Amah Mutsun Tribal Band of Mission San Juan Bautista	August 4, 2023	No reply received
Ben Ray, Tribal Administrator	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Sarah Ryan, EPA Director	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Philip Gomez, Chairperson	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Michael Gomez, Vice Chair	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Chris McCloud, Treasurer	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Vivian McCloud, Secretary	Big Valley Rancheria/Big Valley Band of Pomo Indians	August 4, 2023	No reply received
Daniel Gomez, Chairperson	Cachil Dehe Band of Wintun Indians of the Colusa Indian Community	August 4, 2023	No reply received
Molly West, Tribal Administrator	Cachil Dehe Band of Wintun Indians of the Colusa Indian Community	August 4, 2023	No reply received
Vickey Macias, Tribal Administrator	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Silver Galleto, Vice Chair	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Christina Hermosillo, Secretary	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Patricia Hermosillo, Chairperson	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Lawrence Stra, Bookkeeper	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Darlene Marsh	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Elaine Willits, Treasurer	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Sandra Roope, Representative	Cloverdale Rancheria of Pomo Indians of California	August 4, 2023	No reply received
Tony Cerda, Chairperson	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
Desiree Munoz, Tribal Liaison	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
Carla Munoz, Tribal Councilwoman	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
Sam Rodriguez	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
Zach Ippoliti	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
Louie Cerda	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received

Native American Contact Name	Native American Contact Group	Date of Initial Letter	Date(s) Reply Received
Brenda Munoz	Coastanoan Rumsen Carmel Tribe	August 4, 2023	No reply received
John Feliz, Chairperson	Coyote Valley Band of Pomo Indians	August 4, 2023	No reply received
Brad McDonald, Tribal Administrator	Coyote Valley Band of Pomo Indians	August 4, 2023	No reply received
Paul Fernandez, Housing Director	Coyote Valley Band of Pomo Indians	August 4, 2023	No reply received
Salvina Norris, Vice Chair	Dry Creek Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Chris Wright, Chairperson	Dry Creek Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Jeremiah Hammerand, Project Manager	Dry Creek Rancheria Band of Pomo Indians	August 4, 2023	No reply received
David Fendrick, CEO, River Rock Casino	Dry Creek Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Greg Sarris, Chairman	Federated Indians of Graton Rancheria	August 4, 2023	Consultation request received September 6, 2023. Tribal representatives did not respond to request to schedule initial consultation meeting. Last communication sent by MTC staff requesting times for a consultation meeting was sent via email on January 2, 2024.
Michael Derry, Planner/Economic Developer	Guidiville Rancheria	August 4, 2023	No reply received
Bunny Tarin, Tribal Administrator	Guidiville Rancheria	August 4, 2023	No reply received
Donald Duncan, Chairperson	Guidiville Rancheria	August 4, 2023	No reply received
Ann Sayers, Chairperson	Indian Canyon Mutsun Band of Costanoan	August 4, 2023	No reply received
Chris Hendricks, Tribal Council Secretary	Ione Band of Miwok Indians	August 4, 2023	No reply received
Sandra Waters, Treasurer	Ione Band of Miwok Indians	August 4, 2023	No reply received
Sara Dutschke, Chairperson	Ione Band of Miwok Indians	August 4, 2023	No reply received
Jereme Dutschke, Cultural Resources Coordinator	Ione Band of Miwok Indians	August 4, 2023	No reply received
Marlon Stevens, Tribal Administrator	Ione Band of Miwok Indians	August 4, 2023	No reply received
Enrique Sanchez, Emergency Services	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Nina Hapner, Dir. of Environmental Services	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Vaughn Pena, Tribal Administrator	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received

Native American Contact Name	Native American Contact Group	Date of Initial Letter	Date(s) Reply Received
Reno Franklin, Chairperson	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Dino Franklin, Jr., Tribal Secretary	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Glenda Jacob-McGill, Member-At-Large	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Elayne May-Muro, Tribal Vice Chairperson	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Marlene Adam, Member-At-Large	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Tara Antone, Member-At-Large	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Anthony Macias	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Savannah Gomes, Treasurer	Kashia Band of Pomo Indians of the Stewarts Point Rancheria	August 4, 2023	No reply received
Charlie Wright, Chairperson	Kletsel Dehe Wintun Nation	August 4, 2023	No reply received
Connie Gomez, Acting Tribal Administrator/ Senior Accountant	Kletsel Dehe Wintun Nation	August 4, 2023	No reply received
Dino Beltran, Vice-Chair	Koi Nation of Northern California	August 4, 2023	No reply received
Darin Beltran, Chairman	Koi Nation of Northern California	August 4, 2023	No reply received
Judy Fast Horse, Secretary	Koi Nation of Northern California	August 4, 2023	No reply received
Lisa Miller, Tribal Administrator	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Marjorie Mejia, Chairperson	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Dianne Seidner, Environmental Planner	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Cathy Lopez, Vice Chairperson	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Danny Ocampo, Secretary	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Burt Steele, Treasurer	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Carol Steele, Tribal Official	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Daniel Steele Jr., Tribal Official	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Mary Figueroa, Tribal Official	Lytton Rancheria Band of Pomo Indians	August 4, 2023	No reply received
Jose Simon III, Chairperson	Middletown Rancheria of Pomo Indians	August 4, 2023	No reply received
Kim Cole, Tribal Administrator	Middletown Rancheria of Pomo Indians	August 4, 2023	No reply received

Native American Contact Name	Native American Contact Group	Date of Initial Letter	Date(s) Reply Received
Dylan Finley, Housing Director	Middletown Rancheria of Pomo Indians	August 4, 2023	No reply received
Scott Gabaldon, Chairperson	Mishewal-Wappo Tribe of Alexander Valley	August 4, 2023	No reply received
Charlene Nijmeh, Chairperson	Muwekma Ohlone Indian Tribe of the SF Bay Area	August 4, 2023	No reply received
Monica Arellano, Vice Chairwoman	Muwekma Ohlone Indian Tribe of the SF Bay Area	August 4, 2023	No reply received
Katherine Perez, Chairperson	North Valley Yokuts Tribe	August 4, 2023	No reply received
Leona Williams, Chairperson	Pinoleville Pomo Nation	August 4, 2023	No reply received
Salvador Rosales, Chairperson	Potter Valley Tribe	August 4, 2023	No reply received
Rosemary Rahmaoui, Tribal Administrative Secretary	Potter Valley Tribe	August 4, 2023	No reply received
Linda Rosas, Transportation Planner	Redwood Valley Rancheria	August 4, 2023	No reply received
Debra Ramirez, Tribal Chairperson	Redwood Valley Rancheria	August 4, 2023	No reply received
Mary Camp, Tribal Administrator	Redwood Valley Rancheria	August 4, 2023	No reply received
Beniakem Cromwell, Chairperson	Robinson Rancheria of Pomo Indians	August 4, 2023	No reply received
Anthony Duncan, Tribal Transportation Planner	Robinson Rancheria of Pomo Indians	August 4, 2023	No reply received
Esther Stauffer, Tribal Administrator	Robinson Rancheria of Pomo Indians	August 4, 2023	No reply received
Shannon Ford, Housing Director	Scotts Valley Band of Pomo Indians	August 4, 2023	No reply received
Nina Campbell, Administrative Assistant	Scotts Valley Band of Pomo Indians	August 4, 2023	No reply received
Sharon James-Tiger, Executive Director	Scotts Valley Band of Pomo Indians	August 4, 2023	No reply received
Kurt O'Regan, Transportation Specialist	Scotts Valley Band of Pomo Indians	August 4, 2023	No reply received
Patricia Ray-Franklin, Tribal Project Coordinator & Cultural Wellness Adv.	Scotts Valley Band of Pomo Indians	August 4, 2023	No reply received
Corrina Gould, Chairperson	The Confederated Villages of Lisjan	August 4, 2023	No reply received
Andrew Galvan	The Ohlone Indian Tribe	August 4, 2023	No reply received
Michael Mirelez, Cultural Resource Coordinator	Torres Martinez Desert Cahuilla Indians	August 4, 2023	No reply received
Gene Whitehouse, Chairperson	United Auburn Indian Community of the Auburn Rancheria	August 4, 2023	No reply received
Brian Guth, Tribal Administrator	United Auburn Indian Community of the Auburn Rancheria	August 4, 2023	No reply received
Steve Hutchason, Tribal Historic Preservation Officer	Wilton Rancheria	August 4, 2023	No reply received

Native American Contact Name	Native American Contact Group	Date of Initial Letter	Date(s) Reply Received
Herbert Griffin, Cultural Preservation Department	Wilton Rancheria	August 4, 2023	No reply received
Jesus Tarango, Chairperson	Wilton Rancheria	August 4, 2023	No reply received
Dahlton Brown, Director of Administration	Wilton Rancheria	August 4, 2023	No reply received
Laverne Bill, Cultural Resources Director	Yocha Dehe Wintun Nation	August 4, 2023	No reply received
Anthony Roberts, Chairperson	Yocha Dehe Wintun Nation	August 4, 2023	No reply received
James Kinter, Tribal Secretary/Tribal Historic Preservation Officer	Yocha Dehe Wintun Nation	August 4, 2023	No reply received
Shelley Ferguson, Director of Administration	Yocha Dehe Wintun Nation	August 4, 2023	No reply received

In addition to AB 52 consultation, MTC sent a copy of the Notice of Preparation to the following tribes and agencies on January 22, 2025. In support of AB 52 consultation, Native American Tribes were offered additional time to provide comments in response to the NOP until March 17, 2025.

- Amah Mutsun Tribal Band
- Amah Mutsun Tribal Band of Mission San Juan Bautista
- Big Valley Rancheria/Big Valley Band of Pomo Indians
- Cachil Dehe Band of Wintun Indians of the Colusa Indian Community
- Cloverdale Rancheria of Pomo Indians of California
- Coastanoan Rumsen Carmel Tribe
- Coyote Valley Band of Pomo Indians
- Dry Creek Rancheria Band of Pomo Indians
- Federated Indians of Graton Rancheria
- Guidiville Rancheria
- Indian Canyon Mutsun Band of Costanoan
- Ione Band of Miwok Indians
- Kashia Band of Pomo Indians of the Stewarts Point Rancheria
- Kletsel Dehe Band of Wintun Indians
- Koi Nation of Northern California
- Lytton Rancheria Band of Pomo Indians
- Middletown Rancheria of Pomo Indians
- Mishewal-Wappo Tribe of Alexander Valley
- Muwekma Ohlone Indian Tribe of the SF Bay Area
- Native American Heritage Commission
- North Valley Yokuts Tribe
- Pinoleville Pomo Nation
- Potter Valley Tribe
- Redwood Valley Rancheria
- River Rock Casino
- Robinson Rancheria of Pomo Indians
- Scotts Valley Band of Pomo Indians
- The Confederated Villages of Lisjan
- The Ohlone Indian Tribe
- Torres Martinez Desert Cahuilla Indians
- United Auburn Indian Community of the Auburn Rancheria
- Wilton Rancheria
- Yocha Dehe Wintun Nation

Locations of Sensitivity

Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near sources of water, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats.

Native American archaeological sites have also been identified in the inland valleys of all Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials.

Dense concentrations of historical resources are often found in large urban areas and smaller cities that experienced growth and development during the historic period. Historic resources are also found in rural settings where homesteads, ranches, or farms were once present. Historic period archaeological remains may include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits often in old wells and privies.

3.7.2 Regulatory Setting

FEDERAL REGULATIONS

National Historic Preservation Act

Among those statutes enacted by Congress that affect historic properties, the National Historic Preservation Act of 1966 (NHPA) is the most significant law that addresses historic preservation. One of the most important provisions of the NHPA is the establishment of the NRHP, the official designation of historical resources. Districts, sites, buildings, structures, and objects are eligible for listing in the NRHP. Nominations are listed if they are significant in American history, architecture, archaeology, engineering, and culture. The NRHP is administered by the National Park Service. To be eligible, a property must be significant under Criteria A through D (described below); and ordinarily be 50 years of age or more:

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or

B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Listing in the NRHP does not entail specific protection or assistance for a property, but it does guarantee recognition in planning for federal or federally assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in the NRHP must be evaluated under CEQA.

Once a resource has been recorded and if it is determined to be significant, the potential impacts (or effects) of a project on a heritage property are assessed. Federal regulatory impact thresholds are contained in Section 106 of the NHPA and accompanying regulations (36 CFR Part 800). Section 106 requires that federal agencies consider the effects of their actions on significant archaeological properties before implementing a project or "undertaking." The criteria of effect are found in 36 CFR 800.0(a) and state that:

> [a]n undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register.

The Advisory Council on Historic Preservation's regulations require that the federal agency apply the criteria of adverse effect on historic properties that would be affected by a proposed undertaking (36 CFR 800.9b). An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, or the quality of data suitable for scientific analysis. These seven aspects of integrity are described as follows:

- **Location**: "Integrity of location" refers to whether a property remains where it was originally constructed or was relocated.
- **Design**: "Integrity of design" refers to whether a property has maintained its original configuration of elements and style that characterize its plan, massing, and structure. Changes made after original construction can acquire significance in their own right.
- **Setting**: "Integrity of setting" refers to the physical environment surrounding a property that informs the characterization of the place.
- **Materials**: "Integrity of materials" refers to the physical components of a property, their arrangement or pattern, and their authentic expression of a particular time period.
- **Workmanship**: "Integrity of workmanship" refers to whether the physical elements of a structure express the original craftsmanship, technology, and aesthetic principles of a particular people, place, or culture at a particular time period.
- **Feeling**: "Integrity of feeling" refers to the property's ability to convey the historical sense of a particular time period.
- **Association**: "Integrity of association" refers to the property's significance defined by a connection to a particular important event, person, or design.

Secretary of the Interior's Standards for the Treatment of Historic Properties

The Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 2017) are intended to promote responsible preservation practices for treatment of historic properties (buildings, structures, objects, districts, and landscapes). The advisory, not regulatory, standards do not, in and of themselves, prescribe decisions about which features of a historic property should be saved and which can be changed. But once a treatment is selected, the standards provide philosophical consistency and guidance to the work. The four treatment approaches, in order of priority, are as follows:

- Preservation, which places a high premium on the retention of all historic fabric through conservation, maintenance, and repair. It reflects a property's continuum over time, through successive occupancies, and the respectful changes and alterations that are made.
- Rehabilitation, which emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it is assumed the property is more deteriorated before work. (Both preservation and rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.)
- Restoration, which focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods.
- Reconstruction, which establishes limited opportunities to recreate a nonsurviving site, landscape, building, structure, or object in all new materials.

The standards are an important reference under CEQA because CEQA Guidelines Sections 15064.5(b)(3) and 15126.4(b) specify that a project that may cause a substantial adverse change in the significance of a historical built environment resource that generally follows the Secretary of the Interior's Standards shall be considered as mitigated to a level of less than significant on the historical resource.

US Department of Transportation Act of 1966

Section 4(f) of the US Department of Transportation Act, as amended and recodified in 1983 (49 US Code Section 303), is triggered by projects funded or approved by a US Department of Transportation agency, including the Federal Highway Administration, Federal Transit Administration, Federal Railroad Administration, and Federal Aviation Administration. Section 4(f) requires a comprehensive evaluation of all environmental impacts resulting from projects that involve the use, or interference with use, of the following types of land:

- publicly owned park lands that are open to the public;
- publicly owned recreation areas that are open to the public;
- publicly owned wildlife and waterfowl refuges that are open to the public; and
- publicly or privately owned historic sites of federal, State, or local significance that are eligible for listing in or are listed in the NRHP.

This evaluation, called the Section 4(f) statement, must be sufficiently detailed to permit the US Secretary of Transportation to determine whether:

- there is no feasible and prudent alternative to the use of such land; or
- the program includes all possible planning to minimize harm to any park, recreation area, wildlife and waterfowl refuge, or historic site that would result from the use of such lands.

If a feasible and prudent alternative is available, a proposed project using Section 4(f) lands cannot be approved by the Secretary. If no feasible and prudent alternative is available, the proposed project must include all possible planning to minimize harm to the affected lands.

Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.

In August 2005, Section 4(f) was amended under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users to simplify the process and approval of projects that have only de minimis impacts on lands protected by Section 4(f). Under these provisions, the US Secretary of Transportation may find such a de minimis impact if consultation with the State Historic Preservation Officer (SHPO) under Section 106 of the NHPA results in a determination that a transportation project would have no adverse effect on the historic site or that there would be no historic sites (i.e., historic properties) affected by the proposed action. In this instance, analysis of avoidance alternatives of Section 4(f) protected properties is not required and the Section 4(f) evaluation process is complete.

American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act of 1978 (AIRFA) (42 US Code Section 1996) pledges to protect and preserve the traditional religious rights of American Indians, Aleuts, Eskimos, and Native Hawaiians. It establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites), and the use of sacred objects shall be protected and preserved. If a place of religious importance to American Indians could be affected by a federal undertaking, AIRFA promotes consultation with Indian religious practitioners, which could be coordinated with Section 106 consultation. Amendments to Section 106 of the NHPA in 1992 strengthened the interface between AIRFA

and the NHPA by clarifying the following: (1) properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization could be determined to be eligible for inclusion in the NRHP; and (2) in carrying out its responsibilities under Section 106, a federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described under (1).

Archeological Resources Protection Act of 1979

The Archeological Resources Protection Act of 1979 (ARPA) (43 CFR Section 7) establishes uniform definitions, standards, and procedures to be followed by all federal land managers in providing protection for archaeological resources located on public lands and Native American lands. Under ARPA, additional requirements could apply to agency action if federal or Indian lands are involved. ARPA (1) prohibits unauthorized excavation on federal and Indian lands, (2) establishes standards for permissible excavation, (3) prescribes civil and criminal penalties, (4) requires agencies to identify archeological sites, and (5) encourages cooperation between federal agencies and private individuals.

Native American Graves Protection and Repatriation Act of 1990

The intent of the Native American Graves Protection and Repatriation Act of 1990 (25 US Code Section 3001) is to identify Native American affiliation or lineal descent and ensure the rightful disposition, or repatriation, of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony that are in federal possession or control. The regulations implementing the requirements of Native American Graves Protection and Repatriation Act relating to the inadvertent discovery of human remains and objects of cultural patrimony of Native American origin on federal or tribal lands are described in 43 CFR Section 10.4.

STATE REGULATIONS

California Register of Historic Resources

Historic properties listed, or formally designated for eligibility to be listed, on the NRHP are automatically listed on the CRHR (PRC Section 5024.1). State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historic resource surveys.

For a historic resource to be eligible for listing on the CRHR, it must be significant at the local, State, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. It is associated with the lives of persons important to local, California, or national history.

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

California Environmental Quality Act

CEQA requires public agencies to consider the effects of their actions on “historical resources,” “unique archaeological resources,” and “tribal cultural resources.” Pursuant to PRC Section 21084.1, a “project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.” Section 21083.2 requires agencies to determine

whether proposed projects would have effects on unique archaeological resources. PRC Section 21084.2 establishes that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment."

Archaeological Resources

CEQA also requires lead agencies to consider whether projects would affect unique archaeological resources. PRC Section 21083.2(g) states that "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. contains information needed to answer important scientific research questions. and there is a demonstrable public interest in that information;

2. has a special and particular quality, such as being the oldest of its type or the best available example of its type; and

3. is directly associated with a scientifically recognized important prehistoric or historic event or person.

Historical Resources

CEQA establishes that an adverse effect on a historical resource qualifies as a significant effect on the environment. "Historical resource" is a term with a defined statutory meaning (PRC Section 21084.1; State CEQA Guidelines Sections 15064.5[a] and [b]). Under State CEQA Guidelines Section 15064.5(a), historical resources include the following:

1. A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in, the CRHR (PRC Section 5024.1) will be presumed to be historically significant.

2. A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically significant.

3. Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the CRHR (PRC Section 5024.1), including the following:

    a) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

    b) is associated with the lives of persons important in our past;

    c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

    d) has yielded, or may be likely to yield, information important in prehistory or history.

4. The fact that a resource is not listed in or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to Section 5020.1[k] of the PRC), or not identified

in a historical resources survey (meeting the criteria in Section 5024.1[g] of the PRC) does not preclude a lead agency from determining that the resource may be a historical resource as defined in PRC Section 5020.1(j) or Section 5024.1.

Tribal Cultural Resources

CEQA also requires lead agencies to consider whether projects will affect tribal cultural resources. PRC Section 21074 states:

a) "Tribal cultural resources" are either of the following:

1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Mitigation of Cultural Resources Impacts

CEQA Guidelines Section 15126.4 states that "public agencies should, whenever feasible, seek to avoid damaging effects on any historical resources of an archaeological nature." The guidelines further state that preservation in place is the preferred approach to mitigate archaeological resource impacts. However, according to Section 15126.4, if data recovery through excavation is "the only feasible mitigation," then a "data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resources, shall be prepared and adopted before any excavation being undertaken." Data recovery is *not* required for a resource of an archaeological nature if "the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource." The section further states that its provisions apply to those archaeological resources that also qualify as historic resources.

California Public Resources Code Section 5024 and State-Owned Lands

Historical resources on State-owned lands are subject to the requirements of PRC Section 5024. PRC Section 5024.5(f) requires State agencies to submit to SHPO for comment documentation for any project having the potential to affect historical resources under its jurisdiction listed in or potentially eligible for inclusion in the NRHP or registered or eligible for registration as California Historical Landmarks. The SHPO has 30 days after receipt of the notice for review and comment. If the SHPO determines that a proposed action would have an adverse effect on a listed historical resource, the relevant State agency shall adopt prudent and feasible measures that will eliminate or mitigate the adverse effects.

Native American Heritage Act

The Native American Heritage Act of 1976 established the NAHC and protects Native American religious values on State property (see PRC Section 5097.9).

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act (PRC Section 5097.9) applies to both State and private lands. The act requires, upon discovery of human remains, that construction or excavation activity cease and that the county coroner be notified. If the remains are those of a Native American, the coroner must notify the NAHC, which notifies and has the authority to designate the most likely descendant (MLD) of the deceased. The act stipulates the procedures that the descendants may follow for treating or disposing of the remains and associated grave goods.

Public Notice to California Native American Indian Tribes

Government Code Section 65092 includes California Native American tribes that are on the contact list maintained by the NAHC in the definition of "person" to whom notice of public hearings shall be sent by local governments.

Health and Safety Code Section 7050.5

Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If they are determined to be Native American, the coroner must contact the NAHC.

Public Resources Code Section 5097

PRC Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the NAHC. Section 5097.5 of the PRC states the following:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Native American Graves Protection and Repatriation Act

Health and Safety Code Sections 8010–8011 establishes a State repatriation policy intent that is consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act. The act strives to ensure that all California Indian human remains and that cultural items are treated with dignity and respect. It encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. It also states the intent for the State to provide mechanisms for aiding California Indian tribes, including nonfederally recognized tribes, in filing repatriation claims and getting responses to those claims.

Senate Bill 18

SB 18 (Stats. 2004, ch. 904; Gov. Code, §§ 65352.3-5) requires that, before the adoption or amendment of a city or county's general plan or specific plans, the city or county shall consult with California Native American tribes that are on the contact list maintained by the NAHC. The intent of this law is to preserve or mitigate impacts on places, features, and objects, as defined in PRC Sections 5097.9 and 5097.993, which are located within the city or county's jurisdiction. The law also states that the city or county shall

protect the confidentiality of information concerning the specific identity, location, character, and use of those places, features, and objects identified by Native American consultation. Government Code Sections 65362.3 to 65362.5 apply to all general and specific plans adopted and/or amended after March 1, 2005.

Since the proposed plan is not a general plan or specific plan, SB 18 does not apply. However, SB 18 would apply to updates to future county or city general plans or specific plans that may be adopted by local jurisdictions in the region.

California Health and Safety Code Sections 18950 through 18961

The State Historic Building Code (HSC; Sections 18950–18961) provide alternative building regulations and building standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of buildings or structures designated as historic buildings. Such alternative building standards and building regulations are intended to facilitate the restoration or change of occupancy so as to preserve their original or restored architectural elements and features, to encourage energy conservation and a cost-effective approach to preservation, and to provide for the safety of the building occupants.

Public Resources Code Section 21080.3

AB 52, signed by the California governor in September of 2014, established a new class of resources under CEQA: "tribal cultural resources," defined in PRC Section 21074. Pursuant to PRC Sections 21080.3.1, 21080.3.2, and 21082.3, lead agencies undertaking CEQA review must, upon written request of a California Native American tribe, begin consultation before the release of an EIR, negative declaration, or mitigated negative declaration.

PRC Section 21080.3.2 states:

> Within 14 days of determining that a project application is complete, or to undertake a project, the lead agency must provide formal notification, in writing, to the tribes that have requested notification of proposed projects in the lead agency's jurisdiction. If it wishes to engage in consultation on the project, the tribe must respond to the lead agency within 30 days of receipt of the formal notification. The lead agency must begin the consultation process with the tribes that have requested consultation within 30 days of receiving the request for consultation. Consultation concludes when either: 1) the parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource, or 2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.

If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process, provisions under PRC Section 21084.3 (b) describe mitigation measures that may avoid or minimize the significant adverse impacts. Examples include:

(1) avoiding and preserving the resources in place, including, but not limited to, planning and constructing to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria;

(2) treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

(A) protecting the cultural character and integrity of the resource,

(B) protecting the traditional use of the resource, and

(C) protecting the confidentiality of the resource;

(3) establishing permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places; and

(4) protecting the resource.

REGIONAL AND LOCAL REGULATIONS

Historic Preservation Ordinances

In addition to national and State historic preservation legislation, many Bay Area counties and cities have adopted optional historic preservation general plan elements or enacted local ordinances that recognize and preserve historic sites. At least 20 Bay Area cities participate in the Certified Local Government Program through the State Office of Historic Preservation. The Certified Local Government Program is a partnership among local governments, the State Office of Historic Preservation, and the National Park Service, which is responsible for administering the National Historic Preservation Program. Participating cities include Alameda, Benicia, Berkeley, Campbell, Danville, Los Altos, Los Gatos, Napa, Oakland, Palo Alto, Redwood City, Richmond, San Francisco, San José, Santa Clara, Saratoga, Sausalito, Sonoma, Sunnyvale, and Vallejo.

City and County General Plans

Most Bay Area counties and cities have general plan goals and policies that consider the protection and/or preservation of archaeological and historical resources. These goals and policies can be included in the open space and conservation elements of the general plan, or some general plans include a separate historic preservation element. Often these policies include the requirement that archaeological sites with significant cultural, historical, or sociological merit be preserved to the maximum extent feasible or the requirement that areas found to contain significant historical or precontact archaeological artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation.

3.7.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 of the State CEQA Guidelines (Criterion CUL/TCR-1);
- cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the State CEQA Guidelines (Criterion CUL/TCR-2);
- disturb any human remains, including those interred outside of dedicated cemeteries (Criterion CUL/TCR-3); or
- cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe (Criterion CUL/TCR-4).

METHOD OF ANALYSIS

This program-level analysis identifies the potential impacts of implementation of the proposed plan on archaeological, historical, and other cultural resources, including tribal cultural resources, within the Bay Area. The methodology related to assessment of the forecasted development pattern, sea level rise adaptation projects, and transportation project-related impacts recognizes that important cultural resources may be encountered during ground-disturbing construction work. It also recognizes that projects associated with the operation and routine maintenance of the existing transportation system, such as signalization, equipment replacement, and asphalt overlay, would not directly affect cultural resources, because in most instances there would be no related ground disturbances. Ground disturbance related to routine maintenance is generally limited to the same depth as previous ground disturbance. Because the specific locations of some cultural resources are not mapped, and the exact extent of ground disturbance associated with the forecasted development pattern, sea level rise adaptation projects, and transportation projects under the proposed plan is unknown at this time, it is not possible to assess impacts on specific cultural resources. Accordingly, neither project-specific reviews nor field studies are feasible or necessary for this program EIR. Additionally, records searches and field studies are considered "expired" after five years (PRC Section 5024.1[g][4]), and therefore it is beneficial to conduct them closer to the time of implementation. Therefore, project-specific records searches and field studies will be conducted at the time of site-specific project implementation. The analysis is based on a review of the type and location of forecasted development pattern, sea level rise adaptation projects, and transportation projects listed in the proposed plan, and their potential to disturb both known and unknown cultural resources. The baseline for the following analysis is the date of the EIR Notice of Preparation release in January of 2025.

For the purposes of the impact discussion, "historical resource" is used to describe built-environment historic-period resources. Archaeological resources (both precontact and historic-period) and tribal cultural resources, which may qualify as "historical resources" pursuant to CEQA, are analyzed separately from built-environment historical resources.

IMPACTS AND MITIGATION MEASURES

Impact CUL/TCR-1: Cause a substantial adverse change in the significance of a built environment historical resource as defined in Guidelines Section 15064.5 (PS)

Historical resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529–1822) through the late 1960s are generally considered for protection if they are determined to be historically or architecturally significant. In the proposed plan area, these may include missions, historic ranch lands, and structures from the Gold Rush and the region's early industrial era. More recent architectural sites may also be considered for protection if they could gain historic significance in the future.

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The effects of forecasted development pattern, sea level rise adaptation projects, and transportation projects would be similar. Therefore, the discussion of their impacts is combined below. Historical resources are specific to their local context; therefore, impacts on these resources resulting from the proposed plan would occur at the local level. As shown in **Table 3.7-1**, the nine counties of the plan area have numerous historical resources that have been listed on the NRHP and CRHR, designated as a California Historical Landmark, or listed on the Caltrans Local Bridge Survey.

Construction and Operation

Projects located in areas with known historical resources, located in communities with established historic preservation programs, or involving activities that would introduce new visual elements or disturb

the existing terrain have the potential to result in significant historical resource impacts. These projects could potentially reduce the aesthetic and physical integrity of historic districts, buildings, and structures (e.g., bridges, towers, sculptures). A higher incidence of conflict with historical resources is expected to occur in urban areas with buildings that are more than 45 years old.

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050, the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households, and 1.5 million new housing units. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that results in focused housing and job growth concentrated primarily in or adjacent to developed areas and along existing transit corridors. Projects located in developed areas would be less likely to introduce new visual elements that could alter the visual character associated with historic districts or buildings. Projects located in or traversing rural lands could also have significant impacts related to sites that are singular examples of a historical setting or structures whose historic value and significance have not been previously evaluated and recognized.

Construction could directly impact historical resources, and ongoing operation could have indirect impacts on historical resources. Identification of the degree and extent of impact requires project-specific analysis that includes a determination of the importance (i.e., the eligibility for local, State, or national register listing) of any historical resource recognized within a proposed alignment or project area. Given the magnitude and location of the forecasted development pattern and transportation projects involving construction activities in the proposed plan, it is possible that significant impacts on historical resources could occur. Examples of potential effects resulting from implementation of the forecasted development pattern or transportation projects include:

- damage to or destruction of a structure or property that is a designated historical resource, that is eligible for listing as a historical resource, or that has not yet been evaluated;
- infill development that is visually incompatible with a designated historic district; and
- roadway improvements that substantially alter the visual character of a designated historic structure or district.

Conclusion

Because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to significantly affect historical resources on a regional and localized level, these impacts would be **potentially significant (PS)**. Mitigation Measure CUL/TCR-1 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure CUL/TCR-1 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- Require a survey and evaluation of buildings and structures greater than 50 years in age within the area of potential effect to determine their eligibility for recognition under federal, State, and/or local historic preservation criteria. The evaluation shall be prepared by an architectural historian or historical architect meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation-Professional Qualification Standards (SOI PQS). The evaluation shall comply with CEQA Guidelines Section 15064.5(b) and, if federal funding or permits are required, with Section 106 of the National Historic Preservation Act of 1966 (16 US Code Section 470 et seq.). Study recommendations shall be implemented.

- Realign or redesign projects to avoid impacts on known historical resources where possible.
- If avoidance of impacts to a significant historical resource is not feasible, implement additional mitigation options that include specific design plans for historic districts or plans for alteration or adaptive reuse of a historical resource that follows the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*. The application of the standards shall be overseen by an architectural historian or historic architect meeting the SOI PQS. Prior to any construction activities that may affect the historical resource, a report meeting industry standards shall identify and specify the treatment of character-defining features and construction activities and be provided to the lead agency for review and approval.
- If a project would result in the demolition or significant alteration of a historical resource, the resource shall be recorded prior to demolition or alteration. Recordation shall take the form of Historic American Buildings Survey (HABS), Historic American Engineering Record (HAER), or Historic American Landscape Survey (HALS) documentation and shall be performed by an architectural historian or historian who meets the SOI PQS. The documentation package shall be archived in appropriate public and secure repositories. The specific scope and details of documentation shall be developed at the project level in coordination with the lead agency.
- Comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect historical resources.

Significance after Mitigation

Implementation of Mitigation Measure CUL/TCR-1 would reduce impacts associated with historical resources because it would require the performance of professionally accepted and legally compliant procedures for the avoidance of known historical resources and the evaluation of previously undocumented historical resources. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact may be reduced to less than significant with mitigation (LTS-M) by avoidance or project redesign, by minimizing physical alterations, or by designing building use while retaining a property's historic character. However, CEQA Guidelines [CCR 15126.4(b)(2)] note that in some circumstances, documentation of a historical resource will not mitigate the effects of demolition of that resource to a less-than-significant level because the historic resources would no longer exist. The entire removal of a historically significant building or structure and/or the loss of character-defining features, however, would result in a significant and unavoidable (SU) impact. Therefore, this impact would be significant and unavoidable (SU).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact CUL/TCR-2: Cause a substantial adverse change in the significance of a unique archaeological resource or a historical resource of an archaeological nature as defined in Guidelines Section 15064.5 (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction

Archaeological materials are by nature specific to their local context; therefore, impacts on these resources resulting from the proposed plan would occur at the local level. Implementation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in archaeological impacts if construction activities include the disturbance of previously identified or unidentified archaeological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood of encountering significant archaeological resources. Likewise, the establishment of staging areas, temporary roads, and other temporary facilities necessary for construction activities has the potential to affect these cultural resources.

As shown in **Table 3.7-1**, the nine counties of the plan area have only a few archaeological sites that have been listed on either the NRHP or the CRHR. Marin and San Francisco Counties have five sites that are listed on both the NRHP and the CRHR, Sonoma County has four, Santa Clara has two, and San Mateo has one. Archaeological sites listed on only the CRHR are more numerous; Contra Costa County has 41, Santa Clara County has 31, Sonoma County has 17, Alameda County has 12, Napa County has 11, Solano County has five, Marin County has four, and San Francisco County has two.

Both rural land conversion and urban infill have the potential to disturb archaeological resources, although rural areas are more likely to contain intact archaeological resources that are situated in their historic context because these areas are less likely to have been subject to previous ground disturbance. Implementation of the proposed plans land use growth footprint would develop approximately 8,100 acres of land not currently designated as urban built-up by FMMP over the course of the planning period. **Table 3.7-3** indicates that this would primarily occur in Contra Costa, Solano, and Alameda Counties.

Table 3.7-3: Future Acreages in "Urban" Land by County

County	Total Land (acres)	2022 Urban Built-Up (acres)	2022 Urban Built-Up (%)	Forecasted Development on Land not Designated as Urban Built-Up (acres)	Proposed Plan 2050 Potential Urban Built-Up (acres)	Proposed Plan 2050 Potential Urban Built-Up (%)
Alameda	472,000	148,200	31%	770	149,000	32%
Contra Costa	458,800	149,100	32%	4,100	153,200	33%
Marin	332,900	41,200	12%	130	41,400	12%
Napa	481,300	24,400	5%	430	24,800	5%
San Francisco	29,900	29,900	100%	0	29,900	100%
San Mateo	287,100	74,200	26%	40	74,300	26%
Santa Clara	826,300	190,400	23%	580	191,000	23%
Solano	525,900	58,100	11%	1,600	59,700	11%
Sonoma	1,008,200	76,500	8%	430	77,000	8%
Total	4,422,400	792,100	18%	8,100	800,100	18%

Note: Numbers less than 1 are shown as "<1; whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.

Source: Data compiled by MTC and ABAG in 2025 based on 2022 data from California Department of Conservation.

Portions of the forecasted development pattern located in areas of sensitivity, such as the historic margins of San Francisco and San Pablo Bays, ridgetops, midslope terraces, hill bases, alluvial flats, and inland valleys, are more likely to encounter archaeological resources. Sea level rise adaptation projects under the proposed plan include a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Ground-disturbing construction of levees, seawalls, marsh restoration, and tidal gates would occur in the archaeologically sensitive areas of the San Francisco and San Pablo Bays, in areas that are likely to have not been developed. Sea level rise adaptation projects such as elevated roadways, although also located in these same sensitive areas, would likely be located in previously disturbed areas, because they would follow existing roadways.

Transportation corridors typically follow valleys and drainage areas, which often correspond with historic settlement patterns. Infill development and transportation projects involving improvements within existing urban areas, within existing transportation corridors, or to existing infrastructure or operations are less likely to affect archaeological resources because these projects are generally located in already-disturbed areas that typically have been subject to previous cultural resource surveys; as described previously, historically significant data are unlikely to be gained from archaeological materials located in areas that have been disturbed. Therefore, encountering intact, previously unknown archaeological resources, still associated with an archaeological site in its historic context, during ground-disturbing activities is less likely. Some transportation projects, particularly new rail projects, could be located in areas that have not been subject to previous ground disturbance. The degree and extent of impacts would depend upon project location and construction methods. Project-specific analysis would be required to determine the precise area of impact and the value (i.e., the eligibility for local, State, or national register listing) of any archaeological resource identified within a proposed alignment or project area. Furthermore, all projects undertaken or overseen by Caltrans must abide by extensive procedures and policies, outlined in the *Standard Environmental Reference, Vol 2:Cultural Resources*, which dictates the nature and extent of cultural resource protections consistent with State and federal law. Because ground disturbance has the potential to disturb unique archeological resources, this impact is potentially significant (PS).

Operation

Implementation of the proposed plan would result in the placement and operation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects. Once developed, no additional earthmoving activities related to sea level rise adaptation projects would occur that could disturb archaeological resources. This impact would be less than significant (LTS).

Conclusion

Because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to adversely affect archaeological resources, these impacts would be **potentially significant (PS)**. Mitigation Measure CUL/TCR-2 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure CUL/TCR-2 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below:

- Before construction activities, project sponsors shall retain a qualified archaeologist to conduct a record search at the appropriate information center to determine whether the project area has been previously surveyed and whether resources were identified; the record search shall include contacting the NAHC to request a Sacred Lands File search and a list of relevant Native American contacts who may have additional information. If a survey of the project area has not been conducted in the last 5

years, project sponsors shall retain a qualified archaeologist to conduct archaeological surveys prior to construction activities. Project sponsors shall follow recommendations identified in the survey, which may include activities such as subsurface testing, designing and implementing a Worker Environmental Awareness Program, construction monitoring by a qualified archaeologist, avoidance of sites, or preservation in place.

- Areas determined to be of cultural significance shall be monitored during the grading, excavation, trenching, and removal of existing features by a qualified archeologist and culturally affiliated California Native American tribal monitor.
- To ensure that new transportation facilities do not adversely affect potentially buried archaeological deposits, an underwater archaeological survey shall be conducted to identify, evaluate, and protect significant submerged cultural resources prior to activities that would disturb the shoreline or the floor of the bay. Additionally, the archaeologist shall request a search of California State Lands Commission's Shipwreck Database.
- When a project would impact a known archaeological site, the project sponsor and/or implementing agency shall determine whether the site is a historical resource (CEQA Guidelines Section 15064.5[c][1]). If archaeological resources identified in the project area are considered potentially significant, the project sponsor and/or responsible implementing agency shall undertake additional studies overseen by a qualified archaeologist (36 CFR Section 61) to evaluate the resources eligibility for listing in the CRHR, NRHP, and/or local register and to recommend further mitigative treatment. Evaluations shall be based on, but not limited to, surface remains, subsurface testing, or archival and ethnographic resources, on the framework of the historic context and important research questions of the project area, and on the integrity of the resource. If a site to be tested is precontact, culturally affiliated California Native American tribal representatives shall be afforded the opportunity to monitor the ground-disturbing activities. Appropriate mitigation may include curation of artifacts removed during subsurface testing.
- If precontact archeological resources are identified through survey or discovered in the project area, the culturally affiliated California Native American tribe shall be notified. Both the archeologist and tribal monitor or tribal representative should strive for agreement on the determined significance of an artifact or cultural resource.
- If significant archaeological resources that meet the definition of historical or unique archaeological resources are identified in the project area, the preferred mitigation of impacts is preservation in place (CEQA Guidelines Section 15126.4[b]; PRC Section 21083.2). Preservation in place may be accomplished by, but is not limited to, avoidance by project design, incorporation within parks, open space or conservation easements, covering with a layer of sterile soil, or similar measures. If preservation in place is feasible, mitigation is complete. Additionally, where the implementing agency determines that an alternative mitigation method is superior to in-place preservation, the project sponsor and/or implementing agency may implement such alternative measures.
- When preservation in place or avoidance of historical or unique archaeological resources are infeasible, data recovery through excavation shall be required (CEQA Guidelines Section 15126.4[b]). Data recovery would consist of approval of a Data Recovery Plan and archaeological excavation of an adequate sample of site contents so that research questions applicable to the site can be addressed. For precontact sites, the culturally affiliated California Native American tribe shall be afforded the opportunity to monitor the ground-disturbing activities. If only part of a site would be impacted by a project, data recovery shall only be necessary for that portion of the site. Data recovery shall not be required if the implementing agency determines prior testing and studies have adequately recovered the scientifically consequential information from the resources. Confidential studies and reports resulting from the data recovery shall be deposited with the Northwest Information Center. Mitigation may include curation for artifacts removed during data recovery excavation.

- If archaeological resources are discovered during construction, all work near the find shall be halted and the project sponsor and/or implementing agency shall follow the steps described under CEQA Guidelines Section 15064.5(f), including an immediate evaluation of the find by a qualified archaeologist (36 CFR Section 61) and implementation of avoidance measures or appropriate mitigation if the find is determined to be a historical resource or unique archaeological resource. If the find is a precontact archaeological site, the culturally affiliated California Native American tribe shall be notified and afforded the opportunity to monitor mitigative treatment. During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project area.
- Integrate curation of all historical resources or an archaeological nature or unique archaeological resources and associated records in a regional center focused on the care, management, and use of archaeological collections. All Native American human remains and associated grave goods discovered shall be returned to their Most Likely Descendent and repatriated. The final disposition of artifacts not directly associated with Native American graves will be negotiated during consultation with the culturally affiliated California Native American tribes. Artifacts include material recovered from all phases of work, including the initial survey, testing, indexing, data recovery, and monitoring. Curated materials shall be maintained with respect for cultures and available to future generations for research.
- Project sponsors shall comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect archaeological resources.

Significance after Mitigation

Implementation of Mitigation Measure CUL/TCR-2 would reduce impacts associated with archaeological resources because it would require the performance of professionally accepted and legally compliant procedures for the discovery of previously undocumented significant archaeological resources. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact may be less than significant with mitigation by avoiding or preserving in place unique archaeological resources through project design, and by avoiding or preserving inadvertent discoveries of significant archaeological resources through project redesign. If avoidance or preserving in place is infeasible, direct impacts may be reduced to a less-than-significant level by minimizing disturbance or undertaking additional investigation to determine the significance and integrity of the portion of the archaeological resource within the project area. The destruction or substantial alteration of the contributing physical characteristics or character of the physical setting of a unique archaeological resource or historical resource of an archaeological nature, however, would result in a significant and unavoidable (SU) impact.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact CUL/TCR-3: Disturb any human remains, including those interred outside of dedicated cemeteries (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction

Impacts related to disturbance of human remains are construction impacts that occur from ground disturbance. Ground-disturbing effects of forecasted development pattern, sea level rise adaptation projects, and transportation projects would be similar. Therefore, the discussion of their impacts is combined below. Impacts on human remains are by nature specific to their local context, and for this reason, impacts on these resources resulting from the proposed plan would occur at the local level. In general, potential impacts on human remains would be similar to those discussed for archaeological resource impacts discussed under Impact CUL/TCR-2. The plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects involving construction activities that would disturb native terrain, including excavation, grading, or soil removal, would have the greatest likelihood to encounter human remains.

California law recognizes the need to protect Native American human burials, Native American skeletal remains, and items associated with Native American burials from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in California Health and Safety Code Section 7050.5 and PRC Section 5097 et seq.

If human remains are discovered during any construction activities, potentially damaging ground-disturbing activities in the area of the remains shall be halted immediately, and the project applicant shall notify the appropriate county coroner and the NAHC immediately, according to PRC Section 5097.98 and Section 7050.5 of the California Health and Safety Code. If the remains are determined by NAHC to be Native American, the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. Following the coroner's findings, the NAHC-designated MLD and the landowner shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in PRC Section 5097.94.

Compliance with California Health and Safety Code Section 7050.5 and PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains and to appropriately treat any remains that are discovered. This would be less than significant (LTS).

Operation

Proposed plan implementation would include development of the land use growth footprint, sea level rise adaptation projects, and transportation projects, as well as transportation, housing, economic, and environmental strategies. Once developed, no additional earth moving activities that could disturb human remains would occur, and this would be less than significant (LTS).

Conclusion

This impact would be **less than significant (LTS)** because there are existing State regulations and oversight in place that would effectively reduce the potential to disturb human remains to an acceptable level.

Mitigation Measures

None required.

Impact CUL/TCR-4: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Construction

Ground-disturbing effects of implementing the forecasted development pattern, sea level rise adaptation projects, and transportation projects would be similar. Therefore, the discussion of their impacts is combined below. Tribal cultural resources are by nature specific to their local context, and for this reason, impacts on these resources resulting from the proposed plan would occur at the local level. In general, potential impacts on tribal cultural resources would be similar to those discussed for archaeological resources under Impact CUL/TCR-2. Implementation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects involving construction activities that would disturb native terrain, including excavation, grading, or soil removal, would have the greatest likelihood to encounter tribal cultural resources. Because ground disturbance has potential to disturb tribal cultural resources, this impact is potentially significant (PS).

AB 52 requires that lead agencies undertaking CEQA review must, upon written request of a California Native American Tribe, begin consultation once the lead agency determines that the application for the project is complete. As detailed above in Section 3.7.1, "Environmental Setting," MTC sent letters to 101 Native American tribal representatives in compliance with AB 52. Only the Federated Indians of Graton Rancheria (Graton Rancheria) replied to the August 2, 2023, letter. As of the date of publication of this Draft EIR, no tribal cultural resources were identified.

Subsequent discretionary projects may be required to prepare site-specific project-level analysis to fulfill CEQA requirements, which may include additional AB 52 consultation that could lead to the identification of tribal cultural resources.

Operation

The proposed plan would include implementation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects, as well as housing, economic, transportation, and environmental strategies. Typically, once developed, there would be no additional earth moving activities affecting undisturbed ground that could disturb tribal cultural resources; rather, ongoing maintenance or repair activities would be in previously-disturbed areas. This would be less than significant (LTS).

Conclusion

Although no resources within the plan area have been identified as meeting any of the PRC Section 5024.1(c) criteria, it is possible that tribal cultural resources could be identified during analysis of subsequent projects. Therefore, the proposed plan would have a **potentially significant (PS)** impact on tribal cultural resources as defined in PRC Section 21074. Mitigation Measure CUL/TCR-4 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure CUL/TCR-4(a) If the implementing agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process required under PRC Section 21080.3.2, implementing agencies and/or project sponsors shall implement the following measures (or equally effective measures), where feasible and as applicable, to address site-specific impacts and avoid or minimize the significant adverse impacts:

- Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource (PRC Section 21084.3[a]). If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process, provisions in the PRC describe mitigation measures that, if determined by the lead agency to be feasible, may avoid or minimize the significant adverse impacts (PRC Section 21084.3[b]). Examples include:
  - avoiding and preserving the resources in place, including planning and constructing to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space to incorporate the resources with culturally appropriate protection and management criteria;
  - treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including:
    - protecting the cultural character and integrity of the resource,
    - protecting the traditional use of the resource, and
    - protecting the confidentiality of the resource;
  - establishing permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places; and
  - protecting the resource.
- The implementing agency shall determine whether or not implementation of a project would indirectly affect tribal cultural resources by increasing public visibility and ease of access. If it would, the implementing agency shall take measures to reduce the visibility or accessibility of the tribal cultural resource to the public. Visibility of the resource can be reduced through the use of decorative walls or vegetation screening. Accessibility can be reduced by installing fencing or vegetation barriers, particularly noxious vegetation, such as poison oak or blackberry bushes. It is important to avoid creating an attractive nuisance when protecting tribal cultural resources. Conspicuous walls or signs indicating that an area is restricted may result in more attempts to access the excluded area.

Mitigation Measure CUL/TCR-4(b) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable a based on project- and site-specific considerations, that include those identified below:

- Implement Mitigation Measure CUL/TCR-2.

Significance after Mitigation

Implementation of Mitigation Measure CUL/TCR-4 would reduce impacts associated with tribal cultural resources because it would require the performance of professionally accepted and legally compliant procedures for the identification of tribal cultural resources associated with subsequent projects. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact may be less than significant (LTS-M) by avoiding or preserving in place tribal cultural resources through project design. If avoidance or preserving in place is infeasible, disturbance of a tribal cultural resource, however, would result in a significant and unavoidable (SU) impact.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

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3.8 GEOLOGY, SEISMICITY, AND MINERAL RESOURCES

This section evaluates the potential impacts related to geology and seismicity resulting from the implementation of the proposed plan. In addition to regional geologic and seismic hazards, the potential effects related to mineral resources and local hazards, such as risks related to underlying geologic materials and soils, are also evaluated. The effects of erosion on water quality are addressed in Section 3.10, "Hydrology and Water Quality."

Comments received in response to the Notice of Preparation identified challenges associated with growth and development in California, including consideration of earthquakes and land movement. This issue is addressed in Section 3.8.3, "Impact Analysis," below.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor the statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.8.1 Environmental Setting

REGIONAL GEOLOGY

The state of California has eleven natural geologic regions, known as geomorphic provinces, which are defined by the presence of similar physical characteristics, such as relief, landforms, and geology (CGS 2002). The majority of the nine-county San Francisco Bay Area is located within what is known as the Coast Range geomorphic province, with eastern portions of Solano, Contra Costa, and Alameda Counties extending into the neighboring Great Valley geomorphic province located east of the Coast Ranges.

Coast Range Province

The Coast Range is a geologically complex province that extends 400 miles along the Pacific Coast, from Oregon south into southern California. The Coast Range province is characterized by a series of northwest-trending ridges and valleys that run roughly parallel to the San Andreas fault zone and can be further divided into the northern and southern ranges, which are separated by San Francisco Bay. The San Francisco Bay is a broad, shallow regional structural depression created from an east-west expansion between the San Andreas and the Hayward Fault Systems. In the southern Bay Area, the Santa Cruz Mountains border San Francisco Bay on the west, while the Berkeley Hills, an extension of the Diablo Range, are to the east. Mount Diablo marks the northern end of the Diablo Range, which stretches 130 miles southward to the Kettleman Hills at the cusp of the San Joaquin Valley. The broad, low-relief Santa Clara and San Benito Valleys lie between the Santa Cruz Mountains and the Diablo Range. In the North Bay, the rugged, mountainous character of the Marin Peninsula is dominated by Mount Tamalpais (elevation 2,604 feet above sea level).

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks that form the Franciscan Assemblage, located east of the San Andreas Fault. The Franciscan Assemblage in this region of California is approximately 65–150 million years old and consists primarily of greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments. The region west of the San Andreas Fault is underlain by a mass of basement rock known as the

Salinian Block that is composed mainly of marine sandstone (up to 65 million years old) and various metamorphic rocks[1] believed to have originated some 350 miles to the south. The Salinian Block has been moving northward along the west side of the San Andreas Fault, and associated rocks can be found as far north as Point Arena, on the Mendocino County coast.

Marginal lands surrounding San Francisco Bay consist generally of alluvial plains of low relief that slope gently bayward from the bordering uplands and foothills. The alluvial plains that make up the bay margin are composed of alluvial sediments (up to two million years old) consisting of unconsolidated stream and basin deposits. These alluvial plains terminate bayward at the tidal marshlands that immediately surround the bay. Marshlands are composed of intertidal deposits, including widely found, fine-grained plastic clays commonly referred to as bay mud, which, in some areas, underlies artificial fills. Historic shoreline reclamation projects beginning at the turn of the 20th century have resulted in the placement of varying types of artificial fill that overlie intertidal deposits. San Francisco Bay is originally believed to have encompassed 700 square miles, although dredging and fill operations have reduced the extent of the bay to approximately 400 square miles.

Great Valley

Portions of Solano, Contra Costa, and Alameda Counties are in the Great Valley geomorphic province, which is characterized by a large, nearly level inland alluvial plain 400 miles in length and averaging 50 miles in width. The topography of the Great Valley is primarily flat, but it slopes gently along its eastern margin (Sierra Nevada foothills) and western margin (Coast Ranges). Sediments in the Great Valley consist of gravels, sands, clays, and silts that originated largely from the Sierra Nevada, with sediments from the Coast Ranges contributing to a lesser extent. The sediments that compose the valley floor are thick, in some areas extending as far as 10 miles below the surface. The Great Valley Sequence, a thick section of ancient sea floor sediments extending under the Great Valley, overlies the Coast Range Franciscan Assemblage along the valley's western flank.

SOILS

A wide variety of soils and soil types can be found throughout the nine-county Bay Area region. Soils in the Bay Area fall within four major classifications established by the US Natural Resources Conservation Service. Depending on localized conditions, these general classifications are grouped into more specific soil types by location, climate, and slope. The Santa Clara Valley and the alluvial plains surrounding San Francisco Bay are classified as deep alluvial plain and floodplain soils. These soils occupy the valleys in areas with higher rainfall and are considered productive when drained and fertilized. Soils closer to the bay margin are generally dark-colored clays that have a high water table or are subject to flooding. Soils at the extreme edge of San Francisco Bay have a moderate to high content of soluble salts; these soils are referred to as alkali soils. Soils in northern San Mateo County, the eastern portion of San Francisco, and Marin County are classified as residual soils and are characterized by moderate depth to underlying bedrock. However, much of the Bay Area has been developed, and in urbanized areas, native soils are commonly no longer present or have been reworked and combined with imported fill materials over a long history of earthwork activities associated with development.

Seismologists have observed differences in seismic shaking effects that are partially dependent on underlying soil deposits. Soft soils are known to amplify ground shaking and are considered in seismic design requirements. The National Earthquake Hazards Reduction Program (NEHRP) has defined five soil types based on several different criteria (Milsom and Eriksen 2011):

[1] Metamorphic rocks are sedimentary or volcanic rocks altered by prolonged heating and deformation.

- **Soil Type A** includes unweathered intrusive igneous rock. Does not contribute greatly to shaking amplification.
- **Soil Type B** includes volcanics, most Mesozoic bedrock, and some Franciscan bedrock. Does not contribute greatly to shaking amplification.
- **Soil Type C** includes some Quaternary sands, sandstones and mudstones, some Upper Tertiary sandstones, mudstones and limestone, some Lower Tertiary mudstones and sandstones, and Franciscan melange and serpentinite. Can contribute to shaking amplification depending on site-specific characteristics.
- **Soil Type D** includes some Quaternary muds, sands, gravels, and silts. Significant amplification of shaking by these soils is generally expected.
- **Soil Type E** includes water-saturated mud and artificial fill. The strongest amplification of shaking is expected for this soil type.

SEISMICITY

The Bay Area is considered a region of high seismic activity with numerous active and potentially active faults capable of producing significant seismic events. An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years) unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (CGS 2018). The US Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes occurring in the Bay Area and concluded that there is currently a 72% likelihood of a magnitude 6.7 or higher earthquake occurring in the Bay Area over the 30-year period between 2014 and 2043 (USGS 2016). The Hayward, Calaveras, and San Andreas Faults are the three faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These three faults are strike-slip- faults[2] that have experienced movement within the last 155 years.

The San Andreas Fault is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates. Other principal faults capable of producing significant Bay Area ground shaking, listed in **Table 3.8-1** and shown in **Figure 3.8-1**, include the Hayward Fault, the Rodgers Creek–Healdsburg Fault, the Concord–Green Valley Fault, the Marsh Creek-Greenville Fault, and the West Napa Fault. A major seismic event on any of these active faults could cause significant ground shaking and surface fault rupture, as was experienced during earthquakes in recorded history, namely the 1868 Hayward earthquake, the 1906 San Francisco earthquake, and the 1989 Loma Prieta earthquake. The estimated maximum moment magnitudes identified in **Table 3.8-1** represent *characteristic* earthquakes on particular faults.[3] In addition, active blind-thrust and reverse-thrust faults[4] in the region that accommodate compressional movement include the Monte Vista–Shannon and Mount Diablo Faults.

[2] "Strike-slip" faults primarily exhibit displacement in a horizontal direction but may have a vertical component. During right-lateral strike-slip movement of the San Andreas Fault, for example, the western portion of the fault slowly moves north while the relative motion of the eastern portion is to the south.

[3] Moment magnitude is related to the physical size of a fault rupture and movement across a fault, while Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event. The concept of "characteristic" earthquake means that we can anticipate, with reasonable certainty, the actual damaging earthquakes (the size of the earthquakes) that can occur on a fault.

[4] A reverse fault is one with predominantly vertical movement in which the upper block moves upward in relation to the lower block; a thrust fault is a low-angle reverse fault. Blind-thrust faults are low-angled subterranean faults that have no surface expression.

Table 3.8-1: Active Bay Area Faults

Fault	Recency of Movement	Historical Seismicity
Hayward	1868 Holocene	M7.0, 1868;
San Andreas	1989 Holocene	M6.9, 1989; M7.8, 1906; M7.4, 1838; Many < M6
Rodgers Creek- Healdsburg	1969 Holocene	M6.4, 1898; M5.6, M.7 1969
Concord–Green Valley	1955 Holocene	M5.4, 1955
Marsh Creek-Greenville	1980 Holocene	M5.4, 1980
San Gregorio–Hosgri	Holocene; Late Quaternary	Many M5.0 - M6.0
West Napa	2000 Holocene	M6.0, 2014; M5.0, 2000
Maacama	Holocene	Historic active creep
Calaveras	1984 Holocene	M6.2, 1984; Many < M5
Mount Diablo Thrust	Quaternary (possibly active)	N/A

Note: Magnitudes are shown in moment magnitude scale. Only the largest recorded earthquakes are listed.
Source: CGS 2024.

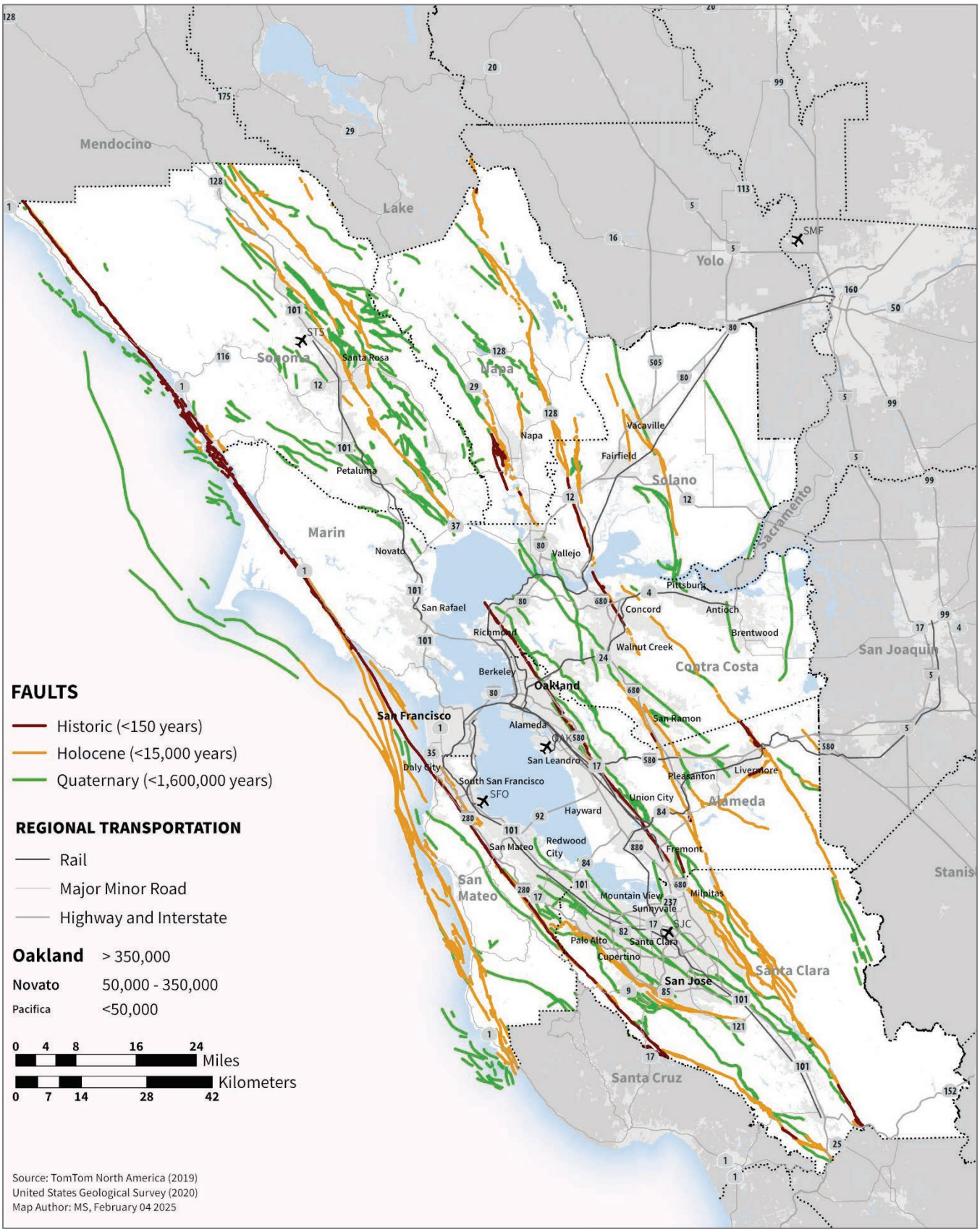
GEOLOGIC AND SEISMIC HAZARDS

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Future faulting is generally expected along different segments of faults with recent activity (CGS 2008). Structures and transportation and utility systems crossing fault traces are at risk during a major earthquake because of ground rupture caused by differential lateral and vertical movement on opposite sides of the active fault trace. Lateral displacement may range from a few inches to over 20 feet, as occurred in the 1906 San Francisco earthquake. Thrust faults, as well as faults with strike-slip movement, can have a vertical displacement component of several feet.

The exception to obvious surface displacement is the "blind-thrust" fault. The Mount Diablo blind thrust fault has been mapped on the western base of Mount Diablo on the east side of the San Ramon Valley. This fault is considered a "blind thrust" because it does not exhibit a surficial expression of displacement. The Mount Diablo thrust fault slips at a long-term rate of about three millimeters per year, but it has not been zoned as an active fault under the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) because of the inability to identify its exact location on the surface (see description of the Alquist-Priolo Act in Section 3.8.2, "Regulatory Setting"). Although surface fault rupture could occur on any of the multiple active and potentially active faults located within the Bay Area, ground rupture is most likely to occur along active faults zoned as Earthquake Fault Zones under mandate of the Alquist-Priolo Act.

Figure 3.8-1: Principal Faults



Sources: TomTom North America 2019; USGS 2020.

Ground Shaking

Strong ground movement from a major earthquake could affect the Bay Area during the next 30 years. Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. The intensity of ground movement during an earthquake can vary depending on the overall magnitude, distance from the fault, direction of earthquake energy, and type of geologic material.

Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments, such as artificial fill. Particularly, unconsolidated sediments in areas located relatively distant from faults can intensify ground shaking. For example, the areas that experienced the worst structural damage further away from the Loma Prieta epicenter were those locations with soils that amplified the effects of ground shaking. The Modified Mercalli Intensity (MMI) scale (see **Table 3.8-2**) is a common measure of earthquake effects attributable to ground shaking intensity. The MMI values range from I (earthquake not felt) to XII (damage nearly total), and intensities as low as V could cause structural damage.[5]

Table 3.8-2: Modified Mercalli Intensity Scale

Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
IV	Felt indoors by many, outdoors by a few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Note: The original MMI scale goes to XII, but those values are no longer reported or described by the US Geological Survey. The description was adapted slightly from the US Geological Survey.
Source: USGS n.d.-a; compiled by MTC and ABAG in 2025.

Areas in the Bay Area most susceptible to intense ground shaking are those areas located closest to the earthquake-generating fault and areas underlain by thick, loosely unconsolidated, saturated sediments, particularly soft, saturated bay muds, and artificial fill along the tidal margins of San Francisco Bay.

[5] The damage level represents the estimated overall level of damage that will occur for various MMI levels. The damage, however, will not be uniform. Some structures will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all structures perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a structure all affect its performance.

Probabilistic ground shaking is mapped in **Figure 3.8-2**. This map shows likely shaking intensity in the Bay Area in any 50-year period from all possible faults.

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or nearly saturated soils lose cohesion and are converted to a fluid state as a result of significant shaking. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluidlike behavior of the soil. Soil liquefaction causes ground failure that can damage roads, airport runways, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at shallow depths, or in saturated unconsolidated or artificial fill sediments located in reclaimed areas along the margin of San Francisco Bay and along Bay Area river systems. Liquefaction potential is highest in areas underlain by shallow groundwater and bay fills, bay mud, and unconsolidated alluvium. **Figure 3.8-3** illustrates liquefaction susceptibility in the Bay Area.

Expansive Soils

Expansive soils possess a "shrink-swell" characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater. Perched groundwater is a local saturated zone above the water table that typically exists above an impervious layer (such as clay) of limited extent. Expansive soils are typically very fine grained and have a high to very high percentage of clay. Structural damage may occur incrementally over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Soils with high clay content, such as the bay muds located on the margins of the San Francisco Bay, are highly expansive.

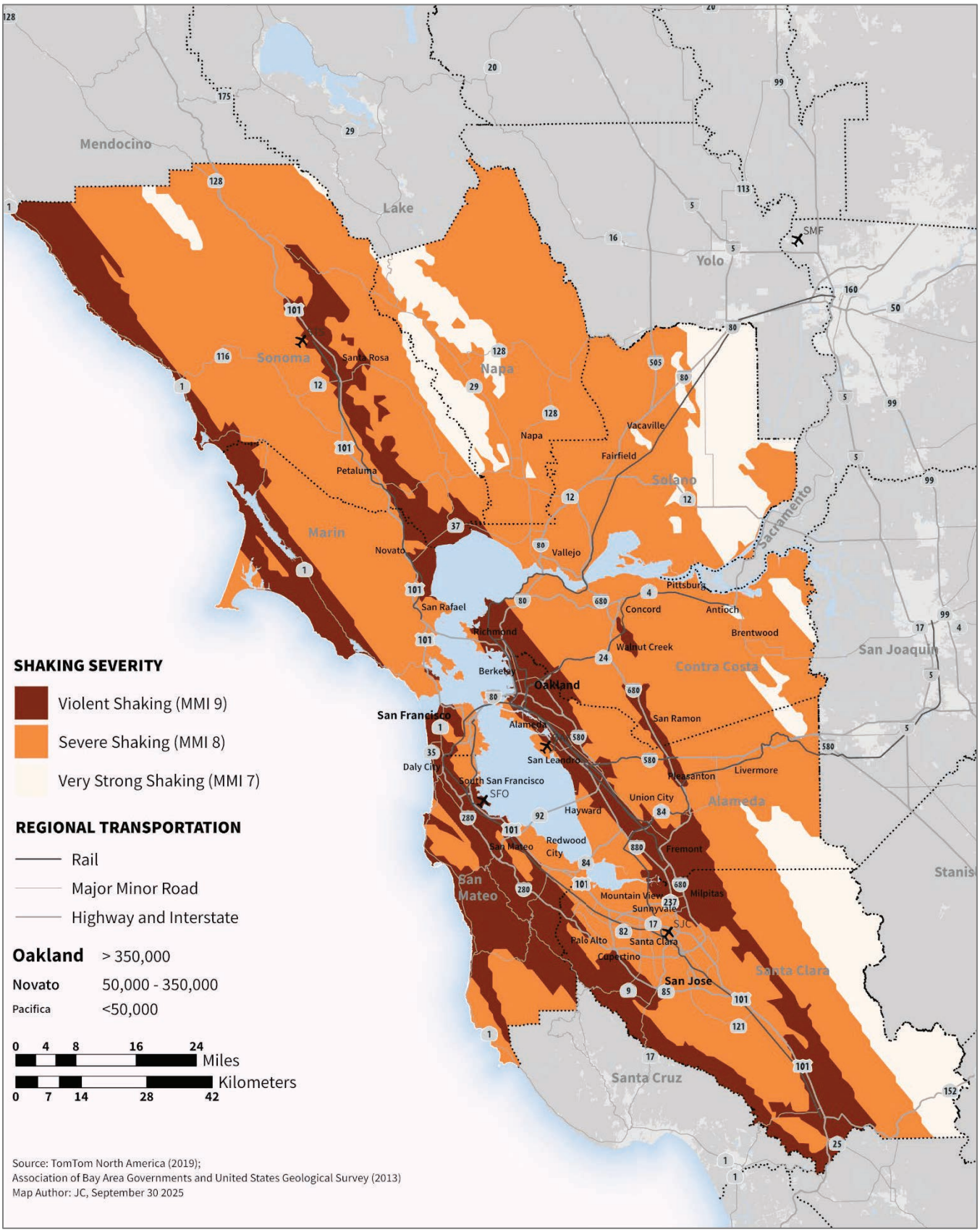
Soil Erosion

Soil erosion is the process whereby soil materials are worn away and transported to another area, either by wind or water. Rates of erosion can vary depending on soil material and structure, building placement, and human activity. The potential for soil erosion is variable throughout the Bay Area. Soil with high amounts of silt can be easily eroded, while sandy soils are less susceptible to erosion. Excessive soil erosion can eventually damage building foundations, roadways, and dam embankments. Erosion is most likely on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can, therefore, be higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and covered with vegetation, concrete, structures, or asphalt.

Settlement

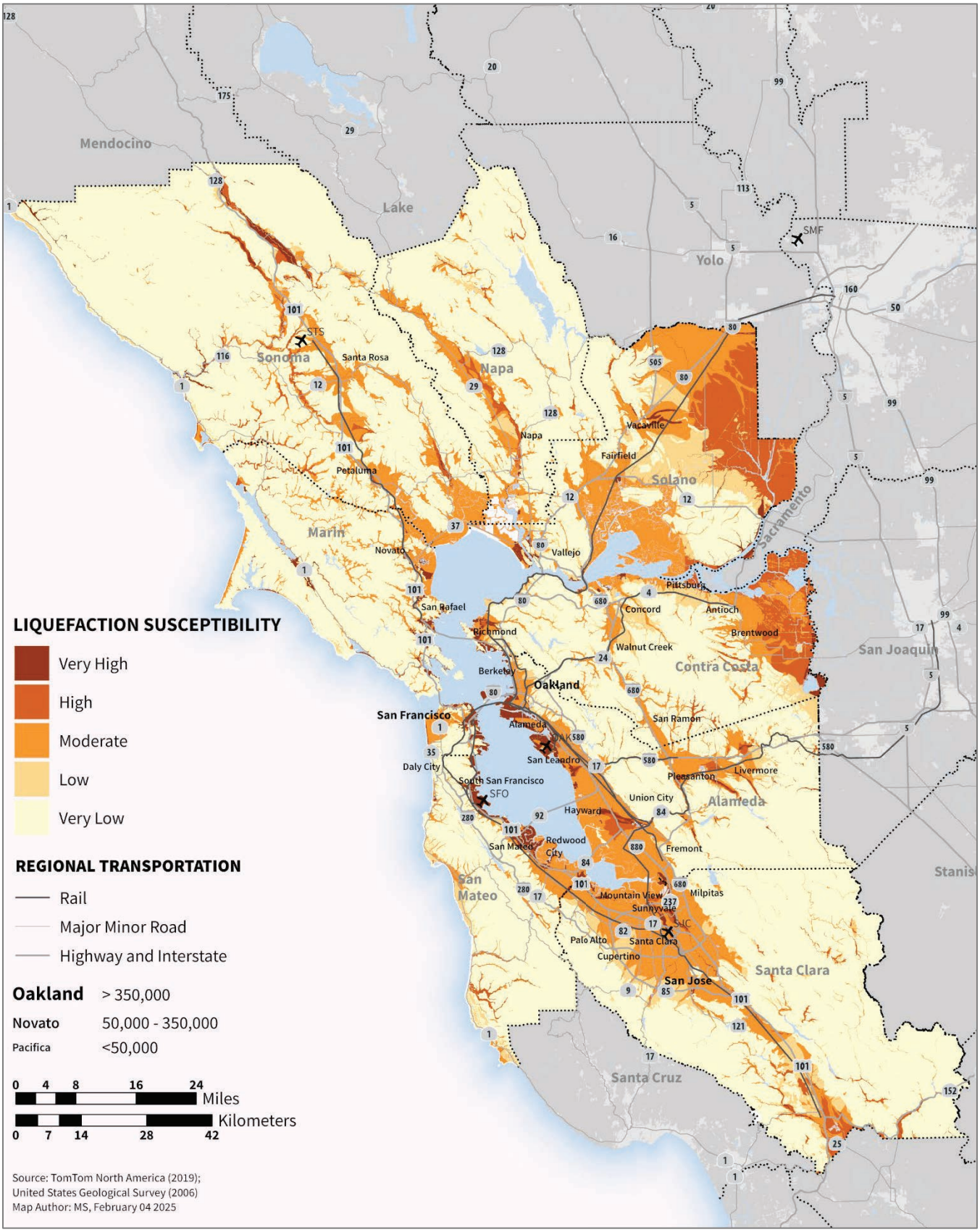
Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Settlement can occur from immediate settlement, consolidation, shrinkage of expansive soil, and liquefaction (discussed above). Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period of time and is followed by secondary compression, which is a continued change in void ratio under the application of the load. Soils tend to settle at different rates and by varying amounts, depending on the load weight, which is a phenomenon referred to as differential settlement. Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or the bay mud present in the marshland on the San Francisco Bay margin.

Figure 3.8-2: Ground Shaking Intensity



Sources: ABAG 2013; TomTom North America 2019.

Figure 3.8-3: Liquefaction



Sources: USGS 2006; TomTom North America 2019.

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments) related to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates).

Land Subsidence

Land subsidence can occur in areas experiencing significant declines in groundwater levels. When groundwater is extracted from aquifers in sufficient quantity, the groundwater level is lowered and the water pressure, which supports the sediment grains structure, decreases. In unconsolidated deposits, as aquifer pressures decrease, the increased weight from overlying sediments may compact the fine-grained sediments and permanently decrease the porosity of the aquifer and the ability of the aquifer to store water. In the Bay Area, historical land subsidence has been observed in the Santa Clara Valley, including Santa Clara County and portions of Alameda and San Mateo Counties, due to groundwater pumping (USGS n.d.-b). Most coastal areas along the San Francisco Bay are subject to subsidence, particularly in portions of the Cities of San Francisco and Foster City (Shirzaei and Bürgmann 2018).

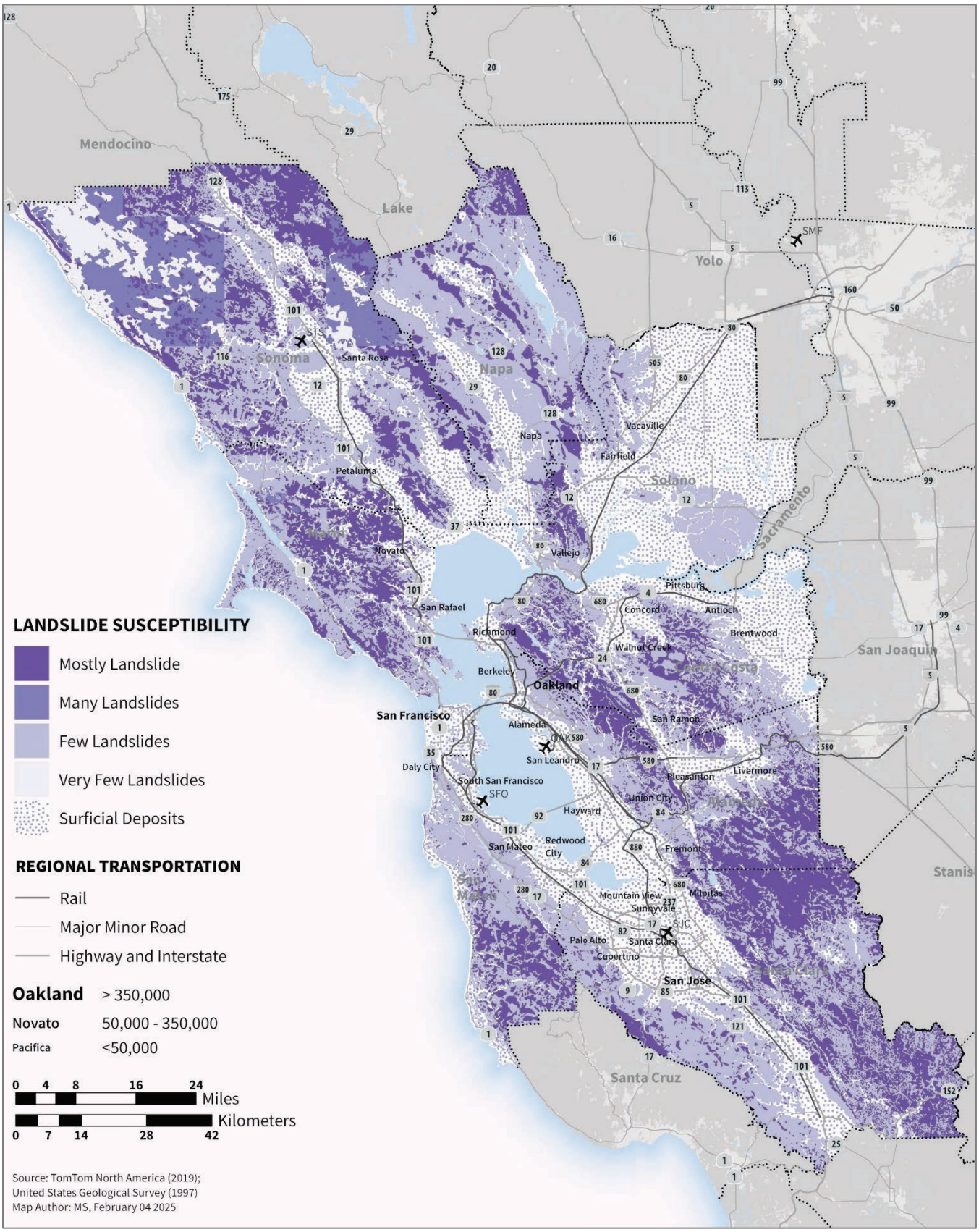
Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or by dynamic (i.e., earthquake) forces. A slope failure is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. Landslides may occur on slopes of 15% or less; however, the probability is greater on steeper slopes that exhibit old landslide features, such as scarps, slanted vegetation, and transverse ridges. Cutting into the slope and removing the lower portion, or slope toe, can reduce or eliminate the slope support, thereby increasing stress on the slope.

Landslide-susceptible areas are characterized by steep slopes and downslope creep of surface materials. Debris flows consist of a loose mass of rocks and other granular material that, if saturated and present on a steep slope, can move downslope. The rate of rock and soil movement can vary from a slow creep over many years to a sudden mass movement. Landslides occur throughout California, but the density of incidents increases in zones of active faulting.

Slope stability can depend on a number of complex variables. The geology, structure, and amount of groundwater in the slope affects slope failure potential, as do external processes (i.e., climate, topography, slope geometry, and human activity). The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. Slope failure under static forces occurs when those forces initiating failure overcome the forces resisting slope movement. For example, a soil slope may be considered stable until it becomes saturated with water (e.g., during heavy rains or because of a broken pipe or sewer line). Under saturated conditions, the water pressure in the individual pores within the soil increases, reducing the strength of the soil. Areas mapped by USGS as subject to rain-induced landslide hazards are shown in **Figure 3.8-4**. Areas classified as Mostly Landslides consist of mapped landslides and intervening areas between groups of mapped landslides. The Many Landslides designation also consists of mapped landslides and more extensive intervening areas than Mostly Landslides areas. Areas classified as Few Landslides contain few, if any, large, mapped landslides, but locally contains scattered small landslides and questionably identified larger landslides (USGS 1997).

Figure 3.8-4: Landslides



Sources: USGS 1997; TomTom North America 2019.

Earthquake motions can induce significant horizontal and vertical dynamic stresses in slopes that can trigger failure. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. Earthquake-induced landslide hazards have been mapped for only a portion of the plan area. Where mapping is available, the hazard areas generally coincide with the areas mapped as Mostly, Many, and Few Landslides.

PALEONTOLOGICAL SETTING

Important vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks (refer to geologic timescale in **Table 3.8-3**). Paleontological potential refers to the likelihood that a rock unit will yield a unique or significant paleontological resource. All sedimentary rocks, some volcanic rocks, and some low-grade metamorphic rocks have potential to yield paleontological resources. Depending on location, the paleontological potential of subsurface materials generally increases with depth beneath the surface, as well as with proximity to known fossiliferous deposits.

Table 3.8-3: Divisions of Geologic Time

Era	Period	Time in Millions of Years Ago (approximately)	Epoch
Cenozoic	Quaternary	< 0.01	Holocene
		2.6	Pleistocene
	Tertiary	5.3	Pliocene
		23	Miocene
		34	Oligocene
		56	Eocene
		65	Paleocene
Mesozoic	Cretaceous	145	--
	Jurassic	200	--
	Triassic	251	--
Paleozoic	Permian	299	--
	Carboniferous	359	--
	Devonian	416	--
	Silurian	444	--
	Ordovician	488	--
	Cambrian	542	--
Precambrian		2,500	--

Source: USGS 2010.

Pleistocene or older (older than 11,000 years) continental sedimentary deposits are considered to have a high paleontological potential while Holocene-age deposits (less than 11,000 years old) are generally considered to have a low paleontological potential because they are geologically immature and are unlikely to contain fossilized remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite), or because they have been altered under high heat and pressures, chaotically mixed or severely fractured. Generally, the processes that form igneous and metamorphic rocks are too destructive to preserve identifiable fossil remains.

Paleontological Resources

A search of the University of California Museum of Paleontology (UCMP) database at UC Berkeley was conducted on November 13, 2024. Records of paleontological finds maintained by the UCMP (UCMP 2024) state that there are approximately 5,829 sites at which fossil remains have been found in the Bay Area, with the greatest concentration of 2,578 occurring in Contra Costa County. San Mateo County has the second highest number of paleontological sites at 924. **Table 3.8-4** shows a breakdown of these paleontological resources by epoch of each site.

Table 3.8-4: Bay Area Recorded Paleontological Sites

	Alameda County	Contra Costa County	Marin County	Napa County	San Francisco County	San Mateo County	Santa Clara County	Solano County	Sonoma County
Holocene	5	5	11	0	57	73	5	86	11
Pleistocene	74	73	24	1	36	120	19	12	15
Pliocene	8	89	52	4	16	222	7	4	84
Miocene	241	1,150	24	9	3	27	53	8	24
Oligocene	0	137	0	0	0	5	2	0	0
Eocene	42	577	0	2	0	101	9	119	1
Paleocene	2	223	0	1	0	5	11	8	7
Cretaceous	51	110	0	76	1	51	30	35	10
Jurassic	13	2	1	23	0	0	9	0	0
Recent	50	90	241	3	83	305	8	8	379
Unknown	57	122	16	24	32	15	38	16	26
Total	543	2,578	369	143	228	924	191	296	557

Note: Multiple periods are identified for some sites listed in the University of California 2021 source. In those cases, the more recent period is identified in this table.

Source: UCMP 2024.

MINERAL RESOURCES

Most of the mineral resources in the Bay Area are located in the populated plains or valleys (rather than in the mountainous areas), which limits the potential for extraction. Nevertheless, substantial mineral resource extraction has occurred. More than 25 mineral commodities have been recovered in substantial quantities (Bailey and Harden 1975).

Table 3.8-5 lists key mineral resources in the Bay Area. The major mineral resources recovered in the Bay Area are (1) construction materials, such as limestone and oyster shells (used in manufacture of cement), sand and gravel, and crushed stone; (2) energy sources, such as gas, oil, and geothermal power; and (3) salines. Historically, most mineral products have been used locally, fulfilling a need for low-cost construction materials and a supply of energy (Bailey and Harden 1975).

Table 3.8-5: Bay Area Mineral Resources, by County

	Alameda County	Contra Costa County	Marin County	Napa County	San Francisco County	San Mateo County	Santa Clara County	Solano County	Sonoma County
Asbestos	X	X		X					
Chromite	X	X	X	X	X	X	X	X	X
Clay	X	X	X	X	X	X	X	X	X
Coal	X	X							
Copper	X	X	X	X			X		X
Diatomite		X		X					X
Expansible shale	X	X	X	X	X	X	X	X	X
Gemstones	X	X	X	X	X	X	X	X	X
Geothermal Resources				X					X
Limestone and shells	X	X	X	X		X	X	X	X
Magnesite	X			X			X		X
Manganese	X	X	X	X			X		X
Mercury	X	X	X	X	X	X	X	X	X
Mineral water		X	X	X		X	X		X
Oil and gas	X	X	X	X		X	X	X	X
Peat		X					X	X	
Pumice		X		X	X			X	X
Pyrite	X								
Salines	X		X	X		X	X	X	
Sand and gravel	X	X	X	X	X	X	X	X	X
Sands, specialty	X	X			X	X			
Silver				X					
Stone, crushed and broken	X	X	X	X	X	X	X	X	X
Stone, dimension	X	X	X	X	X	X	X	X	X
Stone, ornamental			X					X	
Sulfur, byproduct		X							

Source: Bailey and Harden 1975.

3.8.2 Regulatory Setting

FEDERAL REGULATIONS

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was enacted in 1977 to "reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program." To accomplish this, the act established the National Earthquake Hazard Reduction Program (NEHRP). NEHRP's mission includes improved understanding and

characterization of hazards and vulnerabilities, improvement of building codes and land use practices, risk reduction through post-earthquake investigations and education, development and improvement of design and construction techniques, improvement of mitigation capacity, development of alternative performance objectives to advance functional recovery, and accelerated application of research results. The NEHRP designates the National Institute of Standards and Technology as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Programs under the NEHRP help inform and guide planning and building code requirements, such as emergency preparedness responsibilities and seismic code standards.

US Geological Survey Landslide Hazard Program

The USGS Landslide Hazard Program provides information on landslide hazards, including information on current landslides, landslide reporting, real-time monitoring of landslide areas, mapping of landslides through the National Landslide Hazards Map, local landslide information, landslide education, and research.

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA2K) (Public Law 106-390) amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 to establish a predisaster mitigation program and new requirements for the federal postdisaster Hazard Mitigation Grant Program. DMA2K encourages and rewards local and state predisaster planning. It seeks to integrate state and local planning with an overall goal of strengthening statewide hazard mitigation. This enhanced planning approach enables local, tribal, and state governments to identify specific strategies for reducing probable impacts of natural hazards, such as floods, fires, and earthquakes. To be eligible for hazard mitigation funding, local governments are required to develop a hazard mitigation plan that incorporates specific program elements of the DMA2K law. In the Bay Area, all counties and most cities have adopted local hazard mitigation plan updates. Some cities have individual plans, while some counties have developed multijurisdictional updates that include all or many of the cities in the county.

Disaster Recovery Reform Act of 2018

The Disaster Recovery Reform Act was signed into law in 2018. The reforms acknowledge the shared responsibility for disaster response and recovery, are intended to reduce the complexity of the Federal Emergency Management Agency (FEMA), and build the nation's capacity for the next catastrophic event. The law, which amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act, contains 56 distinct provisions that require FEMA policy or regulation changes for full implementation. Examples of the provisions include expanding eligible hazard mitigation activities including the replacement of electric utility poles resilient to extreme winds (Section 1204) and earthquake early warning technology (Section 1233).

Clean Water Act Section 402

Section 402 of the Clean Water Act (33 US Code Section 1251 et seq.) establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. The act is also directly relevant to excavation and grading. The NPDES program controls water pollution by regulating point sources that discharge pollutants, including rock, sand, dirt, and agricultural, industrial, and municipal waste, into waters of the United States. The US Environmental Protection Agency has delegated to the State Water Resources Control Board the authority for the NPDES program in California, which is implemented by the state's nine regional water quality control boards (RWQCBs). Under the NPDES Phase II Rule, construction activity disturbing 1 or more acres must obtain coverage under the state's General Permit for Discharges of Storm Water Associated with Construction Activity (Construction Stormwater General Permit). As described further in Section 3.10, "Hydrology and Water Quality," the Construction Stormwater General Permit requires that applicants develop and implement a storm water pollution prevention plan (SWPPP), which specifies best

management practices (BMPs) that reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards and require inspections and maintenance of all BMPs.

National Pollutant Discharge Elimination System

The NPDES program is a federal program for addressing discharges that adversely affect the quality of our nation's waters. NPDES stormwater permits are what regulate the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies. Most states, including California, are authorized to implement the NPDES program and issue their own permits for stormwater discharges associated with construction activities. These permits generally can be thought of as umbrella permits that cover all stormwater discharges associated with construction activity for a designated period. Operators of individual construction sites then apply for coverage under the state's Construction Stormwater General Permit. In California, the State Water Resources Control Board adopted the 2022 Construction Stormwater General Permit (Order 2022-0057-DWQ), which went into effect on September 1, 2023.

Dischargers whose projects disturb 1 or more acres of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres are required to obtain coverage under the Construction Stormwater General Permit. Construction activity subject to this permit includes clearing, grading, and creating disturbances to the ground, such as stockpiling or excavating, but it does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction Stormwater General Permit requires the development of a SWPPP by a certified Qualified SWPPP Developer.

The California Green Building Code (CALGreen) requires the preparation of SWPPPs for projects that disturb less than 1 acre. CALGreen also requires postconstruction treatment control BMPs that improve stormwater runoff quality. It also requires that projects reduce peak runoff through the use of “low impact development” BMPs that indirectly reduce erosion.

International Building Code

The International Building Code (IBC) is published by the International Code Council, a nonprofit organization dedicated to developing a single set of comprehensive and coordinated national model construction codes. The IBC addresses health and safety concerns related to structural stability through prescriptive and performance-related requirements. California has used the IBC as the model code since January 1, 2008, using the 2006 IBC. The IBC is updated every three years, and the most recent version is the 2024 IBC.

STATE REGULATIONS

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act of 1972 (revised in 1994) is the state law that addresses hazards from earthquake fault zones and requires the delineation of zones along active faults. The purpose of this law is to mitigate surface fault rupture hazards by regulating development on or near active faults. As required by the act, the state has delineated Earthquake Fault Zones (formerly Special Studies Zones) along known active faults in California. Cities and counties must regulate certain development projects within these zones.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and from other hazards caused by earthquakes. This act requires the state geologist to delineate various seismic hazard zones and requires cities,

counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit may be granted for a site within a Seismic Hazard Zone, a geotechnical investigation of the site must be conducted, and appropriate mitigation measures incorporated into the project design.

The Bay Area includes numerous Seismic Hazard Zones for liquefaction and earthquake-induced landslides, as designated by the California Geological Survey (CGS). Any projects in these designated zones require evaluation and mitigation of potential liquefaction or landslide hazards, which must be conducted in accordance with CGS Special Publication 117A, adopted September 11, 2008, by the State Mining and Geology Board pursuant to the Seismic Hazards Mapping Act.

California Building Code

The California Building Code (CBC) has been codified in the CCR as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2022 CBC, which became effective on January 1, 2023, is based on the 2021 IBC published by the International Code Council. In addition, the CBC contains necessary California amendments, which are based on reference standards obtained from various technical committees and organizations, such as the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction, and the American Concrete Institute. ASCE Minimum Design Standard 7-05 (ASCE 7-05) provides requirements for general structural design and includes means for determining earthquake loads, as well as other loads (e.g., flood, snow, wind), for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure, or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients that are used to determine a Seismic Design Category (SDC) for a project as described in Chapter 16 of the CBC. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault) and SDC F (hospitals, police stations, emergency control centers in areas near major active faults). Design specifications are then determined according to the SDC in accordance with Chapter 16 of the CBC. Chapter 16, Section 1613 provides earthquake loading specifications for design and construction to resist the effects of earthquake motions in accordance with ASCE 7-05.

Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803); excavation, grading, and fills (Section 1804); load-bearing of soils (1806); foundations (Section 1808); shallow foundations (Section 1809); and deep foundations (Section 1810). Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. For SDC D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses mitigation measures to be considered in structural design, which may include ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

Specifically, Section 1803.7 of the CBC requires geologic and earthquake engineering reports for all proposed construction. The purpose of the engineering report is to identify geologic and seismic conditions that may require mitigation. The reports, which are prepared by a California certified engineering geologist in consultation with a California-registered geotechnical engineer, assess the nature of the site and potential for earthquake damage based on appropriate investigations of the regional and site geology, project foundation conditions, and potential seismic shaking at the site. These reports must consider the most recent CGS Note 48 (Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings), CGS Special Publication 42: Fault Rupture Hazard Zones in California (for project sites proposed within an Alquist-Priolo Zone), and the most recent version of CGS Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazard in California (for project sites proposed within a Seismic Hazard Zone). All conclusions must be fully supported by satisfactory data and analysis.

The geotechnical report required by Section 1803 provides completed evaluations of the foundation conditions of the site and the potential geologic and seismic hazards. It includes site-specific evaluations of design criteria related to the nature and extent of foundation materials, groundwater conditions, liquefaction potential, and settlement potential and slope stability, as well as the results of the analysis of problem areas identified in the engineering geologic report. The geotechnical report incorporates estimates of the characteristics of site ground motion provided in the engineering geologic report. The geotechnical report must be prepared by a geotechnical engineer registered in the state of California with the advice of the certified engineering geologist and other technical experts, as necessary. The approved engineering geologic report is submitted with, or as part of, the geotechnical report. Local jurisdictions in the proposed plan area typically regulate construction activities through a process that requires the preparation of a site-specific geotechnical investigation, consistent with Title 24, Part 2, Chapter 18 of the CBC.

CCR Title 24 also includes the California Residential Code and CALGreen, which have been adopted as separate documents (CCR Title 24, Part 2.5 and 11, respectively). CALGreen was the first state-mandated green building code in the nation. It establishes mandatory minimum green building standards and optional (more stringent) Tier 1 and Tier 2 provisions. Cities and counties have the discretion to adopt either tier as mandatory or to adopt their own more stringent standards. The green building standards included in CALGreen enhance the design and construction of buildings using planning and design concepts that reduce negative impacts on the environment through energy efficiency, water efficiency and conservation, and material conservation and resource efficiency. Sections 4.106.2 and 5.106.1 contain requirements intended to limit erosion related to development that would disturb less than one acre. The California Residential Code includes structural design standards for residential one- and two-family dwellings and covers all structural requirements for conventional construction. This part incorporates by adoption the 2021 International Residential Code of the International Code Council with necessary California amendments for seismic design. All other structures, including multifamily residential projects, are found in the other parts of the CBC, as discussed above.

California Department of Transportation Regulations and Seismic Design Criteria

The California Department of Transportation's (Caltrans's) jurisdiction includes rights-of-way (ROWs) of state and interstate routes within California. Any work within the ROW of a federal or state transportation corridor is subject to Caltrans regulations governing allowable actions and modifications. Caltrans issues permits to encroach on land within its jurisdiction to ensure that the encroachment is compatible with the primary uses of the state highway system, ensure safety, and protect the state's investment in the highway facility. The encroachment permit requirement applies to persons, corporations, cities, counties, utilities, and other government agencies. A permit is required for specific activities, including opening or excavating a state highway for any purpose, constructing or maintaining road approaches or connections, grading within ROWs on any state highway, and planting or tampering with vegetation growing along any state highway. The encroachment permit application requirements relating to geology, seismicity, and soils include information

on road cuts, excavation size, engineering and grading cross-sections, hydraulic calculations, and mineral resources approved under the Surface Mining and Reclamation Act of 1975 (SMARA).

Caltrans Seismic Design Criteria (SDC) were established after past California earthquakes caused damage to older structures designed according to nonductile design standards. As a result, Caltrans initiated an extensive seismic retrofit program to strengthen the state's inventory of bridges to ensure satisfactory performance in future earthquakes. Caltrans has funded an extensive research program and developed design procedures that have furthered the state of practice of earthquake bridge engineering. The SDC are an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC have a performance-based approach specifying minimum levels of structural system performance, component performance, analysis, and design practices for ordinary standard bridges. Bridges with nonstandard features or operational requirements above and beyond those of standard bridges may require a greater degree of attention than specified by the SDC.

California Surface Mining and Reclamation Act

SMARA mandated the initiation by the state geologist of mineral land classification to help identify and protect mineral resources in areas within the state subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Areas are classified into mineral resource zones based on the presence of deposits and how much evaluation of the resource has occurred.

SMARA also allowed the State Mining and Geology Board (SMGB), after receiving classification information from the state geologist, to designate lands containing mineral deposits of regional or statewide significance. Areas designated by SMGB are incorporated by regulation into Title 14, Division 2 of the CCR. Such designations require that a lead agency's land use decisions involving designated areas be made in accordance with its mineral resource management policies and that the lead agency consider the importance of the mineral resource to the region or the state as a whole and not just the lead agency's jurisdiction. In 1979, SMGB adopted guidelines for the management of mineral resources and preparation of local plans. The guidelines require local general plans to reference the state-identified mineral deposits and sites that are identified by the state geologist for conservation and/or future mineral extraction. Subsequently, SMGB identified urbanized areas where irreversible land uses precluded mineral extraction.

CGS has mapped mineral resource zones in parts of the Bay Area but has not created comprehensive digital maps for much of the plan area.

REGIONAL AND LOCAL REGULATIONS

City and County General Plans

Safety elements are one of the seven required elements of a general plan listed in Section 65302 of the California Government Code. Among other mandatory topics, the safety element establishes policies and programs to protect the community from risks associated with seismic and geologic hazards. Every city and county must consult with CGS and the Office of Emergency Services before adopting or revising a safety element.

Hazard Mitigation Plans

As discussed above (see "Disaster Mitigation Act of 2000"), cities and counties in the Bay Area adopt hazard mitigation plans. Most communities are on their third or fourth update with the majority of jurisdictions covered by an annex to a multijurisdictional plan at the county level. Some Bay Area cities have a local hazard mitigation plan adopted specific to their jurisdiction.

Local Building Codes

Local building codes, like the CBC, are generally customized versions of the IBC. Local boards, councils, and assemblies may exclude portions of the standard codes or adopt more specific requirements to regulate individual land use for the health, safety, and general welfare of the people.

Local Grading and Erosion Control Ordinances

Most counties and cities in the plan area have grading and erosion control ordinances. These ordinances control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants are typically required to submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit typically include a description of BMPs similar to those contained in a SWPPP.

3.8.3 Impact Analysis

SIGNIFICANCE CRITERIA

The following significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (Criterion GEO-1);
- directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking (Criterion GEO-2);
- directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction, lateral spreading, and subsidence (Criterion GEO-3);
- directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides (Criterion GEO-4);
- result in substantial soil erosion or the loss of topsoil (Criterion GEO-5);
- be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property (Criterion GEO-6);
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Criterion GEO-7); or
- result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or a locally-important mineral resources recovery site delineated on a local land use plan (Criterion MR-1).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on geology, seismicity, and mineral resources based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of

geology, seismicity, and mineral resources throughout the Bay Area. The baseline for the following analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025.

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county). For this impact assessment, a geographic information system (GIS) was used to digitally overlay the proposed plan's footprints associated with forecasted land use growth, sea level rise adaptation projects, and transportation projects onto Alquist-Priolo fault zones from CGS, probabilistic earthquake shaking hazard zones from ABAG, and earthquake liquefaction susceptibility and rainfall induced landslide hazard zones from USGS. Because the effects of seismic activity and geological conditions would be primarily related to operational impacts (effects on buildings and infrastructure following construction) the impact discussions are not separated by construction and operation.

This evaluation of geological, seismic, and mineral resource impacts assumes that construction and development under the proposed plan would adhere to applicable federal, state, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. For additional information on analysis methodology, refer to Section 3.1.3, "General Methodology and Assumptions."

IMPACTS AND MITIGATION MEASURES

Impact GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (LTS)

Land Use Impacts

Surface fault rupture could occur along any of the active fault traces or within the associated Alquist-Priolo Zone for the active faults within the proposed plan area. Although fault rupture is not entirely confined to the boundaries of an Alquist-Priolo Zone, the zone represents the known areas with the highest likelihood of rupture occurring based on historical evidence and geologic records. The risk outside these zones is considered acceptable based on established state regulations, including California Building Code (CBC) requirements tied to seismic risk in building design, and is, therefore, not considered substantial for purposes of this analysis. The amount and location of surface displacement would depend on the magnitude and nature of the seismic event. In some cases, surface fault rupture can cause displacement of the ground surface, resulting in substantial damage to foundations, roadways, and utilities. Buried thrust faults and inferred faults are also located within the boundaries of the proposed plan area; however, these fault types do not typically experience surface ruptures and are not officially recognized by the Alquist-Priolo Act. The proposed plan's land use growth footprint includes a variety of land uses (e.g., residential and commercial) that could potentially be exposed to hazards as a result of surface fault rupture.

The acreage of the proposed plan's land use growth footprint that either fully or partially intersect Alquist-Priolo Zones are listed below in **Table 3.8-6** for each county. Approximately 570 acres of the land use growth footprint is within an Alquist-Priolo Zone (**Table 3.8-6**).

Table 3.8-6: Acreage of Land Use Growth Footprint within Alquist-Priolo Zones

County	Total (acres)
Alameda	310
Contra Costa	100
Marin	<1
Napa	120
San Francisco	0
San Mateo	20
Santa Clara	20
Solano	1
Sonoma	9
Regional Total	570

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Sources: CGS 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Federal, state, and local laws, regulations, and programs in place and described herein avoid or reduce impacts from earthquakes and other seismic-related geologic hazards. To reduce impacts related to fault rupture, implementing agencies would require project sponsors to comply with provisions of the Alquist-Priolo Act for project sites located within or across an Alquist-Priolo Zone. Lead agencies must prepare site-specific fault identification investigations conducted by licensed geotechnical professionals in accordance with the requirements of the Act, as well as any existing local policies that exceed or reasonably replace any of the Alquist-Priolo Act's requirements. Fault identification studies required by the Alquist-Priolo Act involve on-site trenching and excavation for site-specific identification and location of fault rupture planes where any future rupture would be anticipated. Structures intended for human occupancy (defined in the Act as a structure that might be occupied more than 2,000 hours per year) must be located a minimum distance of 50 feet from any identified active fault traces. All projects would be required to adhere to design standards described in the CBC and all standard geotechnical investigation, design, grading, and construction practices to avoid or reduce impacts from earthquakes, ground shaking, ground failure, and landslides. Projects seeking a CEQA exemption through PRC Section 21155.1 are not eligible if the project site is subject to seismic risk as a result of being within a delineated earthquake fault zone or a seismic hazard zone (as determined pursuant to PRC Sections 2622 and 2696, respectively), unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of an earthquake fault or seismic hazard zone.

Regulatory agencies with oversight of development associated with the proposed plan have developed regulations and engineering design specifications that address and substantially reduce hazards associated with site-level geological and seismic conditions. Therefore, the impact related to fault rupture hazards would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Surface fault rupture could cause ground surface displacement, resulting in substantial damage to sea level rise adaptation projects. Different types of sea level rise adaptation projects would have different levels of sensitivity to the ground surface displacement. Marsh systems would likely be largely unaffected by lateral deformation while elevated roadways or levee systems would require design considerations. The acreage of the proposed plan's sea level rise adaptation projects footprint that either fully or partially intersects with Alquist-Priolo Zones are listed below in **Table 3.8-7** by county. Similar to the land use growth footprint and transportation projects footprint, the design of sea level rise adaptation projects in the Alquist-Priolo Zone would require site-specific investigations conducted by licensed geotechnical professionals to fully evaluate the level of potential damage from fault rupture. Depending on the agency with oversight for the infrastructure, construction and operation would be subject to applicable regulations from agencies such as the U.S. Army

Corps of Engineers (USACE) or the California Department of Water Resources (DWR). USACE follows seismic standards like ASCE/SEI 7-10 to set the site class designation that infrastructure must be designed to, and DWR requires a 200-year return period ground motion analysis for the design of infrastructure like levees. DWR has also established the Urban Levee Design Criteria, which include criteria related to seismic vulnerability.

The potential for adverse fault impacts related to sea level rise projects from implementation of the proposed plan would be less than significant (LTS).

Table 3.8-7: Acreage of Sea Level Rise Adaptation Projects Footprint within Alquist-Priolo Zones

County	Total (acres)
Alameda	0
Contra Costa	50
Marin	30
Napa	120
San Francisco	0
San Mateo	20
Santa Clara	0
Solano	110
Sonoma	500
Regional Total	820

Note: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Sources: CGS 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Transportation System Impacts

As noted above for the land use growth footprint, surface fault rupture could cause displacement of the ground surface, resulting in substantial damage to transportation projects including transit expansion projects, foundations, roadways, roadway interchanges, and utilities. Improvements associated with the transportation projects within the region would include a variety of different projects that could potentially be exposed to hazards as a result of surface fault rupture. There are approximately 170 acres associated with transportation projects that are within an Alquist-Priolo Zone and could be developed in conjunction with the proposed plan (see **Table 3.8-8**).

Table 3.8-8: Acreage of Transportation Projects Footprint within Alquist-Priolo Zones

County	Total (acres)
Alameda	100
Contra Costa	20
Marin	0
Napa	0
San Francisco	0
San Mateo	0
Santa Clara	0
Solano	30
Sonoma	10
Regional Total	170

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Sources: CGS 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

To reduce impacts related to fault rupture, implementing agencies require project sponsors to comply with provisions of the Alquist-Priolo Act for transportation project sites located within or across an Alquist-Priolo Zone. Project sponsors must prepare site-specific fault identification investigations conducted by licensed geotechnical professionals in accordance with the requirements of the Act, as well as any existing local or Caltrans regulations and policies that exceed or reasonably replace any of the Act's requirements. Projects such as interchange improvements to existing roadways that are located within an Alquist-Priolo Zone would not result in a substantial change to the risk or hazard but would nonetheless be constructed following preparation of a required geotechnical investigation to fully evaluate the level of potential damage from fault rupture. The potential for adverse fault impacts related to transportation projects from implementation of the proposed plan would be less than significant (LTS).

Conclusion

The forecasted development pattern, sea level rise adaptation project, and transportation project effects related to fault rupture hazards are site specific and dependent on the location of the individual projects in relation to the active fault traces. The Alquist-Priolo Act regulates where development and road projects can occur in relation to faults by requiring detailed fault identification studies and stipulating minimum setback requirements. Local agencies and Caltrans also have requirements to address impacts related to fault rupture. The potential for adverse fault impacts related to projected land use growth from implementation of the proposed plan therefore would be **less than significant (LTS)** because there are the existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these conditions to an acceptable level.

Mitigation Measures

None required.

Impact GEO-2: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking (LTS)

Land Use Impacts

According to modeling conducted by USGS in conjunction with CGS, the Bay Area has a nearly three in four chance of a magnitude 6.7 or greater earthquake over the 30-year period from 2014 to 2043 (USGS 2016). The shaking intensity of the next significant earthquake depends on the causative fault and the distance to the epicenter, the magnitude, the duration of shaking, and the characteristics of the underlying geologic materials. The potential for damage or loss during an earthquake of this magnitude could be substantial, especially in non-retrofitted older structures and infrastructure that were constructed under less stringent building codes. As shown in **Figure 3.8-2**, the entire Bay Area is classified as potentially experiencing very strong to violent ground shaking (MMI 7-9). **Table 3.8-9**, below, quantifies the area within the land use growth footprint potentially subject to very strong, severe, or violent ground shaking based on this data.

Table 3.8-9: Acreage of Land Use Growth Footprint Subject to Ground Shaking

	Very Strong – MMI 7 (acres)	Severe – MMI 8 (acres)	Violent – MMI 9 (acres)
Alameda	0	4,000	4,500
Contra Costa	290	6,500	930
Marin	0	810	100
Napa	4	860	0
San Francisco	0	2,000	760
San Mateo	0	760	1,700
Santa Clara	0	5,900	1,300
Solano	390	2,400	0

	Very Strong – MMI 7 (acres)	Severe – MMI 8 (acres)	Violent – MMI 9 (acres)
Sonoma	0	890	610
Regional Total	680	24,200	9,900

Note: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 2013; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In general, ground shaking is more severe in softer sediments, such as alluvial deposits where surface waves can be amplified, causing a longer duration of ground shaking compared to bedrock materials. Areas where bedrock is exposed or located at relatively shallow depth tend to experience surface waves from an earthquake as more of a sharp jolt, compared to other areas. Areas located within or near the Bay shoreline where alluvial sediments tend to be thicker, especially in areas where un-engineered fill or loose alluvial materials are found, could experience considerable ground shaking.

To reduce impacts related to ground shaking, implementing agencies would require project sponsors to comply with the applicable version of the CBC. Compliance with the regulatory requirements in the CBC and any applicable local ordinances and ensuring that structures are constructed in compliance with the law, is the responsibility of the project engineers and building officials (typically associated with the local jurisdiction). The geotechnical engineer, as a registered professional with the State of California, is required to comply with the CBC and local codes while applying standard engineering practice and the appropriate standard of care for the particular region in California.

Projected development must comply with Chapter 16, Section 1613 of the CBC, which provides earthquake loading specifications for structures and associated attachments that must also meet the seismic criteria of ASCE Standard 07-05. To determine seismic criteria for proposed improvements, geotechnical investigations would be prepared by state-licensed engineers and engineering geologists that provide recommendations for site preparation and foundation design, as required by Chapter 18, Section 1803 of the CBC. Geotechnical investigations would also evaluate hazards such as liquefaction, lateral spreading, landslides, and expansive soils in accordance with CBC requirements and CGS's Guidelines for Evaluating and Mitigation Seismic Hazards in California (Special Publication 117A, 2008), where applicable.

The geotechnical engineer is responsible for investigating the underlying soils and bedrock on a site and, if necessary, developing remedies to improve soil conditions based on standard engineering practices. The geotechnical investigation must characterize, log, and test soils and bedrock conditions and determine the response of those underlying materials to ground shaking generated during an earthquake. Seismic response to varying material types is particularly critical in the plan area, where construction may occur over soft clay and fills at the San Francisco Bay margin. The geotechnical investigation and the recommendations developed during the investigation must be presented in a report, which is reviewed, signed, and stamped by the professional engineer in charge. Based on the site's geotechnical conditions, the geotechnical report must include methods and materials for all aspects of the site development, including the site preparation, building foundations, structural design, utilities, and sidewalks and roadways, to remedy any geotechnical conditions related to seismic impacts. Once finalized, the geotechnical report would be submitted to the local permitting agency for review and comment. The local building officials work with the applicant and the geotechnical engineer to resolve inconsistencies and ensure that the investigation complies with the CBC and local ordinances. In connection with grading, foundation, building, and other site development permits, the local jurisdiction reviews the geotechnical investigation and recommendations and imposes permit requirements based on the geotechnical recommendations and CBC provisions. Recommended corrective measures, such as structural reinforcement and replacing native soils with engineered fill, must be incorporated into project designs. Developments must also adhere to local building code requirements for seismic safety, which identify

and require specified construction techniques that aid in structural resistance to ground shaking, as well as local general plans and zoning ordinances, where applicable policies exist.

As discussed above, state laws and local regulations require that potential seismic hazards be identified and remedied prior to construction. Reliable mechanisms are in place to enforce these regulations and the implementation of design approaches identified in required geotechnical investigations are anticipated to protect public health and safety from substantial risks through appropriate engineering practices. Therefore, the potential for adverse ground shaking impacts related to projected land use growth footprint from implementation of the proposed plan would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

As mentioned above, softer soils result in stronger shaking during earthquakes, which is one reason why all sea level rise adaptation projects sited around the bay and ocean shoreline are in the very strong and violent probabilistic earthquake shaking hazard zones (**Table 3.8-10**). Similar to land use and transportation projects, the design of sea level rise adaptation projects would be based on site-specific investigations conducted by licensed geotechnical professionals for each individual project site. Engineering professionals would then use the site-specific information to design infrastructure to withstand the corresponding level of shaking. Sea level rise adaptation projects may shore up existing shoreline infrastructure that was built before modern code, improving the seismic stability of flood protection assets that previously may have been more sensitive to earthquake shaking. The potential for adverse ground shaking impacts related to sea level rise adaptation projects from implementation of the proposed plan would be less than significant (LTS).

Table 3.8-10: Acreage of Sea Level Rise Adaptation Projects Footprint Subject to Ground Shaking

County	Very Strong – MMI 7 (acres)	Severe – MMI 8 (acres)	Violent – MMI 9 (acres)
Alameda	0	5,300	2,300
Contra Costa	10	2,800	1,600
Marin	0	2,900	13,100
Napa	0	3,900	160
San Francisco	0	1,400	180
San Mateo	0	5,500	2,500
Santa Clara	0	6,300	70
Solano	3	6,900	290
Sonoma	0	7,900	16,700
Regional Total	10	43,000	36,900

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 2013; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Transportation System Impacts

As noted above for the projected land use growth, an earthquake on any one of the active faults in the Bay Area region could cause a large degree of ground shaking, resulting in damage to transportation projects if they are not engineered appropriately. Further, the proposed transportation projects within the region would include a variety of transit modifications that could increase the number of people in transit corridors potentially exposed to ground shaking hazards. There are transportation projects totaling approximately 90 acres located in areas of very strong ground shaking, 5,200 acres located in areas of severe ground shaking, and 3,200 acres in areas of violent ground shaking (see **Table 3.8-11**).

Seismic design criteria would be required of all construction, including transportation projects, where adverse effects from ground shaking could occur. The most current applicable version of the CBC and local building standards require roadway projects to employ design standards that consider seismically active areas to safeguard against major structural failures or loss of life. Similarly, bridge and overpass design is required to comply with Caltrans' design criteria. Caltrans provides seismic design criteria for new bridges in California, specifying minimum levels of structural system performance, component performance, analysis, and design practices. Based on application of these requirements, the potential for adverse ground shaking impacts related to transportation projects would be less than significant (LTS).

Table 3.8-11: Acreage of Transportation Projects Footprint Subject to Ground Shaking

County	Very Strong – MMI 7 (acres)	Severe – MMI 8 (acres)	Violent – MMI 9 (acres)
Alameda	20	1,100	1,500
Contra Costa	60	560	490
Marin	0	120	20
Napa	0	0	3
San Francisco	0	110	30
San Mateo	0	350	460
Santa Clara	0	1,600	390
Solano	6	820	60
Sonoma	0	520	230
Regional Total	90	5,200	3,200

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Sources: USGS 2013; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Conclusion

The proposed plan would accommodate an increased population within the seismically active plan area. The degree of risk associated with the forecasted development pattern, sea level rise adaptation projects, and transportation projects is dependent on site-specific criteria, including the location of the projects in relation to the seismic event, underlying geologic materials, and magnitude of the event. Regulatory requirements exist that specify mandatory actions that must occur during project development to address these risks which exist across the entire proposed plan area. These impacts would be **less than significant (LTS)** because there are existing federal, State, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these conditions to an acceptable level.

Mitigation Measures

None required.

Impact GEO-3: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction, lateral spreading, and subsidence (LTS)

Land Use Impacts

Liquefaction typically occurs in areas underlain with loose, saturated, cohesion-less soils within the upper 50 feet of subsurface materials. These soils, when subjected to ground shaking, can lose their strength due to buildup of excess pore water pressure, causing them to function in a manner closer to a liquefied state. As shown in **Figure 3.8-3** there are many areas throughout the Bay Area region that are

prone to seismic-related ground failure. **Table 3.8-12** summarizes areas of the land use growth footprint that would be subject to liquidation from seismic ground failure.

Table 3.8-12: Acreage of Land Use Growth Footprint Susceptible to Liquefaction

County	Very Low Potential (acres)	Low Potential (acres)	Medium Potential (acres)	High Potential (acres)	Very High Potential (acres)
Alameda	670	880	3,900	120	2,800
Contra Costa	3,100	1,500	2,200	690	230
Marin	350	20	270	<1	260
Napa	220	290	330	20	4
San Francisco	800	70	580	7	1,300
San Mateo	810	250	850	60	440
Santa Clara	240	910	5,300	440	290
Solano	520	860	970	<1	470
Sonoma	440	150	810	40	60
Regional Total	7,200	4,900	15,200	1,400	5,900

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 2000, 2006; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Ground failure, including liquefaction, lateral spreading, and subsidence, as a result of an earthquake could occur in the plan area depending on the underlying conditions including ground water level, relative size of soil particles, and density of subsurface materials within 50 feet of ground surface. Damage from earthquake-induced ground failure associated with liquefaction, lateral spreading, and subsidence could be high in buildings with foundations not properly constructed for such hazards. The impacts from ground failure, including liquefaction, lateral spreading, and subsidence, from development of land uses associated with the proposed plan, would be addressed through site-specific geotechnical studies prepared in accordance with CBC requirements, the Seismic Hazards Mapping Act, and standard industry practices. The state provides guidance in CGS Special Publication 117A, which includes uniform guidelines for evaluating seismic hazards other than surface fault-rupture, as well as mitigation measure recommendations as required by PRC Section 2695(a). Chapters 6 and 7 of CGS Special Publication 117A provide standards for site evaluation and provide strategies that can be implemented to address liquefaction. These chapters also provide guidance to consider variations of liquefaction where soils laterally spread or subside. The guidance recommends that geotechnical evaluations determine the amount of liquefiable soil, which may provide an indication of the magnitude of subsidence and/or the presence of a gentle slope and open face, such as a river bank or shoreline, where lateral spreading can occur. The Seismic Hazards Mapping Act requires a geotechnical site-specific investigation before any parcel subdivisions or structure permits may be issued, to determine the strength of underlying soils or rock. Subsequent development (excavations, foundations, building frames, retaining walls, and other building elements) would be required to conform to the current seismic design provisions of the CBC to reduce potential losses from ground failure as a result of an earthquake. Section 1613 of the CBC states that projects located in liquefaction zones shall incorporate seismic design features into both grading and construction plans. Chapter 18 of the CBC includes the requirements of geotechnical investigations (Section 1803), as well as foundations (Section 1808). For SDC D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses measures to be considered in structural design, which may include ground stabilization, selecting appropriate foundation type and depths, selecting appropriate structural systems to accommodate anticipated displacements, or

any combination of these measures. These future projects would also be required to adhere to the local general plans and local building code requirements that contain seismic safety policies to resist ground failure through modern construction techniques. Therefore, the potential for adverse ground failure impacts related to the proposed plan's land use growth footprint would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Liquefaction hazard is generally greatest along the San Francisco Bay shoreline and along existing and historic riverine systems. Lateral spreading occurs when liquefaction occurs in a location with a gentle slope and an open face, making many of the sea level rise adaptation footprints with liquefaction exposure a likely location for lateral spreading to occur if soils liquify. Ground failure associated with liquefaction could result in damage to sea level rise adaptation projects if not engineered appropriately. Implementation of the proposed plan could result in sea level rise adaptation projects covering up to 5,100 acres of very low liquefaction hazard, 980 acres in areas classified as low liquefaction hazard, 55,000 acres in areas classified as medium liquefaction hazard, 1,700 acres in areas of high liquefaction hazard, and 9,400 acres in areas classified as very high liquefaction hazard (see **Table 3.8-13**). Sea level rise adaptation projects would be constructed in compliance with applicable versions of local, state, and federal standards that regulate the infrastructure, such as the USACE or DWR standards and regulations. Design criteria would require employing geotechnical practices such as ground treatment, replacing existing soils with engineered fill, or using deep foundation systems. The appropriate design approach would be dependent upon the unique conditions for each segment of shoreline and the various adaptation project types. The potential for adverse ground failure impacts related to sea level rise adaptation projects from implementation of the proposed plan would be less than significant (LTS).

Table 3.8-13: Acreage of Sea Level Rise Adaptation Projects Footprint Susceptible to Liquefaction

County	Very Low Potential (acres)	Low Potential (acres)	Medium Potential (acres)	High Potential (acres)	Very High Potential (acres)
Alameda	1	0	5,700	40	1,600
Contra Costa	120	150	2,400	340	1,240
Marin	2,200	260	9,500	210	2,500
Napa	400	0	2,200	300	120
San Francisco	150	3	90	0	1,300
San Mateo	1,500	490	3,500	80	1,700
Santa Clara	0	0	5,800	10	480
Solano	50	50	4,400	410	350
Sonoma	620	30	21,500	250	200
Regional Total	5,100	980	55,000	1,700	9,400

Note: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Sources: USGS 2000, 2006; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Transportation System Impacts

Although regional mapping of areas considered to have higher liquefaction potential has been conducted throughout the plan area, liquefaction hazards are generally determined on a site-specific basis. The areas that are exposed to liquefaction hazard may also have lateral spreading or differential settlement and subsidence concerns. Areas not at risk of liquefaction do not have lateral spreading potential. As noted above for development pursuant to the proposed plan, ground failure associated with liquefaction could result in damage to transportation projects if not engineered appropriately. Improvements associated with the proposed transportation projects within the region would include a variety of transit and roadway

modifications that could increase the number of people and transit corridors potentially exposed to liquefaction hazards. The proposed plan could result in transportation projects covering 1,500 acres of very low liquefaction hazard, 720 acres in areas classified as low liquefaction hazard, 4,800 acres in areas classified as medium liquefaction hazard, 490 acres in areas of high liquefaction hazard, and 970 acres in areas classified as very high liquefaction hazard (see **Table 3.8-14**).

Table 3.8-14: Acreage of Transportation Projects Footprint Susceptible to Liquefaction

County	Very Low Potential (acres)	Low Potential (acres)	Medium Potential (acres)	High Potential (acres)	Very High Potential (acres)
Alameda	380	130	1,700	240	300
Contra Costa	400	270	370	8	70
Marin	40	0	70	<1	30
Napa	0	0	2	0	0
San Francisco	70	5	5	0	60
San Mateo	180	40	240	20	330
Santa Clara	170	70	1,500	80	80
Solano	110	120	610	0	30
Sonoma	120	90	310	140	80
Regional Total	1,500	720	4,800	490	970

Note: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 2000, 2006; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Roadway projects must comply with the applicable version of the CBC and local building standards by employing geotechnical practices such as ground treatment, replacing existing soils with engineered fill, or using deep foundation systems to anchor improvements into more competent materials. Similarly, bridge and overpass design must comply with Caltrans design criteria. As stated above, Caltrans provides seismic design criteria for new bridges in California, specifying minimum levels of structural system performance, component performance, analysis, and design practices that would include minimizing damage that could be expected from potential ground failure hazards. Therefore, the potential for ground failure hazards, including liquefaction, lateral spreading, and subsidence, to result in adverse impacts related to the transportation projects would be less than significant (LTS).

Conclusion

Implementation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects would result in projects being constructed or redeveloped in areas that could be susceptible to ground failure due to liquefaction, lateral spreading, or subsidence. Ground failure hazards are dependent on site-specific conditions and other considerations, such as the severity of and duration of shaking in a seismic event. The impacts of ground failure, including liquefaction, lateral spreading, and subsidence on development of the land use growth footprint, sea level rise adaptation projects, and transportation projects in the proposed plan would be addressed through site-specific geotechnical studies required by local jurisdictions in accordance with standard industry practices and State-provided guidance, such as CGS Special Publication 117A. In addition, development would conform to the current seismic design provisions of the IBC and CBC to reduce potential losses from ground failure as a result of an earthquake. Proposed projects would also adhere to local general plans and local building code requirements that contain seismic safety requirements to resist ground failure through modern construction techniques. Therefore, ground failure hazards related to liquefaction, lateral spreading, and subsidence would be **less than significant (LTS)** because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these conditions to an acceptable level.

Mitigation Measures

None required.

Impact GEO-4: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides (LTS)

Land Use Impacts

The plan area includes a wide range of topographical conditions, and landslide hazards vary from very low in low lying areas to very high in some upland areas, especially areas with slopes that exceed 15%. **Figure 3.8-4** shows areas throughout the region that are considered prone to rain-induced landslide hazards. The proposed plan's strategies focus 73% of the land use growth footprint into the designated Growth Geographies; however, the remainder (27%) of the land use growth footprint is outside designated Growth Geographies but consistent with existing local land use plans (See **Table 2-3**). According to regional data, approximately 4,300 acres of the land use growth footprint are mapped as few landslides, less than 1 acre are mapped as many landslides, and approximately 810 acres are mapped as mostly landslides. **Table 3.8-15** summarizes the acreage of land use growth footprint within areas subject to landslides for each county.

Existing slopes and slope stability are considered in local land use planning and zoning, and areas within landslide zones tend to be designated for uses other than development. Approvals of development projects in areas subject to slope failures are also generally contingent on geologic and engineering studies that define and delineate potentially hazardous conditions and recommend adequate mitigation. The Seismic Hazard Mitigation Act addresses landslide hazards from earthquake shaking, requiring site evaluation in areas identified by the State. Earthwork recommendations for improved slope stability follow adopted State standards, such as the Guidelines for Evaluating and Mitigation Seismic Hazards in California (CGS 2008); incorporate site-evaluation findings; and inform the eventual engineered design of slope stabilization systems and other designed infrastructure. These documents are checked by the appropriate building official or engineer and may be reviewed by other departments of the county or city to check compliance with the laws and ordinances under their jurisdiction.

Future proposed developments must also be consistent with the CBC and adhere to the requirements for structural design, special inspections, and soils and foundations contained in Chapters 16 through 18 of the code. Local general plans and local building codes also often contain development policies to avoid landslides through construction design and slope stabilization techniques. Because local jurisdictions require a site-specific geologic investigation and analysis in accordance with standard industry practices and State-provided guidance, such as CGS Special Publication 117A, to minimize risk associated with landslides and because new development would be subject to local building codes and the CBC, which require implementation of design standards, the potential for adverse landslide impacts related to implementation of the proposed plan's land use growth footprint would be a less-than-significant (LTS) impact.

Table 3.8-15: Acreage of Land Use Growth Footprint within Landslide Zones

County	Few (acres)	Many (acres)	Mostly (acres)
Alameda	800	0	40
Contra Costa	1,700	0	520
Marin	290	0	100
Napa	30	0	8
San Francisco	320	0	20
San Mateo	280	0	20
Santa Clara	190	0	6
Solano	440	0	10

County	Few (acres)	Many (acres)	Mostly (acres)
Sonoma	210	<1	90
Regional Total	4,300	<1	810

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 1997; compiled by MTC and ABAG in 2025.

Sea Level Rise Adaptation Impacts

Most of the sea level rise adaptation projects are located on gently sloped terrain. **Table 3.8-16** summarizes the acreage of sea level rise adaptation projects footprint within areas subject to landslides by county. Sea level rise adaptation projects within landslide zones would follow the same process outlined in the "Transportation System Impacts" section, below, working with a geotechnical and engineering professional to identify slope stability hazards and slope stability measures that must be implemented to meet local, state, and federal standards. As noted above under "Land Use Impacts," there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with landslides. The Seismic Hazards Mapping Act requires a geotechnical site-specific investigation before any parcel subdivisions or structure permits are permitted. Subsequent development (excavations, foundations, building frames, retaining walls, and other building elements) would be required to conform to the current seismic design provisions of the CBC. DWR has established the Urban Levee Design Criteria, which includes criteria related to landside slope stability and landslides. Therefore, the potential for adverse landslide impacts related to sea level rise adaptation projects would be a less-than-significant (LTS) impact because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these conditions to an acceptable level.

Table 3.8-16: Acreage of Sea Level Rise Adaptation Projects Footprint within Landslide Zones

County	Few (acres)	Many (acres)	Mostly (acres)
Alameda	3	0	0
Contra Costa	1	0	<1
Marin	1,500	2	340
Napa	130	0	40
San Francisco	90	0	20
San Mateo	1,200	0	250
Santa Clara	0	0	0
Solano	10	0	0
Sonoma	290	0	210
Regional Total	3,100	2	860

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Sources: USGS 1997; compiled by MTC and ABAG in 2025.

Transportation System Impacts

Of the transportation projects, 1,200 acres would be located in areas mapped as few landslides, none would be located in areas mapped as many landslides, and 110 acres would be located in areas mapped as mostly landslides (see **Table 3.8-17**). Most of the transportation projects would be outside of landslide zones. Projects that would develop land identified as mostly landslides generally include construction of transportation system expansions, as well as corridor improvements. These hazards would generally be

addressed through compliance with existing regulations, as discussed in the "Land Use Impacts" section, above. The Caltrans Seismic Design Criteria require Project Specific Design Criteria (PSDC) for any projects that coincide with additional seismic hazards, which include landslides. As part of the PSDC process, a seismic safety peer review team would be established to check project designs. Transportation projects would be required to identify potential slope stability hazards and provide slope stabilization measures to meet the applicable version of the CBC and local building standards by employing geotechnical practices such as use of retaining walls, setback requirements, and deep foundation systems. Incorporation of slope stability measures would be effective in minimizing landslide hazards on proposed transportation projects. Therefore, the potential for landslide impacts related to the transportation projects at the regional level would be less than significant (LTS).

Table 3.8-17: Acreage of Transportation Projects Footprint within Landslide Zones

County	Few (acres)	Many (acres)	Mostly (acres)
Alameda	380	0	40
Contra Costa	410	0	9
Marin	20	0	30
Napa	0	0	0
San Francisco	20	0	0
San Mateo	20	0	9
Santa Clara	160	0	<1
Solano	100	0	20
Sonoma	110	0	8
Regional Total	1,200	0	110

Note: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: USGS 1997; compiled by MTC and ABAG in 2025.

Conclusion

Landslide hazards are dependent on site-specific conditions, including the steepness of slopes, and other conditions such as, in the case of seismically induced landslides, the distance and magnitude of the seismic event. Implementation of the forecasted development pattern, sea level rise adaptation projects, and transportation projects would result in projects being constructed or redeveloped in areas that could be susceptible to landslides. State and local standards have been developed to address this condition. Landslide hazards would have a **less-than-significant (LTS) impact** because there are existing requirements under federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these conditions to an acceptable level.

Mitigation Measures

None required.

Impact GEO-5: Result in substantial soil erosion or the loss of topsoil (LTS)

Land Use Impacts

Land use development associated with the proposed plan would include earthwork activities that could expose soils to the effects of erosion or loss of topsoil. Once disturbed, either through removal of vegetation, asphalt, or demolition of a structure, stockpiled soils may be exposed to the effects of wind and water. Generally, earthwork and ground-disturbing activities, unless below minimum requirements, require a grading permit, compliance with which minimizes erosion, and local grading ordinances ensure

that construction practices include measures to protect exposed soils such as limiting work to dry seasons, covering stockpiled soils, and use of straw bales and silt fences to minimize off-site sedimentation. Additional reports, such as a soil engineering report, engineering geology report, or plans and specifications for grading may be required by the local building or engineering departments, depending on the proposal. The application, plans, and specifications (if any) would be checked by the appropriate building official or engineer and may be reviewed by other departments of the county or city to ensure compliance with the laws and ordinances under their jurisdiction. Earthwork recommendations for improved erosion controls, based on site conditions, would be incorporated into the project construction documents.

Land use development that disturbs more than 1 acre is subject to compliance with a NPDES permit, including the implementation of BMPs, some of which are specifically implemented to reduce soil erosion or loss of topsoil, and the implementation of a SWPPP through the local jurisdiction. BMPs that are required under a SWPPP would include erosion prevention measures that have proven effective in limiting soil erosion and loss of topsoil. Projects that would disturb less than 1 acre would be subject to the CalGreen requirements related to stormwater drainage that have been designed to prevent or reduce discharges of sediments through BMPs that include on-site retention and filtration. Generally, once construction is complete and exposed areas are revegetated or covered by buildings, asphalt, or concrete, the erosion hazard is substantially eliminated or reduced.

Existing regulatory requirements specify mandatory and prescriptive actions that must occur during project development, and it is reasonable to assume compliance with existing regulations and permitting requirements of independent regulatory agencies to address potential project effects. Therefore, because there are regulations in place that would effectively reduce the potential for loss of topsoil or erosion impacts related to implementation of the proposed plan's land use growth footprint at the regional and local level, there would be a less-than-significant (LTS) impact.

Sea Level Rise Adaptation Impacts

Sea level rise adaptation projects could require the movement of large amounts of earthwork and ground-disturbing activities, which could result in erosion or loss of topsoil. The sea level rise adaptation projects, including restored marshes and levees, would in many instances reduce erosion; however, the projects could also result in erosion elsewhere. Additional hydromodification impacts are explored in Section 3.10, "Hydrology and Water Quality." Local, regional, state, and federal regulations and permit requirements will address potential project effects. As with the land use growth footprint, earthwork activities for sea level rise adaptation projects would be required to adhere to NPDES permit requirements for construction, as well as any local grading ordinance requirements that may include erosion prevention measures. One of the requirements of this permit is the implementation of nonpoint source control of stormwater runoff through the application of BMPs. Therefore, as described in the "Land Use Impacts" section, above, the potential for loss of topsoil or erosion impacts related to implementation of the proposed plan's sea level rise adaptation projects would result in a less-than-significant (LTS) impact.

Transportation System Impacts

Transportation projects within the region would also include earthwork activities that would disturb underlying soils during construction, potentially exposing them to erosion and loss of topsoil in the same manner discussed above for projected land use. Construction of additional lanes on freeways and other transportation facilities could result in loss of topsoil if work includes grading, trenching, excavation, or soil removal of any kind in an area not previously used as a paved transportation facility. As with the land use growth footprint, earthwork activities for transportation projects would be required to adhere to NPDES permit requirements for construction, as well as any local grading ordinance requirements that may include erosion prevention measures. Throughout California, the RWQCBs set erosion control standards because one of the major effects of grading is sedimentation of receiving waters. These control

standards are administered via the NPDES permit process for storm drainage discharge. One of the requirements of this permit is the implementation of nonpoint source control of stormwater runoff through the application of BMPs. A SWPPP would be required by the RWQCB to describe the BMPs that would control both the quality and amount of stormwater runoff on a project site. Transportation projects and development that would occur under the plan would be required to comply with this process.

Incorporation of erosion control BMP measures, such as use of straw bales, inlet protective measures, silt fences, and construction scheduling, in accordance with grading codes and any revegetation requirements, would be effective in minimizing erosion hazards and loss of topsoil associated with transportation projects. Therefore, the potential for loss of topsoil or erosion impacts related to the transportation projects included in the proposed plan is less than significant (LTS).

Conclusion

As noted above, construction associated with the forecasted development pattern, sea level rise adaptation projects, and transportation projects would include ground disturbance that could expose underlying soils to the effects of erosion. Existing regulatory requirements specify mandatory actions that must occur during project development that would address this potential impact. Therefore, this impact is **less than significant (LTS)** because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these activities to an acceptable level.

Mitigation Measures

None required.

Impact GEO-6: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property (LTS)

Land Use Impacts

Soils with high percentages of clay can expand when wet, causing structural damage to surface improvements. These clay soils can occur in localized areas throughout the San Francisco Bay Area region, making it necessary to survey project areas prior to construction. Expansive soils are generally removed during foundation work to avoid structural damage. The majority of projected growth occurs in already developed areas where expansive soils may have already been removed. However, expansive soils may remain in many parts of the plan area. Some projected land use growth associated with implementation of the proposed plan could be located on soils that exhibit expansive properties when exposed to varying moisture content over time that could result in damage to foundations, walls, or other improvements. Structures, including residential units and commercial buildings, could be damaged as a result of settlement or differential settlement where structures are underlain by materials of varying engineering characteristics.

All project-specific site designs would be reviewed and approved by the appropriate federal, state, and local agencies. Project-specific geotechnical investigations consistent with existing regulatory requirements would identify expansive soil conditions, which would be addressed through the integration of geotechnical site investigations that characterize the soil strength and profile before being incorporated into the design process for development projects. The site investigation would ensure site suitability for projects and inform any geotechnical measures to ensure long-term stability, ensuring that regional growth and projected land use changes on geologic units or soils that are expansive would not become unstable as a result of development. Compliance with CBC requirements and adherence to local building codes and ordinances would reduce hazards relating to expansive soils. The potential for expansive soils to result in adverse impacts related to projected land use growth from implementation of the proposed plan at the regional and local level would be a less-than-significant (LTS) impact.

Sea Level Rise Adaptation Impacts

As described above, the construction of new structures near or above unstable soil or geologic units would be largely addressed through the implementation of geotechnical recommendations in the planning and design process in accordance with local, state, and federal code and regulation requirements. Compliance with CBC requirements, adherence to local building codes and ordinances, as well as federal levee requirements, where relevant, would reduce hazards relating to expansive soils. Sea level rise adaptation projects on roadways or highways subject to review by the Federal Highway Administration (FHWA) would also be subject to compliance with FHWA regulations and design guidelines. The potential for adverse impacts related to sea level rise adaptation projects from implementation of the proposed plan would be less than significant (LTS).

Transportation System Impacts

Transportation projects within the plan area (e.g., transit, highway, local roadway, bicycle, and pedestrian modifications) could be located on unstable soil or geologic units. In general, many of the transportation projects would be in areas where previous roads or other improvements have occurred, and unstable soils or geologic units would have been addressed at the time of construction. However, some may have been addressed under older code requirements that may not be as stringent as current codes. Implementation of transportation projects, particularly projects involving large-scale ground disturbance during construction may expose people and structures to risks where located on expansive soils. Industry practice and state-provided guidance would minimize risk associated with geologic hazards. As described above for land use projects, the potential hazards of unstable soil or geologic units would be addressed through the implementation of geotechnical recommendations in the planning and design process. Preventative measures, such as structural reinforcement for unstable geologic units and using engineered fill to replace unstable soils, would be required for the design of individual future projects. All site designs would be reviewed and approved by the appropriate federal, state, and local agencies.

The potential for expansive soils to result in adverse impacts to the transportation projects at the regional and local level would be less than significant (LTS).

Conclusion

The proposed changes related to the forecasted development pattern, sea level rise adaptation projects, and transportation projects would be located on a range of different geologic materials and conditions. Hazards associated with unstable soils or geologic units are dependent on site- specific conditions, as well as the specific nature of the individual project proposed. With adherence to grading permit and building code requirements, including seismic design criteria as required by the CBC, and local building code requirements, the land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan would be designed to minimize potential risks related to expansive soils. Existing regulatory requirements specify mandatory and prescriptive actions that must occur during project development and would effectively reduce the inherent hazard. Therefore, this impact would be **less than significant (LTS).**

Mitigation Measures

None required.

Impact GEO-7: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (PS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Paleontological and geological resources are by nature specific to their local context, and as such, impacts on these resources resulting from the proposed plan would occur at the local level. Therefore, regional effects are not addressed. In general, potential impacts on paleontological or geologic resources would be similar to those identified for archaeological resources discussed under Impact CUL/TCR-2. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood to encounter these resources.

Table 3.8-4 shows a breakdown of these paleontological resources by epoch and county. There are 5,829 sites at which fossil remains have been found in the nine-county area, with the greatest concentration of 2,578 occurring in Contra Costa County and the second highest of 924 in San Mateo County. Napa County had the fewest paleontological sites at 143. Most paleontological resources were from the Miocene epoch (1,539), while the fewest were found from the Jurassic period (48).

The degree and extent of impacts would depend upon project location, and as such, project-specific analysis would be required to determine the precise area of impact and the importance of any paleontological or geologic resource identified within a proposed alignment or project area. This would be a potentially significant (PS) impact.

Conclusion

Because individual land use development projects, sea level rise adaptation projects, and transportation projects have the potential to adversely affect paleontological and geologic resources on a regional and localized level, these impacts would be **potentially significant (PS)**. Mitigation Measure GEO-7 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure GEO-7 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Ensure compliance with the Paleontological Resources Preservation Act, the Federal Land Policy and Management Act, the Antiquities Act, Section 5097.5 of the PRC, adopted county and city general plans, and other federal, state, and local regulations, as applicable and feasible, by adhering to and incorporating the performance standards and practices for the assessment and mitigation of adverse impacts on paleontological resources.
- Obtain review by a qualified paleontologist to determine whether the project has the potential to require ground disturbance of parent material with potential to contain unique paleontological resources or to require the substantial alteration of a unique geologic feature. The assessment should include museum records searches, a review of geologic mapping and the scientific literature, geotechnical studies (if available), and potentially a pedestrian survey if units with paleontological potential are present at the surface.
- Avoid exposure or displacement of parent material with potential to yield unique paleontological resources.
- Implement the following measures where avoidance of parent material with the potential to yield unique paleontological resources is not feasible:

- All on-site construction personnel shall receive Worker Education and Awareness Program training before the commencement of excavation work to understand the regulatory framework that provides for protection of paleontological resources and become familiar with diagnostic characteristics of the materials with the potential to be encountered.
- A qualified paleontologist shall prepare a paleontological resource management plan (PRMP) to guide the salvage, documentation, and repository of unique paleontological resources encountered during construction. If unique paleontological resources are encountered during construction, qualified paleontologist shall oversee the implementation of the PRMP.
- Ground-disturbing activities in parent material with a moderate to high potential to yield unique paleontological resources shall be monitored using a qualified paleontological monitor to determine whether unique paleontological resources are encountered during such activities, consistent with the specified or comparable protocols.

- Identify where ground disturbance is proposed in a geologic unit having the potential to contain fossils, and specify the need for a paleontological monitor to be present during ground disturbance in these areas.
- Avoid routes and project designs that would permanently alter unique geological features.
- Salvage and document adversely affected resources sufficient to support ongoing scientific research and education.
- If paleontological resources are discovered during earthmoving activities, the construction crew will be directed to immediately cease work and notify the implementing agencies and/or project sponsors. The project sponsor will retain a qualified paleontologist for identification and salvage of fossils so that construction delays can be minimized. The paleontologist will be responsible for implementing a recovery plan which could include the following:
  - in the event of discovery, salvage of unearthed fossil remains, typically involving simple excavation of the exposed specimen but possibly also plaster-jacketing of large and/or fragile specimens, or more elaborate quarry excavations of richly fossiliferous deposits;
  - recovery of stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including description of lithologies of fossil-bearing strata, measurement and description of the overall stratigraphic section, and photographic documentation of the geologic setting;
  - laboratory preparation (cleaning and repair) of collected fossil remains to a point of curation, generally involving removal of enclosing rock material, stabilization of fragile specimens (using glues and other hardeners), and repair of broken specimens;
  - cataloging and identification of prepared fossil remains, typically involving scientific identification of specimens, inventory of specimens, assignment of catalog numbers, and entry of data into an inventory database;
  - transferal, for storage, of cataloged fossil remains to an appropriate repository, with consent of property owner;
  - preparation of a final report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the curated collection; and
  - project sponsors shall comply with existing local regulations and policies that exceed or reasonably replace any of the above measures that protect paleontological or geologic resources.
- Prepare significant recovered fossils to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological curation facility.

- Following the conclusion of the paleontological monitoring, ensure that the qualified paleontologist prepares a report stating that the paleontological monitoring requirement has been fulfilled and summarizes the results of any paleontological finds. The report should be submitted to the CEQA lead agency and to the repository curating the collected artifacts and should document the methods and results of all work completed under the PRMP, including the treatment of paleontological materials; results of specimen processing, analysis, and research; and final curation arrangements.

Significance after Mitigation

Implementation of Mitigation Measure GEO-7 would reduce impacts associated with paleontological resources because construction workers would be alerted to the possibility of encountering paleontological resources, and professionally accepted and legally compliant procedures for the discovery of paleontological resources would be implemented in the event of a find. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact MR-1: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or a locally-important mineral resources recovery site delineated on a local land use plan (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

Local jurisdictions have general plan policies to manage mineral resources and are required under SMARA to consider significant mineral deposits identified by CGS. The proposed plan relies on local general plan development regulations to identify appropriate areas to protect and/or allow harvesting/mining of mineral resources. By developing more compactly, the proposed plan directs more growth to the areas that are already developed and away from undeveloped land. Harvesting/mining of mineral resources in or near urban development may create incompatibilities, and/or may be economically infeasible. Compact growth and urban infill allow for the preservation of non-urban areas where mineral resources may be more feasible to remove.

Local general plans, specific plans, and other land use plans include policies to protect existing and planned future mineral production and extraction activities from surrounding uses and require that future projects near mining activities have compatible land uses. In addition, the potential loss of availability of a designated mineral resource is a consideration in the final design of individual land use projects.

The forecasted development pattern, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan have been developed to most efficiently meet the demands created by the forecasted growth in population and jobs and focus mainly on development within designated Growth Geographies and the existing regional transportation system. Proposed transportation improvements would largely be constructed within existing ROWs. Sea level rise adaptation projects located along the San Francisco Bay shoreline are mostly adjacent to developed areas or transportation infrastructure. In addition, the potential loss of availability of a designated mineral resource is a consideration in the final design of individual land use, sea level rise adaptation projects, or transportation projects and are addressed through local general plan policies consistent with SMARA requirements. Therefore, the proposed plan would have a less-than-significant (LTS) impact.

Conclusion

Although implementing the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in development that would preclude the future extraction of mineral resources, these impacts would be less than significant because the projected land use growth was designed to be consistent with local planning documents, which are required to consider mineral resource zones mapped by the state in the land use decisions. Further, most development would be located in urban areas or within existing ROW for transportation-related uses where extraction of mineral resources is unlikely. This would be a **less-than-significant (LTS)** impact.

Mitigation Measures

None required.

3.9 HAZARDS AND WILDFIRE

This section evaluates the potential impacts related to hazards resulting from the implementation of the proposed plan. It describes the existing conditions for hazardous materials, airports, emergency planning, and wildland fires in the Bay Area. Environmental impacts associated with implementation of the proposed plan as they relate to these conditions are provided below. Impacts related to emission of toxic air contaminants along transportation routes are addressed in Section 3.4, "Air Quality."

No comments received in response to the Notice of Preparation were related to hazards and wildfire.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require they be considered. Consistent with these requirements, the comments received on the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of impacts in this section. Appendix B includes all comments received in response to the Notice of Preparation.

3.9.1 Environmental Setting

PHYSICAL SETTING

Generation and Disposal of Hazardous Materials and Waste

Materials and waste may be considered hazardous if they are poisonous (toxic); can be ignited by open flame (ignitable); corrode other materials (corrosive); or react violently, explode, or generate vapors when mixed with water (reactive). The term "hazardous material" is defined in the State of California's Health and Safety Code (HSC), Chapter 6.95, Section 25501(o) as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. In some cases, past industrial or commercial uses on a site have resulted in spills or leaks of hazardous materials and petroleum that caused contamination of underlying soil and groundwater. Federal and state laws require that soils and groundwater having concentrations of contaminants that are higher than certain acceptable levels are handled and disposed of as hazardous waste during excavation, transportation, and disposal. CCR Title 22, Sections 66261.20–66261.24, contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste. The use of hazardous materials and disposal of hazardous wastes are subject to numerous laws and regulations at all levels of government (see Section 3.9.2 "Regulatory Setting," below).

Various hazardous materials are commonly transported, stored, used, and disposed of in activities such as construction, industry (both light and heavy), dry cleaning, film processing, landscaping, automotive maintenance and repair, and common residential/commercial maintenance activities. The use, transport, storage, and disposal of hazardous materials is regulated by the US Environmental Protection Agency (EPA) and California Environmental Protection Agency (CalEPA) plus six boards, departments, and offices: California Air Resources Board (CARB), California Department of Pesticide Regulation, California Department of Toxic Substances Control (DTSC), Office of Environmental Health Hazard Assessment (OEHHA), State Water Resources Control Board (SWRCB), and California Department of Public Health Center for Environmental Health. State and local regulatory agencies closely monitor businesses and industry in the control of hazardous materials. Hazardous materials require special methods of disposal,

storage, and treatment, and any unintentional release of hazardous materials requires an immediate response to protect human health and safety, and the environment.

Transportation of Hazardous Materials and Waste

Hazardous materials, hazardous wastes, and petroleum products are a subset of the goods routinely shipped along the transportation corridors in the plan area. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. DTSC maintains a list of active registered hazardous waste transporters throughout California, and the California Department of Public Health regulates the haulers of hazardous waste. Three agencies maintain searchable databases that track hazardous material releases in reportable quantities: EPA maintains the Hazardous Materials Incident Report System, which contains data on hazardous material spill incidents reported to the US Department of Transportation (DOT); the California Office of Emergency Services (OES) maintains the California Hazardous Materials Incident Report System, which contains information on reported hazardous material accidental releases or spills; and SWRCB's Site Cleanup Program maintains information on reported hazardous material accidental releases or spills. DOT also provides grants to local agencies for preparing and training for hazardous materials incidents through its Hazardous Materials Emergency Preparedness Program, administered by OES.

Shipments of hazardous materials and wastes include a wide variety of chemicals, such as petroleum products, medical waste, and radioactive materials. Each movement of hazardous materials/wastes has a degree of risk, depending on the material being moved, the mode of transport, and numerous other factors. On a tonnage basis, petroleum products make up the majority—more than 80%—of hazardous material moved around the state.

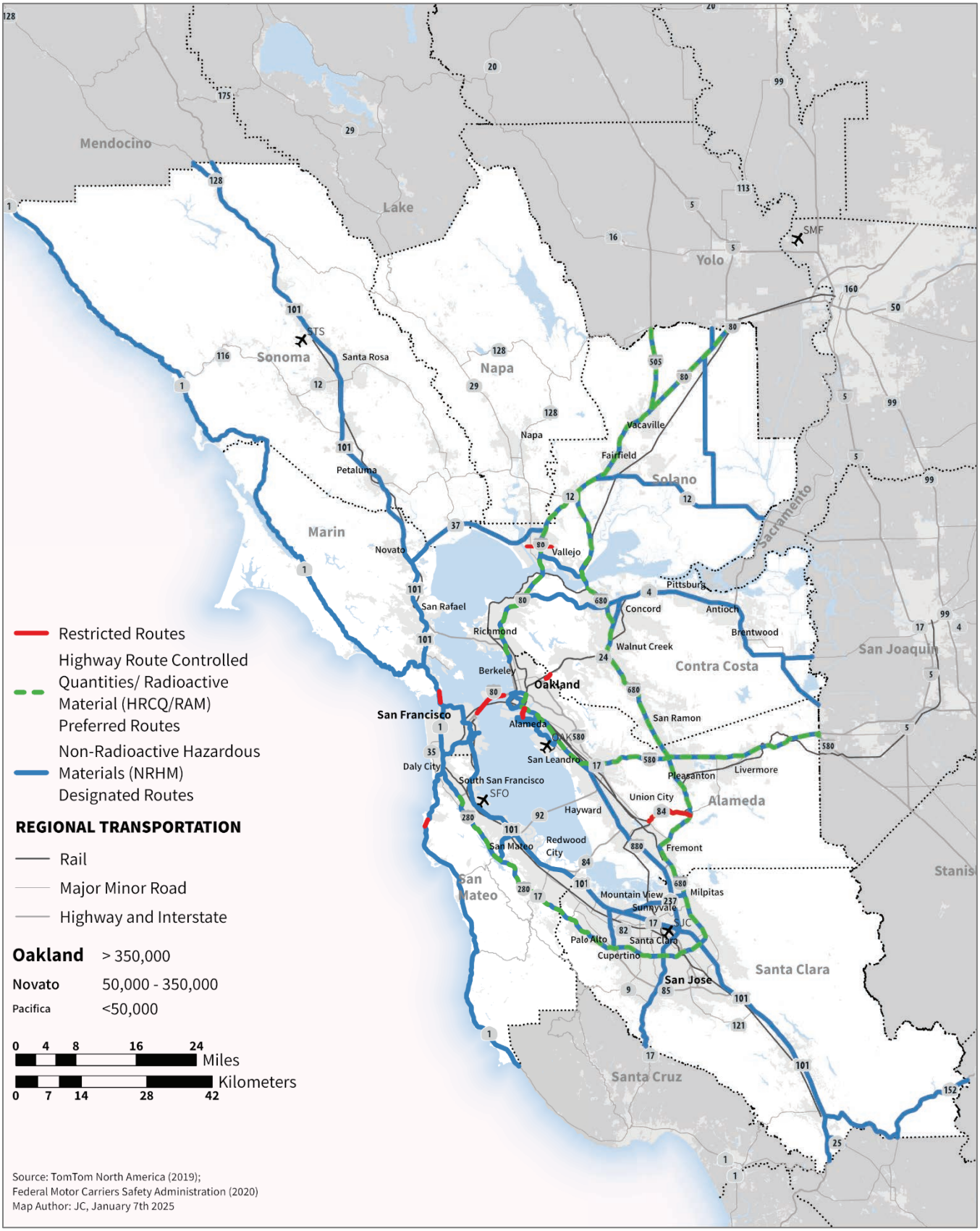
Truck

The transport of hazardous materials by truck is regulated by DOT. **Figure 3.9-1** identifies the hazardous materials routes established by DOT in the plan area. Hazardous materials transported by truck use many of the same freeways, arterials, and local streets as other traffic.

Railroads

The transport of hazardous materials by rail is also regulated by DOT. Freight railroads have employee safety training requirements and operating procedures that govern the handling and movement of hazardous goods, including crude oil. Industry and railroad-specific procedures cover employee training, train speeds, inspections, rail yard practices and locomotive operation. Federal regulations from various agencies, including the Federal Railroad Administration (FRA) and the Pipeline & Hazardous Materials Safety Administration (PHMSA), dictate safety practices in areas such as placement of railcars carrying certain commodities in the train "consist," hazmat routes, an inspection of equipment and track, speed restrictions and more. While federal regulations dictate the frequency of inspections, railroads often inspect their infrastructure with greater regularity than the federal government requires. In 2015, DOT released regulations requiring new, tougher tank car standards for certain types of hazmat, including crude oil. Older tank cars that do not meet new standards are being phased out. The Association of American Railroads maintains networks of on-call hazmat response contractors and environmental consultants to provide additional assistance. Upon request, railroads also share information with State and local officials on the types of cargo moving through their communities to inform emergency response planning. In partnership with the International Association of Fire Chiefs, the industry developed the AskRail app, which provides first responders across the rail network immediate access to accurate, timely data about what type of hazmat a rail car is carrying and how to respond to an incident safely. When a hazardous substance incident occurs, railroads work closely with government agencies and safety experts to immediately contain the situation, protect the health and safety of citizens and the environment, remediate any impacts and carefully return to service (AAR 2024).

Figure 3.9-1: Hazardous Material Routes



Source: TomTom North America 2019; FMCSA 2020.

Ship

The plan area includes several marine oil terminals and shipping routes used for the transport of various hazardous materials. The California State Lands Commission regulates marine oil terminals throughout California.

Transmission Pipelines

Underground (and in isolated instances, aboveground) pipelines are used to transport a variety of potentially hazardous substances throughout the plan area. The American Petroleum Institute recommends setbacks of 50 feet from petroleum and hazardous liquids lines for new homes, businesses, and places of public assembly. It also recommends 25 feet for garden sheds, septic tanks, and water wells and 10 feet for mailboxes and yard lights. The Transportation Research Board encourages the use of zoning regulations to minimize casualties in the event of a catastrophic rupture. Possible land use techniques include, for example, establishing setbacks; regulating or prohibiting certain types of structures and uses near transmission pipelines; and encouraging, through site and community planning, other types of activities and facilities (e.g., ministorage businesses, linear parks, recreational paths) within or in the vicinity of pipeline rights-of-way.

Potential Presence of Hazardous Materials in Soil and Groundwater

Hazardous materials, including pesticides and herbicides, heavy metals, volatile organic compounds, and oil and gas, may be present in soil and groundwater in areas where land uses have resulted in leaking fuel or chemical storage tanks or where other releases of hazardous materials have occurred. Land uses that typically involve the handling of hazardous materials include commercial or industrial operations, as well as agricultural areas where soils may contain pesticides and herbicides.

Various federal, state, and local regulatory agencies maintain lists of hazardous materials sites where soil and/or groundwater contamination is known or suspected to have occurred. These facilities are readily identified through regulatory agency database searches, such as SWRCB's GeoTracker online database; DTSC's EnviroStor online database; and several other federal, state, and local regulatory agency databases. These databases include closed sites that have been fully remediated; sites where contamination is contained but land use restrictions are in place; and sites under evaluation, active remediation, and monitoring. Sites listed on these databases are generally located in more densely populated areas with a history of light and heavy industrial uses. A large number of Bay Area sites are listed in these databases. The quantity of sites listed on two key databases (GeoTracker and EnviroStor) are summarized by county in **Table 3.9-1**.

Table 3.9-1: Documented Hazardous Materials Cleanup Sites in the Bay Area

Sites	Alameda County	Contra Costa County	Marin County	Napa County	San Francisco County	San Mateo County	Santa Clara County	Solano County	Sonoma County
GeoTracker cleanup sites	3,864	1,337	493	463	2,331	1,802	3,672	983	1,646
EnviroStor cleanup sites	653	381	71	32	182	223	718	103	103

Note: Sites may be listed on both databases.
Sources: DTSC 2024; SWRCB 2024.

To address the potential for documented and undocumented hazards on a site, the American Society for Testing and Materials has developed widely accepted practice standards for the preliminary evaluation of site hazards (E-1527-05). Phase I Environmental Site Assessments (ESAs) include an on-site visit to determine current conditions, an evaluation of possible risks posed by neighboring properties, interviews with persons knowledgeable about the site's history, an examination of local planning files to check prior

land uses and permits granted, file searches with appropriate agencies having oversight authority relative to water quality and/or soil contamination, examination of historic aerial photography of the site and adjacent properties, a review of current topographic maps to determine drainage patterns, and an examination of chain-of-title for environmental lines and/or activity and land use limitations. If a Phase I ESA indicates the presence or potential presence of contamination, a site-specific Phase II ESA is generally conducted to test soil and/or groundwater. Based on the outcome of a Phase II ESA, remediation of contaminated sites under federal and state regulations may be required prior to development. Phase I ESAs can also be used to identify the potential for presence of hazardous building materials in situations where older structures intended for demolition could contain lead-based paint, asbestos containing materials, mercury, or polychlorinated biphenyls. The Preliminary Endangerment Assessment (PEA) process, which is typically conducted for sites with DTSC oversight, is similar, but includes screening evaluations and public participation.

Naturally Occurring Asbestos

Asbestos is not a formal mineralogical term, but rather a commercial and industrial term historically applied to a group of silica-containing minerals that form long, very thin mineral fibers (termed amphiboles), which generally form in bundles, that were once widely used in commercial products. Naturally occurring asbestos (NOA) includes minerals in their natural state, such as in bedrock or soils. NOA, which was identified as a toxic air contaminant by CARB in 1986, is of concern due to potential exposures to the tiny fibers that can become airborne if asbestos-bearing rocks are disturbed by natural erosion or human activities, such as road building, excavations, and other ground-disturbing activities. Once disturbed, microscopic fibers can become lodged in the lungs, which can potentially lead to serious health problems. All nine Bay Area counties contain reported NOA and/or ultramafic rocks, such as serpentinite, which can contain asbestos fibers (USGS 2011). As shown in **Figure 3.9-2**, most of the reported asbestos occurrences are located in San Francisco and Marin Counties, while ultramafic rock occurrences are most prominent in Napa County. In general, NOA fibers do not pose a threat unless disturbed and introduced into the air as fugitive dust.

Schools

Children are particularly susceptible to long-term effects from emissions of hazardous materials. Therefore, locations where children spend extended periods of time, such as schools, are particularly sensitive to hazardous air emissions and accidental release associated with the handling of extremely hazardous materials, substances, or wastes. There are nearly 2,000 public schools located throughout the Bay Area with over 900,000 students, as described further in Section 3.13, “Public Services and Recreation.”

Airports

There are 25 public use airports in the Bay Area that serve commercial and general aviation users (see **Table 3.9-2** and **Figure 3.9-3**). This regional airport system forms an integral part of the Bay Area’s transportation network by providing links to communities throughout the United States and abroad. Bay Area communities must consider housing and economic development along with airport interests in making decisions concerning the amount and type of new development to allow in and near airport flight corridors. Potential hazards in relationship to airport operations are generally regulated by the Federal Aviation Administration (FAA), with local planning and evaluation of proposed projects (in terms of a proposed project’s compatibility in relationship to air and ground operations and the safety of the public) under the authority of the applicable airport land use commission (ALUC) through airport land use compatibility plans (ALUCPs).

Figure 3.9-2: Naturally Occurring Asbestos and Ultramafic Rocks



Source: USGS 2011; TomTom North America 2019.

Table 3.9-2: Public Use Airports and Military Airfields in the San Francisco Bay Area

County	Airport Name	Caltrans Classification
Alameda	Hayward Executive Airport	Metropolitan
Alameda	Livermore Municipal Airport	Metropolitan
Alameda	Oakland International Airport	Commercial/Primary
Contra Costa	Buchanan Field	Metropolitan
Contra Costa	Byron Airport	Community
Marin	Gnoss Field	Regional
Napa	Angwin Parrett Field Airport	Limited Use*
Napa	Napa County Airport	Regional
San Mateo	Half Moon Bay Airport	Regional
San Mateo	San Carlos Airport	Metropolitan
San Mateo	San Francisco International Airport**	Commercial/Primary
Santa Clara	Moffett Federal Airfield	Military/NASA
Santa Clara	Norman Y. Mineta San Jose International Airport (also referred to as San Jose International Airport)	Commercial/Primary
Santa Clara	Palo Alto Airport of Santa Clara County	Metropolitan
Santa Clara	Reid-Hillview Airport	Metropolitan
Santa Clara	San Martin Airport	Regional
Solano	Nut Tree Airport	Regional
Solano	Rio Vista Municipal Airport	Regional
Solano	Travis Air Force Base	Military/NASA
Sonoma	Charles M. Schulz - Sonoma County Airport	Commercial/Primary
Sonoma	Cloverdale Municipal Airport	Community
Sonoma	Healdsburg Municipal Airport	Community
Sonoma	Petaluma Municipal Airport	Regional
Sonoma	Sonoma Skypark	Community
Sonoma	Sonoma Valley Airport	Community

Notes: Caltrans = California Department of Transportation. There are no public use airports within the City and County of San Francisco.
* Privately owned airport that is open to the general public. Owned by Pacific Union College.
** The City and County of San Francisco owns and operates San Francisco International Airport.
Source: FAA 2024.

Figure 3.9-3: Public Use Airports



Source: TomTom North America 2019; Caltrans 2023.

WILDLAND FIRE

In California, responsibility for wildfire prevention and suppression is shared by federal, state, and local agencies. Federal agencies are responsible for federal lands in Federal Responsibility Areas. The State of California has determined that some nonfederal lands in unincorporated areas with watershed value are of statewide interest and have classified those lands as State Responsibility Areas (SRAs), which are managed by the California Department of Forestry and Fire Projection (CAL FIRE). All incorporated areas and other unincorporated lands are classified as Local Responsibility Areas (LRAs).

While all of California is subject to some degree of wildfire hazard, there are specific features that make certain areas more hazardous. CAL FIRE is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors (PRC Sections 4201–4204 and Government Code Sections 51175–51189). Factors that increase an area's susceptibility to fire hazards include slope, vegetation type and condition, and atmospheric conditions, as described further below.

Wildfire Behavior and Controlling Factors

Wildfire behavior is a product of several variables—primarily weather, vegetation, topography, and human influence—that combine to produce local and regional fire regimes that affect how, when, and where fires burn. The fire regime, meanwhile, is characterized by several factors, including fire frequency, intensity, severity, and area burned.

Human Influence on Wildfire

Human influence on wildfire includes direct influences, such as the ignition and suppression of fires, and indirect influence through climate change, the alteration of native vegetation, fire suppression, and development patterns. Human-induced wildfire ignitions can change fire regime characteristics in two ways: (1) changing the distribution and density of ignitions and (2) changing the seasonality of burning activity (Balch et al. 2017). Human-induced ignition sources include escapes from debris and brush-clearing fires, electrical equipment malfunctions, campfires, smoking, fire play (e.g., fireworks), vehicles, and arson. Consequently, areas near human development more frequently experience fires than very remote or urban areas (Syphard et al. 2007; Mann et al. 2016; Balch et al. 2017).

Once a fire is started, the spread and behavior of a fire become a function of fuel characteristics, terrain, and weather conditions (Syphard et al. 2008). Development that has spread into less densely populated, often hilly areas has increased the number of people living in heavily vegetated areas that are prone to wildfire. This area where wildlands meet urban development is referred to as the wildland-urban interface (WUI) and is subject to urban wildfire. Nationwide, the number of houses in the WUI increased by 41% between 1990 and 2010 (Radeloff et al. 2018), and an estimated 95% of wildfires in California are caused by people (Syphard et al. 2007).

Fire Fuel Management

People have intervened deliberately and dramatically in the natural fire regime through fire suppression and, more recently, actions that affect fuel connectivity. Historically, fire suppression was used to prevent and limit wildfires. Although an important practice in limiting fire spread, over time, this land management practice (combined with forest regrowth after extensive logging in the late 19th century) has led to a buildup of forest fuels and an increase in the occurrence and threat of large, severe fires (Westerling et al. 2006).

However, contemporary fire management practices include fuel management activities that are intended to reduce the intensity and severity of wildfires. In March of 2022, California's Wildfire and Forest Resilience Task Force released its Strategic Plan for Expanding the Beneficial Use of Fire. The document details a roadmap for significantly increasing the pace and scale of prescribed fire, cultural burning, and fire managed for resource benefit as forest management activities. Reducing fuels through mechanical treatments and prescribed fire have been found to be effective at reducing fire frequency, fire severity,

and annual area burned when applied at the landscape scale over an extended period of time (Ecological Restoration Institute 2013; Martinson and Omi 2013; Prichard and Kennedy 2014; Tubbesing et al. 2019).

Climate Change and Wildfire

Wildfire activity is closely related to temperature and drought conditions, and in recent decades, increasing drought frequency and warming temperatures have led to an increase (Westerling et al. 2006; Schoennagel et al. 2017). In particular, the western United States, including California, has seen increases in wildfire activity in terms of area burned, number of large fires, and fire season length (Westerling et al. 2006; Abatzoglou and Williams 2016). These conditions have resulted in the largest, most destructive, and deadliest wildfires on record in California history.

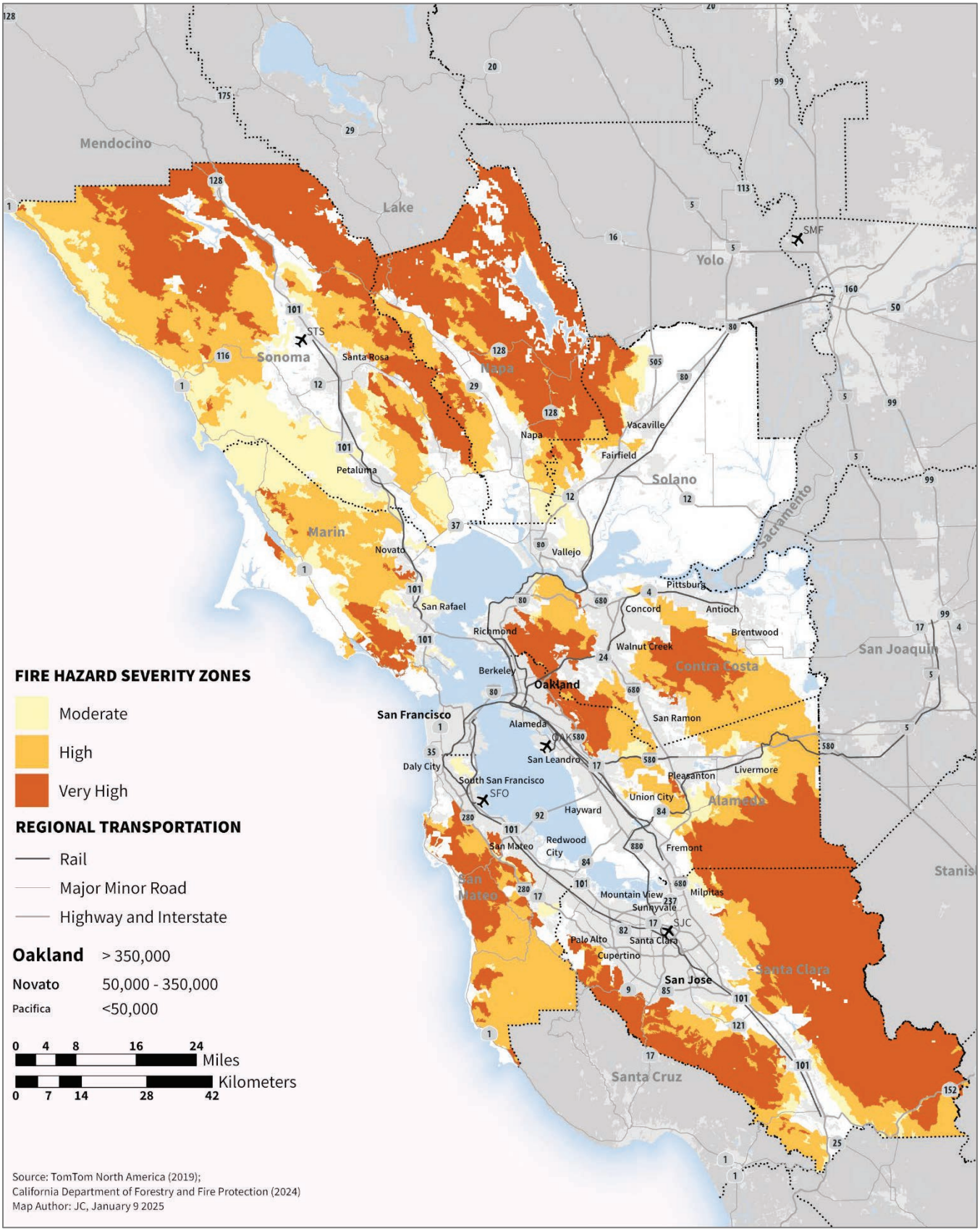
Climate change is expected to continue to produce conditions that facilitate a longer fire season, which, when coupled with human-caused changes in the seasonality of ignition sources, will produce more, longer, and bigger fires during more times of the year. According to California's Fourth Climate Change Assessment, Statewide Summary Report (LCI et al. 2018a), if greenhouse gas emissions continue to rise, the frequency of extreme wildfires burning over 25,000 acres could increase by 50% by 2100, and the average area burned statewide could increase by 77% by the end of the century (LCI et al. 2018b). Refer to Section 3.6, "Climate Change, Greenhouse Gases, and Energy," for additional discussion of climate change trends and the effects of climate change on the environment.

Wildfire Conditions in the Plan Area

The Fire Hazard Severity Zone (FHSZ) maps were last updated by CAL FIRE in 2024 to more accurately reflect the zone within SRAs in California that are susceptible to wildfire. Throughout the Bay Area, there is a full range of conditions and fire hazards as indicated in **Figure 3.9-4**, with all Bay Area counties except San Francisco having areas of High and Very High Fire Hazard in areas of CAL FIRE responsibility. The areas of greatest wildfire hazard are concentrated in the hillside areas of San Mateo, Santa Clara, Sonoma, and Napa Counties, with smaller hazard areas in Marin County, the East Bay Hills of Alameda and Contra Costa Counties, and on the slopes of Mount Diablo. After adoption of the SRA FHSZ maps, CAL FIRE has also made recommendations for FHSZ in LRAs to provide guidance to local agencies. CAL FIRE's FHSZ recommendations for LRAs in Bay Area counties were drafted and released for public review in February 2025. Areas of High and Very High Fire Hazard in LRAs are in all Bay Area counites (CAL FIRE 2025). Each local agency has the authority to expand the LRAs or increase the designations based on CAL FIRE's recommendations.

Wildfires tend to be larger under drier atmospheric conditions and when fed by drier fuel sources (Balch et al. 2017). In 2020, several large fires occurred in California as a result of lightning storms coupled with dry fuels. The fifth largest fire in recent California history, the SCU Lightening Complex fires, burned 396,625 acres in Stanislaus, Santa Clara, Alameda, Contra Costa, and San Joaquin Counties in August 2020. At the same time, the LNU Lightening Complex fire burned an additional 363,220 acres in Sonoma, Lake, Napa, Solano, Colusa and Yolo Counties (CAL FIRE 2024a). In 2017, the Tubbs Fire caused substantial destruction in parts of Napa and Sonoma Counties. Believed to have been started by a private electrical system, the fire is the second most destructive in recent California history. The Tubbs fire damaged 5,636 structures and resulted in 22 deaths, with much of the destruction in Santa Rosa. The 1991 Tunnel fire in the Oakland Hills above Berkeley and Oakland, an urban wildfire, resulted in 25 deaths and the loss of 2,900 structures. It remains the third most destructive wildfire in California history (CAL FIRE 2024b). A fire along the WUI can result in major losses of property and structures.

Figure 3.9-4: Fire Hazards



Source: TomTom North America 2019; CAL FIRE 2024acaltrans .

3.9.2 Regulatory Setting

FEDERAL REGULATIONS

EPA is the lead agency responsible for enforcing federal regulations that affect public health or the environment. The primary federal laws and regulations include the Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments enacted in 1984; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Act and Reauthorization Act of 1986 (SARA). Federal statutes pertaining to hazardous materials and wastes are contained in CFR Title 40, Protection of the Environment.

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 (15 US Code Section 2601 et seq.) grants EPA the authority to develop reporting, record-keeping, and testing requirements for, as well as restrictions on, the manufacture, use, and sale of chemical substances.

Resource Conservation and Recovery Act

RCRA Subtitle C regulates the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms per month or more) through comprehensive life cycle or "cradle to grave" tracking requirements. The requirements include maintaining inspection logs of hazardous waste storage locations, records of quantities being generated and stored, and manifests of pickups and deliveries to licensed treatment/storage/disposal facilities. RCRA also identifies standards for treatment, storage, and disposal, which is codified in CFR Title 40 Part 260.

Comprehensive Environmental Response Compensation and Liability Act

Congress enacted CERCLA, setting up what has become known as the Superfund program, in 1980 to establish prohibitions and requirements concerning closed and abandoned hazardous waste sites, provide for liability of persons responsible for releases of hazardous waste at these sites, and establish a trust fund to provide for cleanup when no responsible party can be identified. Generally, CERCLA authorizes two kinds of response actions:

- short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response, and
- long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening.

Superfund Amendments and Reauthorization Act

SARA amended CERCLA in 1986, emphasizing the importance of permanent remedies and innovative treatment technologies to clean up hazardous waste sites, requiring Superfund actions to consider the standards and requirements found in other state and federal environmental laws and regulations, providing new enforcement authorities and settlement tools, increasing involvement of the states in every phase of the Superfund program, increasing the focus on human health problems posed by hazardous waste sites, encouraging greater citizen participation in making decisions on how sites should be cleaned up, and increasing the size of the trust fund to $8.5 billion.

Emergency Planning Community Right-to-Know Act

The Emergency Planning Community Right-to-Know Act (EPCRA), or SARA Title III, was enacted in October 1986. SARA Title III requires any infrastructure at the state and local levels to plan for chemical emergencies, including identifying potential chemical threats. Reported information is then made publicly

available so that interested parties may become informed about potentially dangerous chemicals in their community. EPCRA Sections 301–312 are administered by EPA's Office of Emergency Management. EPA's Office of Information Analysis and Access implements EPCRA's Section 313 program. In California, SARA Title III is implemented through the California Accidental Release Prevention Program (CalARP).

Code of Federal Regulations, Title 29

The Occupational Safety and Health Act (29 CFR Section 1910.120) establishes regulations for employers that provide employees with an environment free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. Pursuant to Occupational Safety and Health Administration regulations, standard accident training for cleaning up small spills would be provided to all individuals prior to their work with hazardous substances, and the appropriate types and amounts of spill cleanup materials and personal protective equipment would be immediately available.

National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for Hazardous Air Pollutants is an Environmental Protection Agency (EPA) standard that is applicable within the United States to the emissions of hazardous air pollutants produced by corporations, institutions and at Agencies at all levels of government. The hazardous air pollutants are those pollutants that are known or suspected to cause cancer, serious health effects, or adverse environmental effects.

Code of Federal Regulations, Title 14, Part 77

FAA's primary role is to promote aviation safety and control the use of airspace. Public use airports that are subject to FAA's grant assurances must comply with specific FAA design criteria, standards, and regulations. Land use safety compatibility guidance from FAA is limited to the immediate vicinity of the runway, the runway protection zones at each end of the runway, and the protection of navigable airspace. FAA enforces safety standards and investigates and corrects violations, as appropriate.

Title 14, Part 77 of the CFR, *Safe Efficient Use and Preservation of the Navigable Airspace,* establishes the federal review process for determining whether proposed development activities in the vicinity of an airport have the potential to result in a hazard to air navigation. 14 CFR Part 77 identifies criteria that govern which projects require notice to be filed with FAA, as well as identifying standards for determining whether a proposed project would represent an obstruction "that may affect safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities." Objects that are identified as obstructions based on these standards are presumed to be hazards until an aeronautical study conducted by FAA determines otherwise.

14 CFR Part 77.9, *Construction or Alteration Requiring Notice*, indicates that notice must be filed with FAA for any construction or alteration of objects within 20,000 feet of a public use airport runway when the height of the objects exceeds (i.e., is taller than) an imaginary surface with a 100:1 (1 foot upward per 100 feet horizontally) slope from the nearest point of the nearest runway. This requirement applies when the airport has at least one runway that exceeds 3,200 feet in length; for shorter runways, the notification surface has a 50:1 slope and extends 10,000 feet from the runway. For heliports, the notification surface has a 25:1 slope and extends 5,000 feet from the helicopter takeoff and landing area, commonly referred to as final approach and takeoff area. The notification requirements apply to all public-use airports, military airports, and heliports. When FAA notification is required, it must be provided using FAA Form 7460-1, Notice of Proposed Construction or Alteration.

Hazardous Materials Transportation Act

The transportation of hazardous materials is regulated by the Hazardous Materials Transportation Act (HMTA), which is administered by the Research and Special Programs Administration of DOT. HMTA

provides DOT with a broad mandate to regulate the transport of hazardous materials, with the purpose of adequately protecting the nation against risk to life and property, which is inherent in the commercial transportation of hazardous materials. The HMTA governs the safe transportation of hazardous materials by all modes. DOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, causes to be transported or shipped, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. DOT regulations govern every aspect of the movement, including packaging, handling, labeling, marking, placarding, operational standards, and highway routing. Additionally, DOT is responsible for developing curriculum to train for emergency response and administers grants to states and Indian tribes for ensuring the proper training of emergency responders.

Code of Federal Regulations, Title 49

Title 49, Transportation, of the CFR includes hazardous materials regulations in the volume containing Parts 100–185 and governs the transport of hazardous materials in all modes of transportation: air, highway, rail, and water. Hazardous materials regulations are subdivided by function into four basic areas: Procedures and/or Policies (49 CFR Parts 101, 106, and 107), Material Designations (49 CFR Part 172), Packaging Requirements (49 CFR Parts 173, 178, 179, and 180), and Operational Rules (49 CFR Parts 171, 173, 174, 175, 176, and 177).

Pipeline and Hazardous Materials Safety Administration Hazardous Materials Regulations

The Pipeline and Hazardous Materials Safety Administration is the federal regulator for the movement of hazardous materials by rail. Regulations cover product classification, operating rules, and tank car standards.

Federal Railroad Administration Office of Railroad Safety

The Federal Railroad Administration's Office of Railroad Safety promotes and regulates safety throughout the nation's railroad industry. The office executes its regulatory and inspection responsibilities through a diverse staff of railroad safety experts. The staff includes nearly 400 Federal safety inspectors who specialize in one of six technical disciplines focusing on compliance and enforcement in: grade crossings, hazardous materials, motive power and equipment, operating practices, signal and train control, and track (FRA 2024a). The Safety Management Teams (SMTs) serve as the Office of Railroad Safety's main liaison with the senior leadership of the Nation's railroads. Each of the nine SMTs is assigned to either a Class I railroad or a group of railroads and provides safety oversight of the respective railroad system(s). SMTs applicable to the Bay Area include SMT-3, and SMT-5 through SMT-9. SMT-3 is assigned to Norfolk Southern (a freight transportation network that serves the United States, including Bay Area) SMT-5 is assigned to BNSF Railway (a railroad company that operates one of the largest freight railroad networks in North America), SMT-6 is assigned to Union Pacific Railroad (a railroad company that serves the United States). SMT-7 and SMT-8 are assigned to commuter and excursion railroads and short line railroads in the western section of the Nation, respectively. SMT-9 is assigned to CSX Transportation (a rail-based freight transportation company) (FRA 2024b).

International Fire Code

The International Fire Code (IFC), created by the International Code Council, is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The IFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The IFC and the International Building Code use a hazard classification system to determine what protective measures are required for fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the IFC employs a permit system based on hazard classification. The IFC is updated every 3 years and is the basis for the California Fire

Code (CFC) (also updated triennially). Local jurisdictions, including Bay Area cities and counties, then adopt the CFC, in some cases with local amendments.

National Fire Plan

The US Department of the Interior's National Fire Plan is intended to ensure an appropriate federal response to severe wildland fires, reduce fire impacts on rural communities, and ensure sufficient firefighting capacity in the future. The Rural Fire Assistance program is funded to enhance the fire protection capabilities of rural fire districts and safe and effective fire suppression in the wildland/urban interface. The program promotes close coordination among local, State, tribal, and federal firefighting resources by conducting training, equipment purchase, and prevention activities on a cost-shared basis.

Federal Disaster Mitigation Act

The Disaster Mitigation Act of 2000 provided a set of mitigation plan requirements that encourage state and local jurisdictions to coordinate disaster mitigation planning and implementation. States are encouraged to complete a "Standard" or an "Enhanced" Natural Mitigation Plan. "Enhanced" plans demonstrate increased coordination of mitigation activities at the state level and, if completed and approved, increase the amount of funding through the Hazard Mitigation Grant Program.

STATE REGULATIONS

California Fire Code

The CFC is Chapter 9 of CCR Title 24. It is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The CFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The CFC and the California Building Code use a hazard classification system to determine what protective measures are required for fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the CFC employs a permit system based on hazard classification. The CFC is updated every 3 years.

CFC Chapter 49 provides minimum standards to increase building resistance to the intrusion of flame or burning embers projected by a vegetation fire and identifies performance and prescriptive requirements. Section 4906 provides hazardous vegetation fuel management requirements for buildings and structures located on land in a Very High FHSZ in LRAs and land in a Moderate FHSZ, High FHSZ, or Very High FHSZ in SRAs. Provisions from Chapter 49 will apply to High FHSZ in LRAs beginning in 2026.

CAL FIRE Strategic Plan 2024

The Strategic Plan 2024 is the new 5-year strategic plan for CAL FIRE prepared by CAL FIRE and the California Natural Resources Agency. The plan is built upon the goals and objectives of the 2019 Strategic Plan and establishes a forward-looking and employee-centered framework for the next five years. The plan lays out goals for identifying operational opportunities, key issues, and summarizing future strategies that will drive improvement.

In addition to the Strategic Plan 2024, individual CAL FIRE units develop fire plans, which are major strategic documents that establish a set of tools for each CAL FIRE unit for its local area. Updated annually, unit fire plans identify wildfire protection areas, initial attack success, assets and infrastructure at risk, prefire management strategies, and accountability within their unit's geographical boundaries. The unit fire plan identifies strategic areas for prefire planning and fuel treatment as defined by the people who live and work locally. The plans include contributions from local collaborators and stakeholders and are aligned with other plans for the area.

California Unified Program Administration

The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs, as listed below:

- Hazardous Materials Release Response Plans and Inventories (Business Plans),
- CalARP,
- Underground Storage Tank Program,
- Aboveground Petroleum Storage Act Program,
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs, and
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements.

The state agency partners involved in the Unified Program have the responsibility of setting program element standards, working with CalEPA on program consistency, and providing technical assistance to the Certified Uniform Program Agencies (CUPAs). The following state agencies are involved with the Unified Program:

- **California Environmental Protection Agency.** The Secretary of CalEPA is directly responsible for coordinating the administration of the Unified Program. The Secretary certifies Unified Program agencies.
- **California Department of Toxic Substances Control.** DTSC provides technical assistance and evaluation for the hazardous waste generator program, including on-site treatment (tiered permitting). Under CCR Title 22 and the California Hazardous Waste Control Law, Chapter 6.5, DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste.
- **Governor's Office of Emergency Services.** OES is responsible for providing technical assistance and evaluation of the Hazardous Material Release Response Plan (Business Plan) Program and the CalARP programs.
- **Office of the State Fire Marshal.** The Office of the State Fire Marshal is responsible for ensuring the implementation of the Hazardous Material Management Plans and the Hazardous Material Inventory Statement Programs. These programs tie in closely with the Business Plan Program.
- **State Water Resources Control Board.** SWRCB provides technical assistance and evaluation for the underground storage tank program in addition to handling the oversight and enforcement for the aboveground storage tank program.

Both RCRA and the Hazardous Waste Control Law impose "cradle to grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment. CalEPA has delegated some of its authority under the Hazardous Waste Control Law to county health departments and other CUPAs. Specific CUPAs in the Bay Area are identified in **Table 3.9-3**.

Table 3.9-3: Bay Area CUPAs

County	CUPA(s)
Alameda	Alameda County Environmental Health Berkeley City Toxics Management Department Fremont City Fire Department Hayward City Fire Department Livermore-Pleasanton Fire Department City of San Leandro Union City Environmental Programs
Contra Costa	Contra Costa Health Services Department
Marin	Marin County Department of Public Works
Napa	Napa County Environmental Health – CUPA Planning, Building & Environmental Services Department
San Francisco	San Francisco City & County Public Health Department
San Mateo	San Mateo County Environmental Health
Santa Clara	Gilroy City Fire Department Santa Clara City Fire Department Santa Clara County Environmental Health Sunnyvale Department of Public Safety
Solano	Solano County Environmental Health
Sonoma	Healdsburg/Sebastopol Joint Powers Authority Petaluma City Fire Department Santa Rosa City Fire Department Sonoma County Fire Prevention and Hazmat

Source: CalEPA 2024.

Title 26 of the California Code of Regulations

In California, transportation of hazardous materials and wastes is regulated by Caltrans (26 CCR). CHP and Caltrans enforce both federal and State regulations and respond with the county fire department to hazardous materials transportation emergencies. Emergency responses are coordinated as necessary between federal, State, and local governmental authorities and private persons through the State-mandated Emergency Response Plan.

Worker and Workplace Hazardous Materials Safety

Cal OSHA is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. California standards for workers dealing with hazardous materials are contained in Title 8 of the CCR and include practices for all industries (General Industrial Safety Orders), and specific practices for construction and other industries. Workers at hazardous waste sites (or working with hazardous wastes as might be encountered during excavation of contaminated soil) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos. Cal OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices. Among other requirements, Cal OSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Hazard Communication Standard requires that workers be informed of the hazards associated with the materials they handle. For example, manufacturers are to appropriately label containers, material safety data sheets are to be available in the workplace, and employers are to properly train workers.

California Human Health Screening Levels

The California Human Health Screening Levels (CHHSLs) were developed as a tool to assist in the evaluation of contaminated sites for potential adverse threats to human health. Preparation of the CHHSLS was required by the California Land Environmental Restoration and Reuse Act of 2001. The CHHSLs were developed by OEHHA, an agency under the umbrella of CalEPA, and are contained in its report entitled *Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil* (OEHHA and CalEPA 2005). The thresholds of concern used to develop the CHHSLs are an excess lifetime cancer risk of one in 1 million and a hazard quotient of 1.0 for noncancer health effects. The CHHSLs were developed using standard exposure assumptions and chemical toxicity values published by EPA and CalEPA. The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals to soils have occurred. Under most circumstances, the presence of a chemical in soil, soil gas, or indoor air at concentrations below the corresponding CHHSLs can be assumed to not pose a significant health risk to people who may live (residential CHHSLs) or work (commercial/ industrial CHHSLs) at the site.

California Accidental Release Prevention Program

CalARP addresses facilities that contain specified hazardous materials, known as "regulated substances," that, if involved in an accidental release, could result in adverse off-site consequences. CalARP defines regulated substances as chemicals that pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive.

California Health and Safety Code

The Hazardous Waste Control Act of 1972 (Health and Safety Code Section 25100 et seq.) is the seminal hazardous waste control law in California. It establishes standards for regulating the generation, handling, processing, storage, transportation, and disposal of hazardous wastes. The hazardous waste control program is administered by DTSC and local CUPAs.

Asbestos Regulations

In 1990, CARB issued an Airborne Toxic Control Measure (ATCM), which prohibited the use of serpentine aggregate for surfacing if the asbestos content was 5% or more. In July 2000, CARB adopted amendments to the existing ATCM prohibiting the use or application of serpentine, serpentine-bearing materials, and asbestos-containing ultramafic rock for covering unpaved surfaces unless it has been tested using an approved asbestos bulk test method and determined to have an asbestos content that is less than 0.25%. In July 2001, CARB adopted a new ATCM for construction, grading, quarrying, and surface mining operations in areas with serpentine or ultramafic rocks. These regulations are codified in Title 17, Section 93105 of the CCR. The regulations require preparation and implementation of an Asbestos Dust Mitigation Plan for construction or grading activities on sites greater than 1 acre in size with known NOA soils. The air districts enforce this regulation.

In October 2000, the Governor's Office of Planning and Research issued a memorandum providing guidance to lead agencies in analyzing the impacts of NOA on the environment through the CEQA review process. In November 2000, the California Department of Real Estate added a section to subdivision forms that includes questions related to NOA on property proposed for development. In 2004, as part of its school-site review program, DTSC's School Property Evaluation and Cleanup Division released interim guidance on evaluating NOA at school sites.

In addition, California Health and Safety Code Section 19827.5 prohibits issuance of demolition permits by local and state agencies without assessment of the potential for the structure to contain asbestos.

California Environmental Quality Act

Pursuant to PRC Section 21098, lead agencies must provide notice to the military service for certain projects with specified proximity to a low-level flight path, military impact zone, or special use airspace. Similarly, Government Code Section 65352 requires that, prior to taking certain actions, the lead agency shall refer the proposed action to the appropriate branch of the US military if a project would be:

- located within 1,000 feet of a military installation,
- located beneath a low-level flight path, or
- within special use airspace as defined in CEQA Section 21098.

Pursuant to PRC Section 21151.4, projects that can be reasonably anticipated to produce hazardous air emissions or handle extremely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school must consult with the potentially affected school district and provide written notification not less than 30 days prior to the proposed certification or approval of an environmental document. Where a school district proposes property acquisition or the construction of a school, the environmental document must address existing environmental hazards, and written findings must be prepared regarding existing pollutant sources (see PRC Section 21151.8; Appendix G of the State CEQA Guidelines). PRC Section 21151.2 requires school districts to notify the applicable planning commission before acquiring property for a new school or expansion to identify potential land use conflicts.

On March 1, 2025, Governor Newsom issued a Proclamation of a State of Emergency to expedite critical fuels reduction projects in California, which suspends State statutes, rules, regulations, and requirements under the jurisdiction of the California Natural Resources Agency and California Environmental Protection Agency. The suspension includes but is not limited to CEQA and the California Coastal Act. The suspension serves the purpose of accelerating critical fuels reduction projects, while at the same time protecting public health and the environment.

California Education Code

Sections 17071.13, 17072.13, 17210, 17210.1, 17213.1-3, and 17268 of the California Education Code became effective January 1, 2000. Together, they establish requirements for assessments and approvals regarding toxic and hazardous materials that school districts must follow before receiving final site approval from the California Department of Education and funds under the School Facilities Program. These requirements are consistent with those described above for certification or approval of an environmental document under CEQA.

For example, the site approval package must include written determinations regarding the presence of hazardous wastes or pipelines carrying hazardous substances on the site (the adopted CEQA document is often used for these purposes). The code also requires that a Phase I ESA is conducted according to the American Society of Testing and Materials standards (ASTM E-1527-2000) and transmitted to DTSC. If the Phase I ESA concludes that further investigation is needed or DTSC requires it, a PEA must be completed under DTSC oversight and review. See the discussion above, under "Potential Presence of Hazardous Materials in Soil and Groundwater," for additional information regarding Phase I ESAs and PEAs.

Hazardous Air Emissions and Facilities within a Quarter Mile of a School

When evaluating potential school sites, Education Code Section 17213(b) and PRC Section 21151.8(a)(2) require the local educational agency (LEA) to consult with the applicable air district to identify facilities within 0.25 mile of a proposed school site that might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials, substances, or wastes. The LEA must prepare written findings that either there are no such facilities, the facilities do not pose a health risk, or corrective measures will be taken. In the final instance, the LEA should make an additional finding that emissions will be mitigated before occupancy of the school. These written findings, as adopted by the LEA governing board, must be

submitted to the California Department of Education as a part of the site approval package. Often this information is included in the Phase I ESA and in the adopted CEQA document.

Safety Hazards within Two Miles of an Airport

The Caltrans Division of Aeronautics is also required to review proposals for acquisition of a school site by school districts that are situated within two miles of an existing or planned airport runway (Education Code Sections 17215 and 81033).

California State Aeronautics Act of 1951

At the state level, the California Department of Transportation (Caltrans) Division of Aeronautics administers FAA regulations (Stats. 1951, Ch. 764; PUC Section 21001 et seq.). The division issues permits for hospital heliports and public-use airports, reviews potential and future school sites proposed within 2 miles of an airport, and authorizes helicopter landing sites at or near schools. In addition, the Division of Aeronautics administers noise regulation and land use planning laws, which regulate the operational activities and provides for the integration of aviation planning on a regional basis.

FAA regulations outline the statutory requirements for ALUCPs, including referencing the Division of Aeronautics ALUP Handbook. The California ALUP Handbook was most recently updated in 2011. Lead agencies utilize the ALUP Handbook as a technical resource with respect to airport noise and safety compatibility issues. The California ALUP Handbook provides examples of safety zones for five types of general aviation runways, an air carrier runway, and a military runway. The shapes and sizes of the zones are largely based on the spatial distribution of potential aircraft accidents. The handbook provides a qualitative description of the land use characteristics considered acceptable or unacceptable within each of the basic safety zones.

Title 14 Division 1.5 of the California Code of Regulations

CCR Title 14 Division 1.5 establishes the regulations for CAL FIRE and is applicable in all SRAs and Very High FHSZ in LRAs. These regulations constitute the basic wildland fire protection standards of CAL FIRE. They have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction, and development in SRAs. Among other things, Title 14 establishes minimum standards for emergency access, fuel modification, setback to property line, signage, and water supply.

Specifically, Article 2, “Emergency Access and Egress,” requires provision of safe access for emergency wildfire equipment and civilian evacuation concurrently and unobstructed traffic circulation during a wildfire emergency. To accomplish this, all roads must provide a minimum of two 10-foot traffic lanes that provide for two-way traffic flow to support emergency vehicle and civilian egress, unless other standards are provided in this article, or additional requirements are mandated by local jurisdictions or local subdivision requirements. All one-way roads must be constructed to provide a minimum of one 12-foot traffic lane. All one-way roads shall connect to a road with two traffic lanes at both ends, and shall provide access to an area currently zoned for no more than ten residential units. In addition, roads cannot have a horizontal inside radius of curvature of less than 50 feet. Turnarounds are required on driveways and dead-end roads.

Government Code Section 65962.5

Government Code Section 65962.5 is commonly referred to as the “Cortese List” (after the legislator who authored the legislation that enacted it). The list, or a site's presence on the list, has bearing on the local permitting process, as well as on compliance with CEQA. However, because this statute was enacted over 20 years ago, some of the provisions refer to agency activities that are no longer being implemented and, in some cases, the information to be included in the Cortese List does not exist. While Government Code Section 65962.5 makes reference to the preparation of a “list,” many changes have occurred related to

web-based information access since 1992, and this information is now largely available on the Internet sites of the responsible organizations. A centralized list is no longer compiled, and those requesting a copy of the Cortese "list" are now referred directly to the appropriate information resources contained on the Internet sites of the boards or departments that are referenced in the statute.

California Emergency Services Act

The California Emergency Services Act of 2008 merged the duties, powers, purposes, and responsibilities of OES and the Governor's Office of Homeland Security into a new cabinet-level agency, the California Emergency Management Agency (Cal EMA). In 2013, Governor Edmund G. Brown Jr. merged the California Emergency Management Agency with the Office of Public Safety Communications and renamed the organization the California Governor's Office of Emergency Services (Cal OES). CAL OES is responsible for overseeing and coordinating emergency preparedness, response, recovery, and homeland security activities within California. Section 8687.7 of the California Disaster Assistance Act required the development of a Standard Emergency Management System (SEMS) program, for managing multiagency and multijurisdictional responses to emergencies in California. The Cal OES Emergency Management Systems Unit is a multi-agency group charged with methodical review, evaluation, and approval of needed improvements to SEMS. State agencies are required to use SEMS and local government entities must use SEMS in order to be eligible for any reimbursement of response-related costs under the state's disaster assistance programs.

Cal OES serves as the lead state agency for emergency management and coordinates the state response to major emergencies in support of local government. SEMS provides the mechanism by which local governments request assistance from Cal OES, and Cal OES maintains oversight of the state's mutual aid system.

State of California Emergency Plan

The Cal OES Emergency Plan outlines a state-level strategy to support local government efforts during a large-scale emergency. In accordance with the California Emergency Services Act, the state Emergency Plan describes methods for carrying out emergency operations, mutual aid processes, emergency services of governmental agencies, resource mobilization, emergency public information, and continuity of government.

California Multi-Hazard Mitigation Plan

The State Hazard Mitigation Plan (SHMP) represents the State's primary hazard mitigation guidance document - providing an updated analysis of the State's historical and current hazards, hazard mitigation goals and objectives, and hazard mitigation strategies and actions. The plan represents the State's overall commitment to supporting a comprehensive mitigation strategy to reduce or eliminate potential risks and impacts of disasters in order to promote faster recovery after disasters and, overall, a more resilient state. State Hazard Mitigation Plans are required to meet the Elements outlined in FEMA's State Mitigation Plan Review Guide (revised March 2015, effective March 2016). OES is responsible for the development and maintenance of the state's plan for hazard mitigation. The 2023 SHMP is the current plan that will expire on August 29, 2028. The 2023 SHMP was also approved by the Federal Emergency Management Agency (FEMA) as an Enhanced State Mitigation Plan. The plan is designed to reduce the effects of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards. The SHMP sets the mitigation priorities, strategies, and actions for the State. The plan also describes how risk assessment and mitigation strategy information is coordinated and linked from local mitigation plans into the SHMP, and provides a resource for local planners of risk information that may affect their planning area. The State of California is required to review and revise its mitigation plan and resubmit for FEMA approval at least every 5 years to ensure continued funding eligibility for certain federal grant programs.

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act

The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 granted the Office of Spill Prevention and Response (OSPR) the authority to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in marine waters of California. OSPR implements the California Oil Spill Contingency Plan, consistent with the National Contingency Plan, which pays special attention to marine oil spills and impacts to environmentally and ecologically sensitive areas. In 2014, the OSPR program was expanded to cover all statewide surface waters at risk of oil spills from any source, including pipelines and the increasing shipments of oil transported by railroads.

California Public Utilities Code Sections 309.7

The California Public Utilities Commission (CPUC) is the state regulatory agency with legal authority for rail safety within California. The Railroad Operations and Safety Branch is responsible for enforcing state and federal laws, regulations, general orders, and directives relating to the transportation of persons and commodities by rail. Several California Public Utilities Code sections prescribe CPUC responsibilities. In particular, under Section 309.7, CPUC is responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads. Public Utilities Code Sections 309.7 and 765.5(d) require CPUC to employ a sufficient number of federally certified inspectors to ensure that all main and branch line tracks are inspected at least every 12 months.

Local Community Rail Security Act

The Local Community Rail Security Act of 2006 (Public Utilities Code Sections 7665–7667) requires all rail operators to provide security risk assessments to CPUC, the director of Homeland Security, and the Catastrophic Event Memorandum Account that describe:

- location and function of each rail facility,
- types of cargo stored at or typically moved through the facility,
- hazardous cargo stored at or moved through the facility,
- frequency of hazardous movements or storage,
- a description of sabotage-terrorism countermeasures,
- employee training programs,
- emergency response procedures, and
- emergency response communication protocols.

California Department of Transportation Emergency Response

Caltrans is the owner and operator of the State highway system. Its emergency response priorities include damage assessment and route recovery on State highways. Caltrans' District 4 office is responsible for State roadways and bridges (with the exception of the Golden Gate Bridge) in its nine-county jurisdiction in the San Francisco Bay Area. During an emergency, Caltrans activates its Emergency Operations Center, which collects information and defines priorities for responding to the emergency. District 4 also operates the region's Transportation Management Center in its Oakland office, in partnership with the California Highway Patrol.

REGIONAL AND LOCAL REGULATIONS

Bay Area Air Quality Management District Asbestos Regulations

Asbestos is a naturally occurring mineral often used in building materials and construction. Because asbestos has been proven to cause serious and fatal diseases, it is strictly regulated in its use as a building material and where it occurs naturally.

Asbestos Demolition and Renovation Program

The Bay Area Air District (formerly called the Bay Area Air Quality Management District [BAAQMD]) regulates the demolition and renovation of buildings and structures that may contain asbestos, and the manufacture of materials known to contain asbestos. The Bay Area Air District must be notified at least 10 business days before and demolition project or any renovation involving the removal of 100 square. feet or more, 100 linear feet or more, or 35 cubic feet or more of asbestos.

Naturally Occurring Asbestos Program

To reduce public exposure to NOA, the Bay Area Air District regulates all construction and mining activities that produce dust potentially containing naturally occurring asbestos. The Airborne Toxic Control Measure places requirements on the following activities in areas where NOA is likely to be found:

- road construction and maintenance,
- construction and grading, and
- Quarrying and surface mining.

San Francisco Bay Area Regional Emergency Coordination Plan

The Bay Area Regional Emergency Coordination Plan (RECP) was prepared by OES, the nine Bay Area counties (as well as Santa Cruz County), and the cities of Oakland and San Jose to provide a framework for collaboration and coordination during regional events. The RECP defines procedures for regional coordination, collaboration, decision making, and resource sharing among emergency response agencies in the Bay Area. The RECP provides critical linkages to ensure that existing Bay Area emergency response systems work together effectively during the response to an event. In addition, the RECP complies with the requirements of the National Incident Management System and is consistent with the National Preparedness Goal.

San Francisco Bay Area Regional Transportation Emergency Management Plan

MTC's 2018 *San Francisco Bay Area Regional Transportation Emergency Management* (RTEMP) establishes a baseline-operating plan adaptable to a range of emergency recovery scenarios. It reflects existing emergency operating procedures from the regional transportation agencies; and attempts to reconcile conflicts, inconsistencies and gaps among these existing plans. The purpose of the RTEMP is to improve the ability of Bay Area public transportation agencies to recover operations and deliver basic transportation services after a significant regional disaster. The RTEMP provides guidance to MTC, Caltrans, the California Highway Patrol, the San Francisco Bay Area Water Emergency Transportation Authority and the largest Bay Area transit operators for coordinating response and recovery efforts and allocating assets to restore basic regional mobility.

The RTEMP is intended to facilitate the response and recovery of Bay Area transportation agencies in the event of an emergency by enabling them to: assess the condition, safety and operability of Bay Area transportation systems in the immediate aftermath of an emergency; identify needs for emergency transportation services and coordinate responses with Cal OES, prioritize emergency response services above basic transportation services; provide basic transportation services as quickly and completely as possible; facilitate requests for mutual aid from transportation agencies affected by an emergency; and identify and secure assets from other transportation entities or from outside the Bay Area to enable the provision of relief transportation services during response and recovery.

The RTEMP is a counterpart to the RECP developed by OES to coordinate all-hazards emergency response.

Trans Response Plan

MTC developed and maintains the Trans Response Plan to coordinate basic transportation services in the event of major emergencies. During such incidents, the Trans Response Plan provides the means of informing responding agencies and the general public about the changing transportation situation and facilitates the coordination of a transportation response to an emergency. The Trans Response Plan defines MTC's functions during an emergency as the regional transportation information clearinghouse for collecting, summarizing and disseminating information about transportation assets, services and capabilities, and dissemination of information about the availability of regional transportation services to the media and public.

City and County General Plans

Local planning policies related to hazards and hazardous materials are established in each jurisdiction's general plan, generally in the safety element or equivalent chapter. Safety elements are required to address geologic hazards, fire hazards, dam failure, evacuation routes, flooding, and emergency response, among other issues. For emergency services, relevant policies may include coordinating with other agencies that are responsible for planning medical facilities to meet the health care needs of residents in the region, retaining hospitals, evaluating medical facility proposals, providing emergency response services, and participating in mutual-aid agreements.

As of January 1, 2014, Senate Bill 1241 requires that, upon the next revision of the housing element, jurisdictions review and update the safety element as necessary to address the risk of fire in SRAs and Very High FHSZs. These revisions must take into account specified considerations, including the provisions outlined in "Fire Hazard Planning" by the Governor's Office of Planning and Research.

Senate Bill 1425 was approved on September 30, 2022, which requires each city and county to review and update its local open space plan by January 1, 2026. The open space plan update should include plans and an action program to address specified issues, including climate resilience and other co-benefits of open space, correlated with the safety element. This bill would create a State-mandated local program by imposing additional duties on local officials.

Airport Land Use Commissions and Airport Land Use Compatibility Plans

An ALUC is an agency that is required by state law in counties where there is an airport operated for the benefit of the general public. The purpose of the ALUC is to protect public health, safety, and welfare by ensuring the orderly development of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses. The ALUC is responsible for developing and maintaining ALUCPs for areas around each airport. A list of the ALUCs in the plan area is provided in **Table 3.9-4.**

ALUCs may request that all or selected land use actions (e.g., general plan, specific plan, zoning ordinance, building regulation, land acquisition, annexation, large development project) within an airport influence area (AIA) be submitted for review for consistency with the ALUCP. An AIA is the area in which current or future airport-related noise, overflight, safety, and/or airspace protection factors may affect land uses or necessitate restrictions on those uses. The ALUC establishes its jurisdictional authority by designating one or more AIAs. If the ALUC has not designated an AIA, then a boundary 2 miles from a public airport is used (Public Utilities Code Section 21675.1[b]). City and county zoning and planning are required to conform to the ALUCP unless the city or county governing body specifically overrides the ALUCP by supermajority vote.

Table 3.9-4: Airport Land Use Commissions and Adopted Airport Land Use Compatibility Plans in the Plan Area

County	Airport Land Use Commission	Airport Land Use Compatibility Plans (year adopted)
Alameda	Alameda County ALUC	Oakland International Airport: Airport Land Use Compatibility Plan (2010) Hayward Executive Airport: Airport Land Use Compatibility Plan (2012) Livermore Executive Airport: Airport Land Use Compatibility Plan (2012)
Contra Costa	Contra Costa County ALUC	Contra Costa County Airport Land Use Compatibility Plan (2000)
Marin	Marin County ALUC	Marin County Airport Lad Use Compatibility Plan: Gnoss Field (1991, currently being updated)
Napa	Napa County ALUC	Napa County Airport Land Use Compatibility Plan (1991, currently being updated)
San Francisco	No airport	Not applicable
San Mateo	City/County Association of Governments Board acting as the ALUC for the San Mateo County	Comprehensive Airport Land Use Compatibility Plan for the Environs of San Carlos Airport (2015, last amended 2022) Airport Land Use Compatibility Plan for the Environs of Half Moon Bay (2014) Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport (2012)
Santa Clara	Santa Clara County ALUC	Airport Land Use Compatibility Plans Santa Clara County: San Jose Mineta International Airport (2024) Comprehensive Land Use Plan Santa Clara County: Reid-Hillview Airport (2007, last amended 2020) Comprehensive Land Use Plan Santa Clara County: Moffett Federal Airfield (2012, last amended 2018) Comprehensive Land Use Plan Santa Clara County: Palo Alto Airport (2008, last amended 2020) Comprehensive Land Use Plan Santa Clara County: San Martin Airport (2008, last amended 2020)
Solano	Solano County ALUC	Travis Air Force Base Land Use Compatibility Plan (2024) Rio Vista Airport: Airport Land Use Compatibility Plan (2024) Nut Tree Airport: Airport/Land Use Compatibility Plan (1988)
Sonoma	Sonoma County ALUC	Comprehensive Airport Land Use Plan for Sonoma County (2001)

Sources: Alameda County 2024; Santa Clara County 2024; Solano County 2024a; Sonoma County 2024; City/County Association of Governments of San Mateo County 2024; Contra Costa County 2024a; Marin County 2024; Napa County 2024.

3.9.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Criterion HAZ-1);

- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (Criterion HAZ-2);
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school (Criterion HAZ-3);
- be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment (Criterion HAZ-4);
- result in a safety hazard for people residing or working in the planning area for projects located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport (Criterion HAZ-5);
- impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan, including for projects located in or near State Responsibility Areas or lands classified as very high hazard severity zones (Criterion HAZ-6); or
- exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides due to projected land use patterns and infrastructure in or near State Responsibility Areas or land classified as very high hazard severity zones (Criterion WF-7).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts related to hazards, hazardous materials and wildfire, based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of naturally occurring hazardous materials, airports, and fire hazards zones throughout the Bay Area.

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county).

The following evaluation is based on a review of documents and publicly available information about hazardous and potentially hazardous conditions in the plan area to determine the potential for project implementation to result in an increased health or safety hazard to people or the environment. This includes city and county planning documents, and SWRCB, CalEPA/EPA, and DTSC hazardous materials database information. The baseline for the following analysis is the date of Notice of Preparation release in January of 2025. Due to the large area covered by the proposed plan, known sites of current or former contamination were not evaluated in detail, and physical surveys were not conducted. Rather, this programmatic analysis is based on hazards typically associated with certain land uses and an overall understanding of the key safety concerns that could result from implementation of the proposed plan.

For select hazards impact assessments (i.e., presence or potential for NOA and wildland fire hazards), a geographic information system (GIS) was used to digitally overlay the proposed plan's footprints associated with forecasted land use development, sea level rise adaptation projects, and transportation projects onto resource data related to NOA, airports, and fire hazards zones. The land use growth footprint is derived from the UrbanSim 2.0 land use model and simulates development or redevelopment at the parcel level. Precise building site(s) on the parcels are not known, therefore the land use growth footprint incorporates the entire parcel. Where parcels are large and only partially within hazard areas, potential for development to occur in hazard zones may be reported where growth would actually occur on another portion of the parcel. Because of this assumption, the area of potential effects could be overstated or appear to accommodate future growth in high or very high fire hazard zones. See Section 3.1, "Approach

to the Analysis," for additional details on the calculations for the land use growth, sea level rise adaptation projects, and transportation projects.

The evaluation of hazards and hazardous materials impacts assumes that the construction and development under the proposed plan would adhere to the applicable federal, state, and local regulations, and conform to appropriate standards in the industry, as relevant for individual projects. As explained in Section 3.1, "Approach to the Analysis," of this Draft EIR, where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume they would be implemented, thereby reducing impacts.

IMPACTS AND MITIGATION MEASURES

Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (LTS)

Land Use and Sea Level Rise Adaptation Impacts

Construction and Operation

Implementation of the proposed plan would result in the development of a variety of land uses and the sea level rise adaptation projects that address regularly inundated shoreline areas with a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Development activities associated with implementation of the proposed plan would temporarily increase the regional transport, use, storage, and disposal of hazardous materials and petroleum products commonly used in construction (e.g., diesel fuel, lubricants, paints and solvents, and cement products containing strong basic or acidic chemicals). In the longer term, development would be generally associated with sustained, expanded use of household hazardous materials (e.g., paints, cleaning supplies, solvents, and petroleum products). Many specific land uses (e.g., dry cleaners, gas stations, and certain industrial uses) could also involve routine transport, use, and disposal of certain hazardous materials and wastes unique to the land use. As explained further below, these activities are subject to a suite of established regulations that address the potential for impacts from the routine transport, use, and disposal use of potentially hazardous materials.

Trucks transporting hazardous materials use many of the same freeways, arterials, and local streets as other traffic. This creates a risk of accidents and associated release of hazardous materials for other drivers and for people along these routes. **Figure 3.9-1** maps the hazardous materials routes established by DOT in the plan area. Although the transportation of hazardous materials could result in accidental spills, leaks, toxic releases, fire, or explosion, the DOT Office of Hazardous Materials Safety prescribes strict regulations for the safe transportation of hazardous materials, as described in Title 49 of the CFR. These standard accident and hazardous materials recovery training and procedures are enforced by the state and followed by private state-licensed, -certified, and -bonded transportation companies and contractors. Caltrans and other state agencies impose regulation through the Hazardous Waste Control Act (HSC Section 25100 et seq.), which regulates the identification, generation, transportation, storage, and disposal of materials deemed hazardous by the State of California.

In California, any person who transports hazardous waste in a vehicle must have a valid registration issued by DTSC. The California Highway Patrol enforces hazardous material and hazardous waste labeling and packing regulations. These regulations prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an accident.

As noted above, FRA and PHMSA closely regulate the rail transport of crude oil and other hazardous materials. The transport of hazardous materials by rail is subject to requirements for handling, loading, and unloading, and the placement of placards to alert emergency response teams as to the contents of each car. FRA routinely inspects the facilities of shippers and railroads to ensure that all regulatory

requirements are met. These regulations minimize the potential for accidental releases during transport of hazardous materials and wastes.

Rupture of train cars carrying crude oil is a safety hazard because the spilled material could explode if exposed to an ignition source. Future development associated with the proposed plan would include development in existing urban locations and near existing rail infrastructure and would most likely add people to the initial evacuation zone adjacent to operating rail lines. Standard safety procedures would result in evacuation of these individuals immediately following derailment of a railcar carrying flammable liquid or gas, while standard response to release of other potentially hazardous materials (e.g., organophosphates, fertilizers) is to shelter in place. Contemporary building standards require construction of residences that are sufficiently contained (e.g., with doors and windows that seal) to allow sheltering in place to occur without substantial potential for harm to residents. For a discussion of the impacts on emergency services response times and service ratios, see also Section 3.13, "Public Services and Recreation." Regulations are in place through which the railroads would address the potential hazards associated with unauthorized use or pedestrian crossing of the track, any changes to volume of train transport that may indirectly result from the plan, and any necessary changes to the speed of travel on segments of track adjacent to areas where changes in land use occur.

Implementation of the proposed plan could result in increased urbanization along other transportation corridors. Construction and operation of land use projects adjacent to new roadway segments and public transit infrastructure, including in Growth Geographies that encourage development near this infrastructure, would not increase the hazard associated with operation of highways and railroads but could increase the number of people potentially exposed to hazardous conditions. To be declared a sustainable communities project under PRC Section 21155.1, projects must demonstrate that there would not be an "unusually high" risk of fire or explosion from materials stored or used on or near the property and the project would not result in a risk of exposure to a potentially hazardous material at levels that exceed State and federal standards.

The Cal EMA administers the Emergency Response Plan to respond to hazardous materials incidents that may occur. CalARP, established by EPA, applies to a wide variety of facilities that contain regulated substances and aims to prevent accidental releases of hazardous materials into the environment through adoption of proper storing, containing, and handling procedures. Implementation of federal, state, and local requirements, such as CalARP, RECP, DOT, and DTSC regulations, would minimize potential exposure to the public and the environment from accidental releases.

During construction of land use and sea level rise adaptation projects, all hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations and in compliance with federal, state, and local regulations. Small fuel or oil spills would have a negligible impact on public health due to the properties of these materials and because they would be discrete, localized releases. Spills would be resolved in accordance with applicable regulations so that there would not be long-term exposure or potential for contaminant migration. Hazardous materials spills or releases, including petroleum products, such as gasoline, diesel, and hydraulic fluid, regardless of quantity spilled, must be immediately reported if the spill has entered or threatens to enter a water of the state, including a stream, lake, wetland, or storm drain, or has caused injury to a person or threatens injury to public health. Immediate notification must be made to the local emergency response agency, or 911, and the Governor's Office of Emergency Services Warning Center. For nonpetroleum products, additional reporting may be required if the release exceeds federal reportable quantity thresholds over a release period of 24 hours as detailed in HSC Section 25359.4 and Title 40, Section 302.4 of the CFR.

Pursuant to Occupational Safety and Health Administration regulations (29 CFR Section 1910.120), standard accident training for cleaning small spills would be provided to all individuals prior to their work with hazardous substances, and the appropriate types and amounts of spill cleanup materials and

personal protective equipment would be immediately available. Additional requirements regarding hazardous materials labeling, containment, and covering set forth by the SWRCB Construction General Permit (2009-009-DWQ) would also be implemented during construction.

During operation, businesses that store hazardous materials could potentially experience accidents or upset conditions that result from their routine use. These businesses are required to prepare spill prevention, containment, and countermeasures plans (pursuant to 40 CFR 112) or, for smaller quantities, spill prevention and response plans, that identify best management practices for spill and release prevention and provide procedures and responsibilities for rapidly, effectively, and safely cleaning and disposing of any spills or releases. Oversight is provided by the CUPA. As discussed above, the severity of potential effects varies with the activity conducted and the concentration and type of hazardous materials involved; however, most minor spills would be remediated immediately pursuant to the requirements and liabilities of applicable regulations and would not pose a substantial hazard to the public or the environment. The possible adverse effects on the public or environment from these and other activities would more likely be acute (immediate, or of short-term severity) as a result of short-term exposure. The operation of businesses that use, create, or dispose of hazardous materials is regulated and monitored by federal, state, and local regulations that provide a high level of protection to the public and the environment from the hazardous materials manufactured within, transported to, and disposed of within the region.

The proposed sea level rise adaptation projects would not involve use of hazardous materials during operation. As a result, no increase in the routine transport, use, or disposal of hazardous materials and no associated hazards to the public or the environment is anticipated. Additionally, as a function of protecting critical transportation infrastructure from sea level rise, the adaptation projects could reduce the inherent hazards of transporting hazardous materials that could occur in the future because of sea level rise.

RCRA, Title 22 of the CCR, and the Hazardous Waste Control Law regulate the generation, transport, treatment, storage, and disposal of hazardous waste. These laws impose regulatory systems for handling hazardous waste in a manner that protects human health and the environment, including requirements for the classification of materials, packaging, and hazard communication. CalEPA oversees the regulation and management of hazardous materials on a statewide level through DTSC. Use of hazardous materials requires permits and monitoring to avoid hazardous waste release through the local CUPA. DTSC is responsible for the enforcement and implementation of hazardous waste laws and regulations, codified in Title 22 of the CCR. Additionally, businesses that generate hazardous waste are required to have an EPA identification number to monitor and track hazardous waste activities.

It is assumed that implementation of the proposed plan's forecasted development pattern and sea level rise adaptation projects would comply with RCRA; CCR Title 22; California Hazardous Waste Control Law; Cal/EPA requirements; hazardous materials training requirements; and any local regulations, such as city or county Hazardous Materials Management Plans regulating the generation, transportation, treatment, storage, and disposal of hazardous materials and waste. Because these regulations are law and binding on responsible agencies and project sponsors, it is reasonable to expect they would be implemented. These established regulations address the potential for impacts from the routine transport, use, and disposal use of potentially hazardous materials. Therefore, impacts related to implementation of the proposed plan at the regional and local level would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

Transportation projects in the proposed plan include a variety of transportation modifications, such as adding travel lanes to freeways, expressways, or highways, or expanding fixed guideway transit.

Construction activities associated with implementation of the proposed plan would involve the short-term transport, use and storage of hazardous materials (e.g., asphalt, fuel, lubricants, paint) typical of transportation projects and similar to those identified above for land use projects.

The proposed transportation projects involve the expansion or extension of the transportation system, which may increase the capacity of roadways to transport hazardous materials. Transportation projects that expand the transportation system and extend it to new areas may expose more adjoining land uses to risks associated with upset on the roadway, highway, or railroad. As discussed above, implementation of federal, state, and local requirements, such as CalARP, the RECP, DOT, and Caltrans regulations, would minimize potential exposure to the public and the environment from accidental releases.

The plan also includes transportation investments that would result in improvements to rail crossing safety. Any new or improved rail crossings would be subject to review by the affected railroads. Roadway projects in the proposed plan would also improve road safety, as well as pedestrian and bicycle safety, thereby potentially reducing transportation-related hazardous materials risks because fewer accidents would occur on safer roads. Based on the requirements of 49 CFR Parts 171–180, construction and operation of transportation projects would provide for the safe transport and disposal of hazardous waste. Because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these activities to an acceptable level, impacts related to accident or upset of hazardous materials from anticipated modifications to the transportation system would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could increase the routine transport, use, storage, and disposal of hazardous wastes in the region. As discussed above, all projects would comply with federal, state, and local regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level. Because of the existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these activities, the impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (LTS)

Land Use Impacts

Construction

There are several reasonably foreseeable situations that could result in the release of hazardous materials into the environment. Accidents during transport of potentially hazardous materials used in construction of land uses assumed in the plan, the routine use of hazardous substances, and generation of hazardous waste during construction are discussed in Impact HAZ-1. As discussed above, this routine use is unlikely to result in a substantial hazard to the public or the environment with adherence to established regulations. Other reasonably foreseeable events that could result in exposure to potentially hazardous materials include disturbance of hazardous wastes in soil or groundwater, hazards associated with structure demolition, and grading and construction in areas with NOA. The following discussion focuses on potential hazards associated with grading and demolition activities. The potential for construction to

encounter contaminated soil or groundwater associated with documented or undocumented sites of historical contamination is addressed below in the discussion of Impact HAZ-4.

The land use growth footprint consists of the areas forecasted for redevelopment or new development under the proposed plan. In areas where redevelopment occurs, existing structures could be demolished. Demolition of existing structures could result in exposure of construction personnel and the public to hazardous substances. Construction workers and nearby employees and/or residents could potentially be exposed to airborne lead-based paint dust, asbestos fibers, and/or other contaminants because of demolition activities associated with redevelopment. Demolition of structures could result in inadvertent release or improper disposal of debris containing potentially hazardous materials; however, federal, state, and local regulations have been developed to address potential impacts related to the handling and disposal of hazardous materials during demolition. Potential impacts would be minimized through adherence to regulatory standards that prescribe specific methods of material characterization and handling.

Asbestos and lead abatement must be performed and monitored by contractors with appropriate certifications from the California Department of Public Health. Demolition that could result in the release of lead and/or asbestos must be conducted according to Division of Occupational Safety and Health (Cal/OSHA) standards. Prior to demolition, all structures would be tested for the presence of lead and asbestos-containing materials, in accordance with 15 US Code Section 2601 et seq. and 40 CFR Part 763, Subpart G. Any asbestos would be removed and disposed of by an accredited contractor in compliance with federal, state, and local regulations (including the Toxic Substances Control Act and the National Emission Standard for Hazardous Air Pollutants). For the purposes of compliance with Cal/OSHA regulations, all coated surfaces would be assumed to potentially contain lead. Spent fluorescent light bulbs and ballasts, thermostats, and other electrical equipment may contain heavy metals, such as mercury, or polychlorinated biphenyls. If concentrations of these materials exceed regulatory standards, they would be handled as hazardous waste in accordance with hazardous waste regulations.

In addition, Cal/OSHA has regulations concerning the use of hazardous materials, including requirements for safety training, availability of safety equipment, hazardous materials exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces the hazard communication program regulations, which include provisions for identifying and labeling hazardous materials, describing the hazards of chemicals, and documenting employee-training programs.

Construction related to planned development could also occur in areas where asbestos occurs naturally. As described above, NOA is a carcinogen that is associated with ultramafic rock formations found throughout the plan area. The California Geological Survey has prepared reports on the relative likelihood for the presence of NOA in California. As shown in **Figure 3.9-2**, NOA occurs throughout the plan area, but is most prominent in Napa, Sonoma, and Santa Clara Counties. With the amount and general location of regional growth, implementation of the plan could disturb the NOA in the plan area and release asbestos into the environment.

The acreage of the land use growth footprint that could be located on ultramafic rocks is provided in **Table 3.9-5**. People exposed to low levels of asbestos may be at elevated risk of lung cancer and mesothelioma. Airborne exposure to soil dust containing asbestos can occur under a variety of scenarios, including grading and earth disturbance associated with construction activity, rock blasting, and quarrying. The Asbestos ATCM requires preparation and implementation of an asbestos dust mitigation plan for construction or grading activities on sites greater than 1 acre in size with known NOA soils, as determined through the geotechnical investigations discussed in Section 3.8, “Geology, Seismicity, and Mineral Resources.” The asbestos dust mitigation plan would incorporate the recommendations of the geotechnical investigation to avoid effects on nearby populations. Typical aspects of the mitigation plan would include provisions for sampling soils exported to the project site during construction, prohibition of

rock crushing where materials may contain asbestos, standard track-out control measures, and limits on fugitive dust. In addition, HSC Section 19827.5 requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The impact would be less than significant (LTS).

Table 3.9-5: Acreage of Land Use Growth Footprint within Ultramafic Rock by County

County	Total (acres)
Alameda	80
Contra Costa	4
Marin	4
Napa	0
San Francisco	470
San Mateo	5
Santa Clara	70
Solano	0
Sonoma	< 1
Regional Total	630

Notes: Numbers less than 1 are shown as "<1"; Whole numbers have been rounded (between 0 and 10 to the nearest whole number and between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Sources: USGS 2017; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Operation

If not addressed during construction, operational effects could include prolonged exposure to soil dust containing asbestos from children playing in the dirt, dust raised from unpaved roads and driveways covered with crushed serpentine, gardening, and other activities. However, established regulations prohibit the use of soil with asbestos for surfacing in California. Further, soils containing 1% or more asbestos are considered to be asbestos-containing material and, if disposed of offsite, must be managed as a hazardous waste with transport subject to Caltrans regulations. Compliance with CARB regulations and local policies for control of NOA would reduce the exposure of sensitive receptors during operation.

The proposed plan identifies strategies to accommodate forecasted growth within existing communities. Such development would not create a hazard to the public or the environment due to structure demolition or grading in areas with NOA because these activities would be subject to binding regulations that address the hazards inherent with these activities. The impact would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Site preparation activities associated with the sea level rise adaptation projects could require demolition of structures and roadways that contain asbestos, lead, or other hazardous materials. As explained above, these activities would be subject to regulations that are law and binding on responsible agencies and project sponsors. These regulations would address the potential for significant hazard to the public and the environment due to reasonably foreseeable upset and accident conditions. There are approximately 57 acres of sea level rise adaptation projects that would overlap with ultramafic rock in the City and County of San Francisco. There is no ultramafic rock mapped within the sea level rise adaptation projects footprint in other Bay Area counties. Construction of sea level rise adaptation projects would be subject to existing regulations addressing potential hazards associated with construction on ultramafic soils, as discussed under "Land Use Impacts," above.

During operation, sea level rise adaptation projects would not create a significant hazard to the public because there would be limited soil disturbance and few opportunities for the public to inhale any airborne fibers. Implementation of sea level rise adaptation projects would not be expected to result in the use of hazardous materials during operation, and exposure to hazardous materials would not be reasonably anticipated. Impacts related to implementation of the resiliency projects proposed in the plan would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

The potential for construction of transportation projects to create a hazard to the public and the environment due to reasonably foreseeable upset and accident conditions would be similar to the potential described above for land use impacts in the Growth Geographies. In addition, the same regulatory mechanisms would address the risk.

Approximately 30 acres associated with the transportation projects footprint would be located in areas with ultramafic rock, primarily in San Francisco and Santa Clara County (**Table 3.9-6**). As discussed above, existing regulations address potential hazards associated with construction on ultramafic soils. During operation, improved road and rail systems would not create a significant hazard to the public because there would be limited soil disturbance and few opportunities for the public to inhale any airborne fibers.

Table 3.9-6: Acreage of Transportation Projects Footprint within Ultramafic Rock by County

County	Total (acres)
Alameda	0
Contra Costa	< 1
Marin	0
Napa	0
San Francisco	10
San Mateo	0
Santa Clara	20
Solano	0
Sonoma	0
Regional Total	30

Notes: Whole numbers have been rounded. Numbers less than 1 are shown as "<1"; Whole numbers have been rounded (between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Sources: USGS 2017; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Conclusion

Construction related to the forecasted development pattern, sea level rise adaptation projects, and transportation projects anticipated in the proposed plan would require grading and demolition in areas where existing structures and infrastructure could contain hazardous materials, as well as areas where asbestos is naturally occurring. As described above, existing regulations establish procedures for activities potentially involving these materials that would address the potential for upset and accident conditions and the associated potential for hazard to the public or the environment. The proposed plan would have a **less-than-significant (LTS)** impact because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with these activities to an acceptable level.

Mitigation Measures

None required.

Impact HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school (LTS)

Land Use Impacts

Construction

Construction associated with implementation of the proposed plan would temporarily increase the regional transport, use, storage, and disposal of hazardous materials and petroleum products commonly used in construction (e.g., diesel fuel, lubricants, paints and solvents, and cement products containing strong basic or acidic chemicals). This transport, use, and storage could occur within 0.25 mile of an existing or proposed school. As explained above, construction activities are subject to legally binding regulations that address the potential for impacts from the routine transport, use, storage and disposal of potentially hazardous materials.

For new schools that may be developed to accommodate the forecasted population growth identified in the proposed plan, the California Education Code, including Education Code Section 17213(b), establishes requirements for assessments and approvals that address the potential for existing contamination on the site, and whether nearby land uses might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials. Assessment of existing contamination is conducted in coordination with DTSC's School Property Evaluation and Cleanup Division, which is responsible for assessing, investigating, and cleaning up proposed school sites. This division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy a new school. All proposed school sites that receive state funding for acquisition or construction are required to go through a rigorous environmental review and cleanup process under DTSC's oversight. The impact would be less than significant (LTS).

Operation

The land use growth footprint accommodates the forecasted growth in population, jobs, and housing throughout the region. This growth could result in an increase in hazardous materials use, which in turn increases the potential for accidental release of hazardous materials within 0.25 mile of an existing or proposed school. Further, population growth would result in a corresponding demand for public services, including schools. As noted in **Table 3.13-1** in Section 3.13, "Public Services and Recreation," there were 1,723 public and charter schools in the plan area during the 2022-2023 school year. Children are particularly susceptible to long-term impacts from emissions of hazardous materials, including those from high-volume automobile travel on roadways near schools. The potential effects on sensitive land uses, including schools, associated with potentially hazardous emissions from stationary sources and exposure to air contamination related to roadways is addressed in Section 3.4, "Air Quality."

Any new commercial or industrial operations in proximity to existing schools would be required to comply with regulations related to the routine use, storage, and transport of hazardous materials. As discussed in detail above, compliance with existing regulations would reduce the exposure to potential hazards associated with these land uses. Further, any future projects from buildout of the plan that would generate emissions or involve the handling of extremely hazardous materials, substances, or waste within 0.25 mile of an existing school would be required to notify the affected school district (pursuant to PRC Section 21151.4).

Therefore, impacts related to the use of hazardous materials near schools as a result of land use changes from the buildout of the proposed plan would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Construction of sea level rise adaptation projects would temporarily increase the regional transport, use, storage, and disposal of hazardous materials and petroleum products commonly used in construction (e.g., diesel fuel, lubricants, paints and solvents, and cement products containing strong basic or acidic chemicals). As explained above, the use and transport of potentially hazardous materials for construction would be subject to regulations that are law and binding to responsible agencies and project sponsors. These regulations would address the potential for significant hazard to the public and the environment due to reasonably foreseeable upset and accident conditions. After construction, the sea level rise adaptation projects would not be expected to result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Impacts related to implementation of the proposed plan's sea level rise adaptation projects would be less than significant (LTS).

Transportation System Impacts

Construction

Risks associated with construction of transportation projects within 0.25 mile of an existing or proposed school would be similar to those for land use impacts in the Growth Geographies. In addition, the same regulatory mechanisms would address the risk. This impact would be less than significant (LTS).

Operation

Implementation of the proposed plan could include transportation system expansions or other improvements near schools. These transportation projects may increase the capacity to transport hazardous materials. However, all materials would be transported, used, stored, and disposed of in accordance with applicable federal, state, and local laws, which would effectively reduce the potential impacts associated with hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Roadway projects in the proposed plan may also improve road safety, thereby reducing the potential for accidents in proximity of schools related to hazardous materials. Therefore, the impacts on existing and proposed schools from implementation of the proposed transportation projects would be less than significant (LTS).

Conclusion

During construction, demolition, and excavation activities, the forecasted development pattern, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan could produce hazardous air emissions or involve the handling of extremely hazardous wastes within 0.25 mile of an existing or proposed school. During operation, land use development projects could use and produce hazardous materials that may be transported on roadways in the plan area. As discussed above, all projects would comply with federal, state, and local regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level, and in particular to protect schools. Existing federal, state, and local regulations and oversight would be sufficient to ensure that hazardous materials stored, used, transported, and disposed of under the proposed plan would not pose a substantial hazard to the public or the environment, including children at schools. Therefore, the proposed plan would have a **less-than-significant (LTS)** impact.

Mitigation Measures

None required.

Impact HAZ-4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment (PS)

Land Use and Sea Level Rise Adaptation Impacts

Construction

Throughout the plan area, there are many sites where historical releases of hazardous materials or wastes have occurred; these are listed in environmental databases pursuant to Government Code Section 65962.5. As indicated in **Table 3.9-1**, above, there are an estimated 19,057 documented sites of contamination in some stage of DTSC or SWRCB oversight in the plan area. These sites range from small releases that have had localized effects on private property and have already been remediated to large-scale releases from long-term historical industrial practices that have had wider ranging effects on groundwater. Specific sites of documented contamination are not evaluated in this analysis because this is a program-level document. Further, because the precise locations of future land use and sea level rise adaptation projects are unknown, an evaluation of the potential for specific sites of known contamination within the plan area to be affected by project activities cannot be conducted at this time. However, the land use growth footprint can be used to generally characterize the potential for release of hazardous materials (i.e., hazardous materials releases are more likely to have occurred in areas that currently or historically supported industrial uses).

Grading and excavation activities may expose construction workers and the public to hazardous substances present in the soil or groundwater that are not anticipated based on information about existing site conditions. These construction activities could inadvertently disperse contaminated material into the environment and expose construction personnel to potentially hazardous conditions. For example, dewatering activities during project construction could accelerate the migration of contaminated groundwater or could discharge contaminated groundwater to surface waters. Potential hazards to human health include ignition of flammable liquids or vapors; inhalation of toxic vapors in confined spaces, such as trenches; and skin contact with contaminated soil or water. These risks would be greatest for construction workers; however, it is possible that the nearby public could be affected if the contaminated materials are of sufficient volume.

Unless construction activities are coordinated with site remediation activities, there could be a temporary increased risk of damaging or interfering with remediation site controls, such as soil containment areas. Temporary effects could include potential localized spread of contamination; exposure of construction workers or the public to chemical compounds in soils, soil gases, and groundwater; exposure of workers, the public, and the environment to airborne chemical compounds migrating from the demolition or construction areas; potential accidents during remediation as a result of operational failure of treatment systems; and potential interference with ongoing remediation activities. Similarly, development near active or abandoned oil and gas wells would be considered by the permitting agency, in conjunction with the property owner and/or developer, on a parcel-by-parcel or well-by-well basis.

A common practice that is typically required by lending institutions when properties change hands is for a Phase I ESA to be prepared to research and disclose the prior uses of the site and the likelihood that residual hazardous materials and/or waste might be present in underlying soil and/or groundwater. Additionally, in many instances, implementing agencies require submittal of a Phase I ESA prior to approval or implementation of a project. These studies include research in a variety of government databases to determine whether the site has had prior underground tanks or other industrial uses that

could result in hazardous materials on or below the ground surface. As described above, if a Phase I ESA indicates the presence or potential presence of contamination, a site-specific Phase II ESA is generally conducted to test soil and/or groundwater. Based on the outcome of a Phase II ESA, remediation of contaminated sites under federal and state regulations may be required prior to development. Any transport of hazardous wastes required during remediation would occur in accordance with the regulations described in Impact HAZ-1.

To be declared a sustainable communities project under PRC Section 21155.1(a)(3), projects must demonstrate that they are not located on any list of facilities and sites compiled pursuant to Section 65962.5 of the Government Code, and the site must be subject to a PEA, which is a type of environmental document typically prepared for sites with DTSC oversight. Overall, PEA requirements are more comprehensive than the requirements for Phase I ESAs. Although they require similar background information, they also include site-specific human health and ecological screening evaluations, public participation requirements, data collection, and scoping activities. The PEA requirement is applicable only to potential exemptions under the sustainable communities strategy provisions of CEQA and does not apply to the other streamlining strategies under Senate Bill 375.

With the notable exceptions for streamlining sustainable communities projects and siting public schools, as discussed above, there are no general regulatory requirements to conduct a Phase I ESA or PEA or a subsequent investigation of potential contamination. Therefore, because it cannot be assumed these practices would regularly occur, the impacts related to changes in land use from implementation of the proposed plan would be potentially significant (PS).

Operation

Proposed plan implementation would result in the construction and operation of the forecasted development pattern and sea level rise adaptation projects. Once developed, it is not expected that additional grading and excavation activities would occur that could expose construction workers and the public to hazardous substances present in the soil or groundwater. Development associated with the forecasted development pattern would have the potential to be located on a listed hazard site. As discussed above under "Construction," there are no general regulatory requirements to conduct a Phase I ESA, PEA, or a subsequent investigation of potential contamination. If future development associated with the forecasted development pattern and sea level rise projects is located on a listed hazard site that has not been investigated or remediated properly, operation of such projects would have the potential to create a significant hazard to the public or the environment. Because this impact is primarily construction-related, it cannot be assumed that Phase I ESA or PEA or subsequent investigation of potential contamination would regularly occur, the impacts related to changes in land use from implementation of the proposed plan would be potentially significant (PS).

Transportation System Impacts

Construction

As discussed above, there are many known sites of contamination in the plan area. Specific sites of documented contamination are not evaluated in this analysis because it is a program-level document. In addition to the hazards described above, land adjacent to roadways may also contain elevated concentrations of lead in exposed surface soils, which could pose a health hazard to construction workers and users of the properties. Lead is a state-recognized carcinogen and reproductive toxicant. Exposure to lead in soil could result in adverse health effects, depending on the duration and extent of exposure. Substantial quantities of aerially deposited lead are understood to be generally confined to within 30 feet of a roadway. Other potential contaminants, including herbicides associated with weed abatement and contaminated ballast rock, are generally confined to the immediate transportation right-of-way. As with land use projects and development, exposure to these hazardous materials and wastes from construction

of transportation projects could cause adverse effects on construction workers, the public, or the environment.

The hazards associated with construction of transportation projects on known sites of contamination at the regional level would be potentially significant (PS) for the same reasons identified above for land use and sea level rise adaptation projects.

Operation

Once developed, it is not expected that additional grading and excavation activities would occur that could expose construction workers and the public to hazardous substances. Because this impact is primarily construction-related, operational impacts would be less than significant (LTS).

Conclusion

The forecasted development pattern, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan could result in hazards from construction on known sites of contamination. Additionally, buildout of the land use growth footprint could result in hazards during operation if projects are located on contaminated sites. The potential for encountering hazardous materials or wastes would be dependent on site-specific conditions. The impact would be **potentially significant (PS)**. Mitigation Measure HAZ-4 addresses this impact and is discussed below.

Mitigation Measures

Mitigation Measure HAZ-4 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- The project proponent shall perform a records review to determine whether there is existing permitted use of hazardous materials or documented evidence of hazardous waste contamination on the project site and provide the results of this investigation to the implementing agency.
- For any project located on or near a hazardous materials and/or waste site pursuant to Government Code Section 65962.5 or sites that have the potential for residual hazardous materials as a result of historic land uses, project proponents shall prepare a Phase I ESA in accordance with the American Society for Testing and Materials' E1527-05 standard.
- For any project located on or near sites that are not listed and do not have the potential for residual hazardous materials as a result of historic land uses, no action is required unless unknown hazards are discovered during development. In that case, the implementing agency shall discontinue development until DTSC, RWQCB, the local air district, and/or other responsible agency issues a determination, which would likely require a Phase I ESA as part of the assessment.
- Develop, train, and implement worker awareness and protective measures to minimize worker and public exposure to an acceptable level and to prevent environmental contamination as a result of construction.
- Projects preparing a Phase I ESA, where required, shall fully implement the recommendations contained in the report. If a Phase I ESA indicates the presence or likely presence of contamination, the project proponent shall prepare a Phase II ESA, and recommendations of the Phase II ESA shall be fully implemented.
- Consult with the appropriate local, State, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps.

Significance after Mitigation

Site evaluation, sampling, and remediation through the Phase I/II ESA process is widely accepted as the appropriate standard for the preliminary evaluation of site hazards. Preparation of, and compliance with, a Phase I ESA for properties at risk of potential hazardous materials and/or waste contamination would avoid adverse impacts associated with buildout because the ASTM procedures establish prescriptive procedures that fully evaluate the potential for risks and appropriate next steps if potential contamination is identified. Phase I/II ESAs required by Mitigation Measure HAZ-4 would include procedural measures to protect and isolate suspected contaminated materials to avoid adverse effects on the workers or public. Therefore, the Phase I/II ESA process would adequately mitigate the potential for future development to create a significant hazard to the public or the environment because it is located on a site that is included on a list of hazardous materials sites. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact would be less than significant with mitigation (LS-M).

Projects taking advantage of CEQA streamlining provisions of Senate Bill 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact HAZ-5: Result in a safety hazard for people residing or working in the planning area for projects located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport (LTS)

Land Use Impacts

There are 25 public use airports in the Bay Area that serve commercial and general aviation users (shown in **Table 3.9-2** and **Figure 3.9-3**). As indicated in **Table 3.9-7**, most (22) of these public use airports are within 2 miles of the proposed plan's land use growth footprint. The proposed plan's land use growth footprint would predominately occur in existing communities and may result in the development of residential and nonresidential land uses in and near airport flight corridors and within areas subject to policies contained in an ALUCP. Development that is not compatible with aviation activity (e.g., tall structures, land uses that produce light/glare, land uses that attract wildlife that can be hazardous to aircraft, noise-sensitive land uses) may lead to conflict between an airport operator and surrounding communities, as well as create long-term operational problems for the airport.

Table 3.9-7: Number of Public/Public Use Airports within 2 Miles of Project Footprint by County

County	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint
Alameda	3	2	3
Contra Costa	1	0	2
Marin	1	1	1
Napa	2	1	0
San Francisco	0	0	0
San Mateo	4	4	2
Santa Clara	4	1	3
Solano	2	1	1
Sonoma	5	4	3
Regional Total	22	14	15

Sources: Caltrans 2023; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

To prevent incompatible uses in areas of higher aircraft hazard potential, the ALUC has adopted ALUCPs with land use policies and criteria. The policies identify what types of land uses are allowed around airports and are intended to protect the safety of people, property, and aircraft on the ground and in the air in the vicinity of the airport. The policies also protect airports from encroachment by new incompatible land uses that could restrict their operations. Structure replacement and infill development are generally permitted under ALUCPs.

Public Utilities Code Section 21001 outlines the statutory requirements for ALUCPs, including referencing the Division of Aeronautics ALUP Handbook. The 1994 ALUP Handbook requires that when preparing an EIR for any project situated within an AIA as defined in an ALUC compatibility plan (or, if a compatibility plan has not been adopted, a boundary within 2 miles of a public use airport is used), lead agencies shall utilize the California ALUP Handbook as a technical resource with respect to airport noise and safety compatibility issues. The California ALUP Handbook was most recently updated in 2011.

There are several military airfields in the Bay Area. The U.S. Department of Defense requires military airfields to adopt Air Installation Compatibility Use Zone studies, which assess compatible land uses in the vicinity of a military air station in a way equivalent to ALUCPs. PRC Section 21098 reduces hazards associated with development near military airports by requiring lead agencies to submit a notice to the military service that would be affected by a proposed general plan amendment or significant project located within specific boundaries of a low-level flight path, military impact zone, or special use airspace.

City and county zoning and planning are required to conform to the ALUCP unless the city or county governing body specifically overrides the ALUCP by supermajority vote. Additionally, California statutes (Business and Professions Code Section 11010; Civil Code Sections 1103 and 1353) now require disclosure for most residential real estate transactions, including new subdivisions, within 2 miles of an airport or within an ALUCP-defined AIA. The Caltrans Division of Aeronautics is also required to review proposals for acquisition of a school site by school districts that are situated within 2 miles of an existing or planned airport runway (Education Code Sections 17215 and 81033). Implementing agencies are responsible for analyzing compliance with ALUCPs as a part of their land use approval authority.

The FAA requires notice of proposed construction for projects located within 20,000 feet (less for runways under 3,200 feet in length) of a public use airport, and other projects that may pose a potential hazard for people residing or working in the project area, due to height, visual hazard, or the attraction of wildlife. Development projects associated with buildout of the plan would be subject to FAA evaluation, and the FAA would be notified of proposed development pursuant to Section 77.11 of the FAA regulations. The notification provides the basis for the FAA to evaluate the proposed development projects for obstruction hazards and potential hazards to air safety.

Implementing agencies would require project sponsors to comply with any applicable ALUCP requirements, as well as any FAA requirements (14 CFR Part 77). Projects within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport would not be approved by local agencies until project design plans have been reviewed and approved by the appropriate ALUC. Because existing regulations and laws related to development near a public airport prohibit the approval of incompatible projects, these existing regulations and permitting requirements of the independent regulatory agencies can be relied upon to address potential project effects. Aviation hazard impacts related to land use changes from implementation of the proposed plan would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

There are 14 public use airports located within 2 miles of sea level rise adaptation projects footprint (see **Table 3.9-7**). Generally, sea level rise adaptation projects would not result in the construction of tall structures that directly impede upon the navigable air space. Sea level rise adaptation projects would be

anticipated to benefit the region's two largest airports (SFO and OAK) by protecting these areas from flooding inundation anticipated to occur because of sea level rise. Any project that creates wetland areas, however, could influence changes in the behavior of waterfowl in a manner that could increase the potential for bird strikes and associated hazards. As described above, implementing agencies would require project sponsors to comply with any applicable ALUCP requirements, as well as any FAA requirements (14 CFR Part 77). Projects within an airport land use plan or within 2 miles of a public airport or public use airport where such a plan has not been adopted would be reviewed by the appropriate ALUC. Because existing regulations and laws related to development near a public airport prohibit the approval of incompatible projects, these existing regulations and permitting requirements of the independent regulatory agencies can be relied upon to address potential project effects. This impact would be less than significant (LTS).

Transportation System Impacts

There are 15 public or public use airports within 2 miles of transportation projects footprint (see **Table 3.9-7**). The transportation projects would be subject to the regulations described above for land use projects. Implementing agencies would require project sponsors to comply with any applicable ALUCP requirements, as well as any FAA requirements (14 CFR Part 77). Projects within an airport land use plan or within 2 miles of a public airport or public use airport where such a plan has not been adopted would not be approved by local agencies until project design plans have been reviewed and approved by the appropriate ALUC. These existing regulations and permitting requirements of independent regulatory agencies would address potential project effects. Safety hazards due to development of the transportation projects anticipated in the proposed plan near public use airports would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would have a **less-than-significant (LTS)** impact because there are existing federal, State, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with development near airports to an acceptable level.

Mitigation Measures

None required.

Impact HAZ-6: Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan (PS)

Land Use Impacts

Local government jurisdictions are required to adopt emergency plans (e.g., the 2008 City and County of San Francisco Emergency Response Plan [updated 2017] [City and County of San Francisco 2017] and various emergency operations plans [Alameda County 2025; Solano County 2024b; San Mateo County 2015; Santa Clara County 2017; Sonoma County 2022]), which are considered to be extensions of the California Emergency Plan, established in accordance with the Emergency Services Act. Implementation of these plans could be impaired if multiple projects are constructed at the same time and therefore could result in concurrent blockage of multiple roadways used for emergency routes. Failure to provide reasonable access for emergency equipment and evacuation of civilians can result in the loss of life, property, and natural resources.

Construction

Construction associated with implementation of the proposed plan would not hinder emergency response activities or physically interfere with established evacuation routes. Although construction activities could temporarily impair roadways used for emergency response and evacuation, standard

construction procedures for development of a construction management plan would address these conditions and would develop alternative routes. Projects requiring encroachment permits for temporary construction activities in public roadways that could be used for emergency response or evacuation are generally required to prepare traffic mitigation plans that address traffic control during the period when project construction is occurring within public right-of-way. Standard construction procedures provided in traffic mitigation plans to address temporary road closures that would be required during construction, include notification of emergency responders. Although implementation of construction traffic management plans and associated coordination with service providers would typically address potential interference with emergency response or evacuation plans, there is a potential that temporary impairment could occur at the project level. This would be potentially significant (PS).

Operation

The proposed plan includes housing and economic strategies to accommodate approximately 1.8 million new persons, 1 million new households, 1.5 million new forecasted housing units, and 1.4 million new jobs by 2050 (compared to the 2020 baseline). Implementation of the proposed plan would focus growth in existing urbanized areas, which would result in more dense and intense development compared to existing conditions. Moreover, the development pattern encouraged by the proposed plan could result in lower rates of automobile ownership. However, development that proposes large concentrations of people (such as a job center) or that would site individuals who require special assistance (such as a hospital or senior facility) in an area with identified hazards could cause adverse effects related to the implementation of countywide and jurisdictional emergency plans because there would be more individuals potentially subject to these hazards. High density development could, in the event of an emergency such as a wildfire, result in more people using the same evacuation routes. Implementation of emergency plans could be impaired if emergency plans are not properly updated to reflect changes in land use. While transportation projects may result in a more efficient transportation system, it cannot be assured that, during an emergency, they would be adequate for sufficiently quick evacuation. As shown in **Table 2-8** in Chapter 2, "Project Description," transportation projects footprints would be increased, but the increase in population and employment will result in an increase in the average trip time of 19% (see **Table 2-12**), suggesting an overall increase in congestion.

Emergency response and emergency evacuation plans are designed by the Office of Emergency Services for each county in the region to respond to a possible emergency situation (e.g., fires, floods, earthquakes). These plans cover all of the land within the region, including both incorporated and unincorporated areas, and provide a process for evacuating people from danger and preventing or minimizing loss of life and property. In addition, the Bay Area RECP provides a framework for collaboration and coordination during regional events, as well as critical linkages to ensure that existing Bay Area emergency response systems work together.

The RTEMP, as a counterpart to the RECP, is designed to enable regional transportation response to the entire spectrum of regional contingencies, ranging from relatively modest incidents that affect one or two counties to large-scale disasters that affect the entire nine-county Bay Area. MTC developed the RTEMP in coordination with state agencies, the office of emergency services for each of the nine counties in the region (referred to as "operational areas"), and 14 transit operators. The plan, which is characterized as a "living document," is reviewed annually, and updated as appropriate.

An assumption of the RTEMP is that decisions regarding planning for, responding to, and recovering from an emergency should be made at the most local level possible. The operational areas are responsible for emergency response within a county and all political subdivisions within the county area (e.g., cities, special districts). These are often coordinated with the agency's general plan, as discussed above. Transportation agencies have also developed their own emergency operations plans that address internal procedures, operations, and response protocols to be implemented during an emergency. The

management of emergency response and emergency evacuation plans includes regular updates to these plans that incorporate new or proposed developments. The RTEMP does not supersede or override any of these plans or any other locally created emergency management plans or procedures.

In the event of a major disaster, particularly an earthquake, it is assumed that bridges and tunnels serving transbay corridors could be damaged or closed for assessment. Ferries and other maritime assets may play vital roles in providing both emergency response and basic transportation services. Ferries may also be resources for providing both basic and emergency regional transportation, via expanded services on existing routes and via temporary services in relief of other damaged or otherwise closed transportation facilities. MTC would facilitate public transportation through the Trans Response Plan (MTC 2018).

In summary, there are a variety of adopted emergency response and evacuation plans in the plan area. In addition to the plans maintained at the county-level, coordinated plans have been adopted for the nine-county plan area to facilitate emergency response and evacuation. These plans anticipate the necessity of regional transit and ferry service to facilitate response and evacuation. Using transit systems, including buses, train, and ferries, is an additional means of evacuating people during a less rapid but urgent evacuation in addition to highway evacuation via personal automobile. The proposed plan includes investments in transit systems along with the emphasis on growth near transit that could serve as vital resources. However, increased population and employment anticipated in the plan could increase congestion on evacuation routes and slow evacuation. This could impair implementation of emergency response or evacuation plans, particularly if local plans rely on evacuation via personal vehicle. While changes in land use would be reflected in updated emergency and evacuation plans, it is not known if the changes would be sufficient to ensure adequate evacuation. The proposed plan's impact on adopted emergency response or evacuation plans would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction

Construction associated with sea level rise adaptation projects would not hinder emergency response activities or physically interfere with established evacuation routes. Projects requiring encroachment permits for temporary construction activities along public roadways that could be used for emergency response or evacuation are generally required to prepare traffic mitigation plans that address traffic control during the period when project construction is occurring within public right-of-way. To address any temporary road closures that would be required during construction, standard construction procedures include notification of emergency responders. Although implementation of traffic mitigation plans and associated coordination with service providers would typically address potential interference with emergency response or evacuation plans, there is potential that temporary impairment could occur at the project level. This would be potentially significant (PS).

Operation

Once implemented, the sea level rise adaptation projects would not be expected to impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. Rather, the projects would be anticipated to benefit these programs by protecting areas from potential hazards, including flooding, in a manner that facilitates implementation of established plans. Projects like elevating highways could improve future access and evacuation routes that may otherwise be inundated and unusable in the future. Following construction, the sea level rise adaptation projects would facilitate implementation of emergency response and evacuation plans by modifying and protecting key roadways used for evacuations. The potential for development to impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan would be less than significant (LTS).

Transportation System Impacts

Construction

As discussed above, temporary road closures required during construction would not likely hinder implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. However, standard construction mitigation includes notification of emergency responders where road closures are required. Road closures would be temporary and would be coordinated with emergency responders so that alternative evacuation routes could be developed and employed. Projects requiring encroachment permits for temporary construction activities in public roadways that could be used for emergency response or evacuation are generally required to prepare traffic mitigation plans that address traffic control during the period when project construction is occurring within public right-of-way. Although implementation of traffic mitigation plans and associated coordination with service providers would typically address potential interference with emergency response or evacuation plans, there is potential that temporary impairment could occur at the project level. This would be potentially significant (PS).

Operation

Although the proposed plan, overall, is predicted to increase trip time, the proposed transportation projects would generally increase mobility and circulation capacity and thereby would have the potential to improve response times for police, fire, and emergency service providers, especially in heavily congested areas. Also, with implementation of the proposed transportation projects that include improved transit opportunities, more people would be able to move through the regional transportation system, thereby facilitating efficient access to these developments by public service providers. In addition, as described above, emergency plans and programs are in place on a state, regional, countywide, individual jurisdiction, and special district level that contain measures to reduce impacts associated with conflicts with emergency response and evacuation plans. These existing measures ensure that transportation network improvement projects would not impair implementation of or physically interfere with an emergency response or evacuation plan. This would be less than significant (LS).

Conclusion

Temporary impairment of emergency response and evacuation plans could occur due to the forecasted development pattern, sea level rise adaptation projects, and transportation projects. The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the proposed plan would be subject to implementation of applicable state and federal regulations, as well as local/regional requirements for adequate emergency response and emergency evacuation plans, such as those required by the California Emergency Services Act and Cal EMA. Emergency and evacuation plans are periodically updated to accommodate growth and would continue to be updated for growth and changes in projected development associated with the proposed plan.

Using transit systems, including buses, trains, and ferries, is an additional means of evacuating people during a less rapid but urgent evacuation in addition to highway evacuation via personal automobile. As discussed in Section 3.9.2, “Regulatory Setting,” the RTEMP is intended to help Bay Area public transportation agencies recover operations and deliver basic transportation services after a significant regional disaster. All major transit operators in the Bay Area are participants of the RTEMP, including Alameda Contra Costa Transit, Bay Area Rapid Transit, Caltrain, San Francisco Municipal Transportation Agency, Sonoma-Marin Area Rail Transit, and Santa Clara Valley Transportation Authority. The proposed plan includes significant investments in transit systems along with the emphasis on growth near transit that could serve as vital resources to facilitate evacuation. However, increased population and employment anticipated in the plan could increase congestion on evacuation routes and slow evacuation. This could impair implementation of emergency response or evacuation plans. While changes in land use would be reflected in updated emergency and evacuation plans, it is not known if the changes would be

sufficient to ensure adequate evacuation. Therefore, while the improved transportation system efficiency may facilitate emergency response and evacuation plans, due to the uncertainty with respect to the ability to accommodate forecasted growth, potential impacts related to interference with emergency response and evacuation plans would be **potentially significant (PS)**. Mitigation Measure HAZ-6 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure HAZ-6 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Continue to participate in the San Francisco Bay Area Regional Transportation Emergency Management (RTEMP), review the plan annually, and update as appropriate.
- Develop new methods of conveying projected and real time evacuation information to citizens using emerging electronic communication tools including social media and cellular networks.
- Adopt and/or revise, as appropriate, local emergency response and evacuation plans that address growth and potential for congestion on evacuation routes. Include contingencies for lower private automobile ownership and reliance on public transit for evacuation, consistent with the RTEMP.
- Require specific projects to demonstrate consistency with all applicable emergency response and evacuation plans. Where temporary road closures would be required during construction, prepare traffic mitigation plans that address traffic control and establish alternate emergency response and evacuation routes in coordination with emergency service providers.

Significance after Mitigation

The mitigation described above would address the need for adequate emergency access through continued participation in the RTEMP. It would also require that emergency plans account for shifting transportation modes. The mitigation would also require individual projects to ensure that future development would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. To the extent that a local agency requires an individual project to implement all feasible mitigation measures described above, the impact would be less than significant with mitigation (LS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact HAZ-7: Exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides due to projected land use patterns and infrastructure in or near State Responsibility Areas or land classified as very high hazard severity zones (PS)

Land Use Impacts

Construction and Operation

As a result of climate change, wildfires are burning more landscape at higher intensities across the globe, on the West Coast, and in particular, in the San Francisco Bay Area. Damage to homes, infrastructure, and ecosystems can result, and associated air and water quality effects may extend far beyond the fire footprint. As described in Chapter 2, “Project Description,” the regional growth forecast for the Bay Area

projects that between 2020 and 2050 the region will support an additional approximately 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. As the population of the plan area is forecasted to increase, there could be increased wildfire hazards if development expands into the wildland-urban interface (WUI). The proposed plan's Growth Geographies—designated areas prioritized to accommodate future household and job growth—avoid areas defined as "Very High" and "High" FHSZs identified by CAL FIRE (see Section 2.3.4). Additionally, the proposed plan addresses wildfire with many land use (i.e., housing and economy) and environmental strategies, relying on core adaptation principles: land use, land management, and structural hardening. The proposed plan would accommodate forecasted population growth in a manner that reduces potential contributions to climate change, encourages concentrated growth in urbanized areas and land management in open space, and includes structural hardening efforts where existing structures are vulnerable to fire.

Wildfire prevention is a shared responsibility among federal, state, and local agencies, including local city and county fire departments, as well as landowners and residents. Federal lands fall under Federal Responsibility Areas. The National Fire Plan provides the necessary coordination between agencies in areas of federal lands. Most of the unincorporated areas of the Bay Area are SRAs where fire prevention is the responsibility of CAL FIRE. Incorporated areas, and some unincorporated lands, are classified as LRAs. Fire prevention and response in these areas are typically addressed by city and county fire departments. CAL FIRE identifies FHSZs at the local and state level that cover all fire-prone areas in the state, regardless of land ownership or responsibility.

The land use growth footprint was used to quantify the acreage of the plan area within fire hazard zones that could develop between 2020 and 2050. As previously noted, the proposed plan prioritizes growth in the designated Growth Geographies which avoid areas defined as "Very High" and "High" FHSZs, but does not avoid areas defined as "Moderate." The proposed plan's strategies focus 73% of the land use growth footprint into the designated Growth Geographies; however, the remainder (27%) of the land use growth footprint is outside designated Growth Geographies but consistent with existing local land use plans (see **Table 2-3**). In total, the land use growth footprint includes approximately 540 acres of land classified as having a moderate, high, or very high fire hazard. This is less than 2% of the growth footprint (see **Table 3.9-8**).

Table 3.9-8: Acreage of Land Use Growth Footprint within Fire Hazard Severity Zones by County

County	Moderate (acres)	High (acres)	Very High (acres)
Alameda	< 1	4	90
Contra Costa	10	7	110
Marin	7	10	10
Napa	0	< 1	3
San Francisco	0	0	0
San Mateo	8	3	30
Santa Clara	< 1	< 1	30
Solano	10	20	0
Sonoma	110	20	70
Regional Total	150	60	330

Notes: TPA acreages are a subset of county acreages. Numbers less than 1 are shown as "<1"; Whole numbers have been rounded (between 0 and 10 to the nearest whole number and between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Sources: CAL FIRE 2024c; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In addition to potentially exposing people to loss, injury, or death and damage to property, fire can result in indirect hazards. These may include release of hazardous materials and air quality implications, as well as flooding and landslides following loss of vegetation. Excessive rainfall in fire-damaged areas can generate runoff that causes flooding because the top layer of soil can form a moisture barrier when exposed to high heat that repels water and generates higher runoff rates. In addition, the loss of vegetation to provide stability can increase susceptibility to erosion. In areas with steep slopes, debris flows can result from these conditions that may result in hazards to life and physical property, destroy or strip vegetation, block existing drainage patterns, and affect roadways and other infrastructure. If this were to occur within existing floodplains, existing flow conditions may be altered, or new sources of flooding may be created.

Development of areas susceptible to wildfire could exacerbate the fire risk by introducing anthropogenic influence into fire-prone open space. Human-caused wildfires tend to be generated by activities such as debris and brush-clearing fires, electrical equipment malfunctions, campfire escapes, smoking, fire play (e.g., fireworks), vehicles, and arson. Power lines also pose a risk of spark as a result of downed lines, direct contact with vegetation, and line faults and equipment failures. Power lines would continue to be constructed and operated by utility companies, subject to the oversight of the California Public Utilities Commission. These companies are obligated to manage and maintain the lines to reduce the potential for wildfire. This includes clearing vegetation near the power lines and may include operating provisions to temporarily stop power during high winds where the fire danger is high. Construction and operation of utilities to serve the growth areas is not anticipated to substantially exacerbate fire hazards outside of the immediate Growth Geographies.

Features of the plan that would reduce the potential to exacerbate the risk of wildfire include maintaining the urban growth boundaries, directing growth away from areas with the highest fire hazard severity potential, and supporting vegetation management on conservation lands. Specifically, the proposed plan includes Strategy EN4, Maintain Urban Growth Boundaries, which does not enable growth beyond current boundaries and locates Growth Geographies (Priority Development Areas, Priority Production Areas, Transit-Rich Areas, High-Resource Areas) outside of the worst FHSZs (as defined by CAL FIRE's Very High FHSZs in incorporated areas and by High or Very High FHSZs in unincorporated areas). These restrictions would be augmented by WUI zones, where they have been adopted at the county level. Together, these strategies limit further growth in the areas most at risk of wildfire. Open space and working lands management is included in the proposed plan to reduce the intensity of future fires. Specifically, Strategy EN05, Protect and Manage High-Value Conservation Lands, includes expanded new revenues beyond what already exist to support wildfire management. Structural hardening combats the risk in communities already built in the highest fire risk zones. Strategy EN2, Provide Means-Based Financial Support for Seismic, Wildfire, and Accessibility Home Retrofits, includes fire-resistant roofing and defensible space retrofits for 105,000 homes. Together, these strategies would focus future growth away from the highest fire risk zones, support increased wildland management programs, and support residential building upgrades that reduce the likelihood for damage when fires occur in the WUI. Another component of the proposed plan's environmental approach would provide means-based financial support to retrofit existing residential buildings. This could reduce the potential for these structures to cause fires due to damage caused by a seismic event.

Throughout the plan area, new construction would be subject to Title 24 of the CCR, which includes safety measures to minimize the threat of fire. The provisions of the fire code would apply to all construction, alteration, replacement, removal, and demolition. The risk of accidental ignition of a wildland fire during construction in forested areas would be addressed through standard construction practices, which address the potential for sparks generated by construction equipment, the potential for spills of ignitable materials, and emergency procedures to immediately respond to these conditions. In addition, Title 14 of the CCR sets forth the minimum development standards for emergency access, fuel modification,

setback, signage, and water supply, which help prevent damage to structures or people by reducing wildfire hazards within SRAs. Local jurisdictions' general plan policies and building codes enforce and expand on these requirements at the local level. All jurisdictions are required to review and update their safety element in conjunction with the next housing element revision to address the risk of fire in SRAs and Very High FHSZs and the provisions outlined in "Fire Hazard Planning" by the Governor's Office of Land Use and Climate Innovation. Projects developed under the plan would not be approved by local agencies until project design plans demonstrate compliance with applicable fire safety requirements. The proposed plan would not conflict with the ongoing efforts of CAL FIRE and others to create natural environments that are more resilient to fire through fire plans that include prefire planning and fuel treatment. Potential conflicts with existing emergency response and evacuation plans are addressed in Impact HAZ-6, above.

As noted above, the estimated area of potential effects could be overstated. Projects located on land identified by CAL FIRE as subject to wildland fire hazard would not qualify as sustainable communities projects under PRC Section 21155.1 unless the applicable general plan or zoning code contains provisions to mitigate the risk of a wildland fire hazards (PRC Section 21155.1[a][6][A]). (Note, however, that PRC Section 21155.1[a][6][A] is applicable only to projects seeking potential exemptions under the sustainable communities strategy provisions of CEQA and does not apply to the other streamlining strategies under the Sustainable Communities Act.)

As an example, the Alameda County General Plan includes a series of 18 policies to address wildfire hazards and require adherence to the provisions of the Alameda County Fire Protection Master Plan and Fire Hazard Mitigation Plan (Alameda County 2022).The City of Oakland's Safety Element has policies and related actions addressing reduction and prevention of wildfire hazards, including implementation of the 2024 wildfire prevention assessment district for the Oakland Hills, which reinstituted a prior assessment, and participation in multi-jurisdictional programs and task forces that work to reduce the threat of wildfires. Similarly, other incorporated cities in Alameda County include safety elements, environmental hazards elements, Disaster Preparedness and Safety Element, or similar General Plan elements that include policies to address wildfire risk. Policies that address wildland fire risk are contained in the "Fire Services" section of the Public Facilities Element in the general plan for Contra Costa County. In addition, the Health and Safety Element includes policies and actions designed to result in building practices that reduce the hazard to new construction within fire hazard areas (Contra Costa County 2024b). The Marin Countywide Plan includes Policies EH 4.3,EH4.5, and EH 4.6, which have provisions to adopt and implement a fire management plan, ensure adequate emergency response, and implement land use regulations as a means of protecting people and property from wildfire hazards (Marin County 2023). Marin County passed Measure C, a countywide parcel tax, in 2020 to fund proactive, state-of-the-art wildfire prevention and preparedness efforts.

As discussed above, California is trending toward an increase in the severity and frequency of wildfires over time as a result of climate change, modified vegetation regimes, and increasing human influence. Such trends are expected to continue and will pose an increasing threat to wildland areas and nearby urban environments. The proposed plan, however, is designed to accommodate anticipated population growth in a manner that reduces potential contributions to climate change, encourages concentrated growth in developed areas and land management in open space, and includes structural hardening efforts where existing structures are vulnerable to fire. Nonetheless, because development could occur near land classified as very high FHSZs and could indirectly result in extension or expansion of infrastructure through these areas, there is potential for the proposed plan to exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides. This impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Sea level rise adaptation projects would protect communities and infrastructure from the adverse effects of anticipated sea level rise. As shown in **Figure 2-3** of Chapter 2, "Project Description," key sea level rise adaptation projects have been identified primarily along the shores of the San Francisco Bay. These areas are generally outside of areas mapped as prone to wildfire by CAL FIRE (see **Figure 3.9-4**). As shown in **Table 3.9-9**, the footprint for sea level rise adaptation projects includes approximately 2,700 acres of lands in moderate FHSZs, 1,200 acres of lands in high FHSZs, and 190 acres of lands in very high FHSZs, with nearly all of this within Marin County.

Table 3.9-9: Acreage of Sea Level Rise Footprint within Fire Hazard Severity Zones by County

County	Moderate (acres)	High (acres)	Very High (acres)
Alameda	0	0	0
Contra Costa	0	1	0
Marin	2,440	490	160
Napa	0	0	0
San Francisco	0	0	0
San Mateo	9	620	30
Santa Clara	0	0	0
Solano	0	0	0
Sonoma	210	50	0
Regional Total	2,700	1,200	190

Notes: Numbers less than 1 are shown as "<1"; Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, and between 1,000 to 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.
Sources: CAL FIRE 2024c; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Sea level rise adaptation projects include elevating roadways and rail, as well as installing and improving sea walls, levees, and tidal gates. As discussed above for land use projects, new construction would be subject to safety measures that minimize the threat of fire as stated in the Title 24 of the CCR, and would comply with CCR Title 14 to minimize exposing people and structures to loss, injury, or death and damage. Therefore, although there could be an elevated risk of accidental ignition of a wildland fire during construction in vegetated areas, the potential for standard construction practices to result in wildland fire would not be substantially increased because of the sea level rise adaptation projects identified in the plan. During operation, the sea level rise adaptation projects would not result in new infrastructure that would exacerbate fire risk and would not provide increased access into wildfire-prone areas. The elevated roadways, sea walls, levees, and tidal gates would prevent or mitigate flooding impacts of sea level rise, which would improve the resilience of the transportation infrastructure along coastal areas. This would benefit emergency access and evacuation during a wildfire. These projects are not anticipated to result in an increased fire risk and would, therefore, not exacerbate the potential for associated pollutant releases or flooding and landslides. This impact would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

As shown in **Table 3.9-10**, approximately 180 acres of the transportation projects footprint are proposed in moderate FHSZs and 450 acres of projects are proposed in high FHSZs. Less than 1 acre of land designated for transportation projects is located within a very high FHSZ. As discussed above for land use projects, implementing agencies would require project sponsors to comply with safety measures that minimize the threat of fire as stated in the Title 24 of the CCR, as well as comply with CCR Title 14, Division

1.5 to minimize exposing people and structures to loss, injury, or death and damage. Therefore, although there could be an elevated risk of accidental ignition of a wildland fire during construction in forested areas, the potential for standard construction practices to result in wildland fire would not be substantially increased because of the transportation investments identified in the plan.

Table 3.9-10: Acreage of Transportation Projects Footprint within Fire Hazard Severity Zones by County

County	Moderate (acres)	High (acres)	Very High (acres)
Alameda	120	280	0
Contra Costa	8	50	0
Marin	7	90	0
Napa	0	0	0
San Francisco	0	0	0
San Mateo	0	0	0
Santa Clara	4	10	0
Solano	20	30	< 1
Sonoma	20	0	0
Regional Total	180	450	< 1

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number and between 11 and 999 to the nearest 10). Numbers less than 1 are shown as "<1." Figures may not sum due to independent rounding.
Sources: CAL FIRE 2024c; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

As described above, projects that involve the expansion or extension of the transportation system may also expose more land uses to risks associated with wildland fires, particularly at the urban edge. Providing increased access into wildfire-prone open space increases the potential for human-caused wildfires both as a result of direct access and due to the introduction of potential ignition sources (e.g., vehicles, cigarettes) along the transportation corridor. However, transportation improvements, especially capacity improvements, also generally improve the transportation network to move people more efficiently. This is beneficial for emergency access and evacuation due to a wildfire. The potential for wildfire hazard impacts related to transportation projects in the proposed plan would be potentially significant (PS) due to the potential for the infrastructure to exacerbate fire risk.

Conclusion

Implementation of the proposed sea level rise adaptation projects would not exacerbate the risk of wildfire in or near SRAs or land classified as very high FHSZs and would not exacerbate the potential for associated pollutant release or flooding and landslides. Impacts from sea level rise adaptation projects would be less than significant. Implementation of the proposed plan's forecasted development pattern and transportation projects could exacerbate the risks of wildfire in or near SRAs or land classified as very high FHSZs. Extension of development along the WUI areas can result in loss of property and structures, as has been observed in several fires within the plan area including the 1991 Tunnel fire, the 2017 Tubbs fire, and the large fires in 2020 that burned over 700,000 acres within and adjacent to the plan area during the SNU Lightening Complex fires and LNU Lightening Complex fires. This would be a **potentially significant (PS)** impact. Mitigation Measure HAZ-7 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure HAZ-7 Implementing agencies and/or project sponsors shall implement measures, as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Ensure that development of areas mapped by CAL FIRE as high and very high fire hazard severity zones complies with Title 14 of the California Code of Regulations minimum wildfire protection standards.
- Implementing agencies shall improve and educate residents and businesses regarding local emergency communications and notifications.
- Implementing agencies shall enforce defensible space regulations to keep overgrown and unmanaged vegetation, accumulations of trash and other flammable material away from structures.
- Implementing agencies shall provide public education about wildfire risk and fire prevention measures, and safety procedures and practices to allow for safe evacuation and/or options to shelter-in-place.
- Implementing agencies shall plan for and promote rapid revegetation of burned areas to help prevent erosion and protect bare soils.
- Implementing agencies shall develop a regulatory mechanism for permitting an aggressive hazardous fuels management program.
- Implementing agencies shall establish standards for fuel breaks that can slow or stop a wildfire advancing into a community or into the wildlands. Fuel breaks shall be strategically located to protect a community, structures, or routes of access and egress. Strategic locations may include ridgelines, greenbelts, or other locations to manage embers or support community-level fire suppression tactics.
- MTC shall facilitate minimizing future impacts to fire protection services through information sharing regarding fire-wise land management (vegetation data, fire-resistant building materials, locations where development is vulnerable to wildfire, and best practices for safe land management) with county and city planning departments.
- MTC, in partnership with technical experts and stakeholders, shall launch or continue existing initiatives to help local cities and counties to protect Bay Area communities and economies from the disruption of wildfire occurrences. Initiatives could include but not be limited to seminars that review the risk of wildfire and approaches for preparation, including strengthening of infrastructure, emergency services, emergency evacuation plans and reviewing building safety codes.

Significance after Mitigation

Curtailing development in areas mapped by CAL FIRE as high and very high FHSZs, in conjunction with the mitigation measures and elements of the plan that would promote land management in open space to reduce fire hazards, would substantially reduce the potential for the plan to exacerbate wildland fire risks. However, because development could occur in and near SRAs and lands classified as very high FHSZs, and because the potential for people or structure to be exposed to significant risk of loss, injury, or death involving wildfire cannot be avoided, this impact would be **significant and unavoidable (SU).**

Projects taking advantage of CEQA streamlining provisions of Senate Bill 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

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3.10 HYDROLOGY AND WATER QUALITY

This section analyzes the surface water and groundwater resources of the Bay Area. Stormwater runoff, flooding, and inundation hazards are also addressed in this section. For a discussion of water supply impacts, including drought, see Section 3.14, "Public Utilities and Facilities."

Comments received in response to the Notice of Preparation for this EIR expressed concerns about water quality and the effect of additional impervious surfaces on stormwater runoff and groundwater recharge areas. These issues are addressed in the impact discussions below. Comments were also received regarding the effects of flooding related to sea level rise. For a discussion of sea (and bay) level and groundwater rise impacts, see Section 3.6, "Climate Change, Greenhouse Gases, and Energy."

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor the statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.10.1 Environmental Setting

CLIMATE

Climatic conditions in the Bay Area are generally characterized as Mediterranean with moist, mild winters and hot, dry summers. However, the region's varied topography creates several microclimates dependent upon elevation, proximity to the San Francisco Bay or coast, and orientation. As a result, stark climatic differences in temperature, rainfall amounts, and evapotranspiration can occur over relatively short distances. The Bay Area is largely governed by weather patterns originating in the Pacific Ocean, primarily by the southern descent of the Polar Jet Stream, which brings midlatitude cyclonic storms in winter. More than 90% of precipitation in the Bay Area falls between November and April. Bay Area lowlands (i.e., valley bottoms) receive an annual rainfall of about 15–20 inches in the South Bay and about 20–25 inches in the North Bay. Higher elevations in the region, particularly along the north- or west-facing slopes of the North Bay, may receive over 40 inches of rain per year. In the summer, the Hawaiian High Pressure cell over the northern Pacific creates mild and dry weather for the region. However, summer in the Bay Area is also known for its thick marine fog layer, which is brought into the San Francisco Bay by a diurnal westerly breeze formed by the strong pressure gradient between the hot Central Valley and the cooler coastal areas. This moist air is cooled to dewpoint when it crosses the cooler waters of the California Current near the coast. This advection process results in a thick fog forming just offshore, which is pulled eastward through gaps and passes into the Bay Area. Fog diminishes with distance inland from the bay (MTC and ABAG 2013). **Table 3.10-1** summarizes monthly and annual average precipitation for select sites throughout the Bay Area.

Table 3.10-1: Average Monthly Precipitation, Selected Bay Area Sites

Site	Inches[1]												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Fairfield (1950–2016)	4.8	4.0	3.1	1.4	0.6	0.2	0.0	0.1	0.2	1.3	2.8	4.3	22.7
Los Gatos (1893–2016)	6.1	5.2	4.3	1.7	0.6	0.1	0.0	0.1	0.3	1.2	2.5	4.9	26.9
Napa, State Hospital (1893–2016)	5.1	4.4	3.4	1.7	0.7	0.2	0.0	0.1	0.3	1.4	3.0	4.5	24.7
Oakland, Airport (1948–2016)	3.7	2.7	2.6	1.4	0.4	0.2	0.0	0.1	0.2	1.1	2.5	3.1	18.0
Redwood City (1906–2016)	4.4	3.5	2.7	1.2	0.4	0.1	0.0	0.1	0.2	1.0	2.1	3.5	19.2
Richmond (1950–2016)	4.8	3.8	3.3	1.7	0.5	0.2	0.0	0.1	0.2	1.3	2.9	4.4	23.2
San Francisco Oceanside (1948–2016)	4.0	3.6	2.8	1.2	0.5	0.2	0.0	0.1	0.2	1.1	2.7	3.8	20.0
San Rafael, Civic Center (1894–2016)	8.1	6.5	4.7	2.0	0.7	0.2	0.0	0.1	0.4	1.9	4.1	6.8	35.6
Santa Rosa/Sonoma (1998–2016)	5.5	6.2	4.4	2.1	1.2	0.3	0.0	0.0	0.1	1.9	3.5	7.1	32.2

[1] Rounded to the nearest one-tenth of an inch.

Source: Western Regional Climate Center 2016.

REGIONAL HYDROLOGY

San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties, of which seven border the bay. The San Francisco Bay is partially enclosed and is relatively shallow (BCDC 2020). Median depth, based on mean sea level, varies from roughly 8 feet in San Pablo Bay to 36 feet in the central area of the bay near the Golden Gate Bridge. Much of the perimeter of the bay is shallow tidal mud flats, tidal marshes, diked or leveed agricultural areas, and salt ponds. The north lobe of San Francisco Bay is brackish and is known as San Pablo Bay. It is surrounded by Marin, Sonoma, Napa, and Solano Counties. Suisun Marsh is between San Pablo Bay and the Sacramento–San Joaquin Delta (Delta) and is the largest contiguous brackish marsh on the west coast of North America, providing more than 10% of California's remaining natural wetlands. The south and central lobes of San Francisco Bay are saltier than San Pablo Bay, as the marine influence dominates (DWR 2013).

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40% of California. Water from the Sacramento and San Joaquin Rivers of the Central Valley flows into what is known as the Delta region, then into the subbays, Suisun Bay and San Pablo Bay, and finally into the central area of the bay and out the Golden Gate strait. The Delta is a large triangle of interconnected sloughs and agricultural "islands" that form a key link in California's water delivery system. Some of the fresh water flows through the Delta and into the bay, but much is diverted from the bay for agricultural, residential, and industrial purposes, as well as delivery to distant cities of southern California as part of State and federal water projects.

The two major drainages, the Sacramento and San Joaquin Rivers, receive more than 90% of runoff during the winter and spring months from rainstorms and snowmelt. Other surface waters flow either directly to the bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the bay covers a total area of 3,464 square miles. The largest watersheds include the Alameda Creek (695 square miles), the Napa River (417 square miles), and the Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals.

The interaction between Delta outflow and Pacific Ocean tides determines how far salt water intrudes into the Delta. The salinity of the water varies widely as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the central area of the bay can vary from near oceanic levels to one-quarter as much, depending on the volume of freshwater runoff, which depends on precipitation, reservoir releases, and upstream diversions. An average of 18.4 million acre-feet of fresh water flows out of the Delta annually into the bay (DWR 2013: SFB-11).

Surface Waters

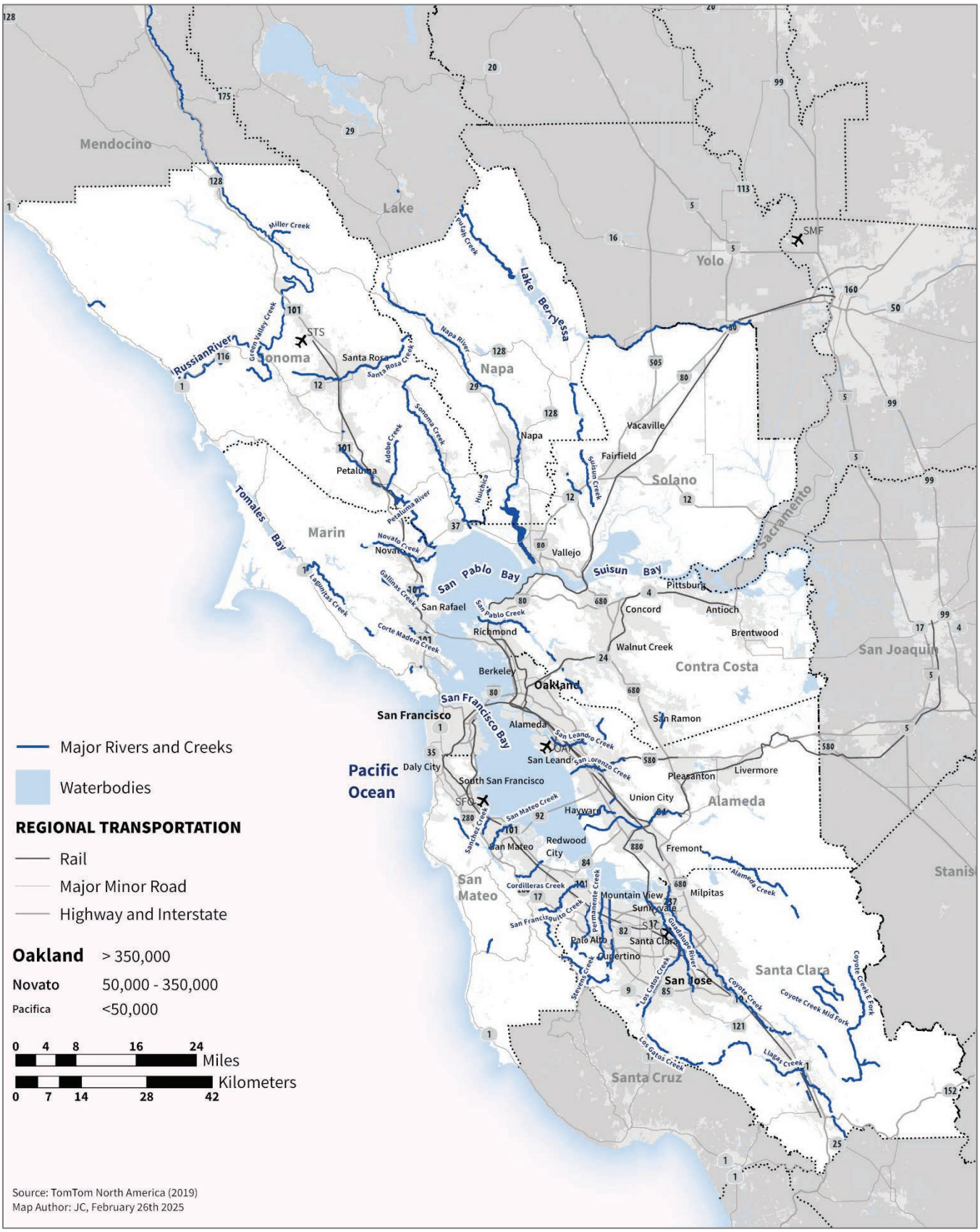
Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Many of the original drainages toward the San Francisco Bay have been channelized and put underground through urbanization of the area. Estuarine waters include the Delta from the Golden Gate Bridge to the Sacramento and San Joaquin Rivers, as well as the lower reaches of various streams that flow directly into the bay, such as the Napa and Petaluma Rivers in the North Bay and the Coyote and San Francisquito Creeks in the South Bay. Major water bodies, including creeks and rivers, in the Bay Area are presented in **Figure 3.10-1**. The following major rivers and streams, listed by county, are located in the Bay Area:

- Alameda County: Alameda Creek, San Leandro Creek, and San Lorenzo Creek;
- Contra Costa County: San Pablo Creek;
- Marin County: Corte Madera Creek, Lagunitas Creek, Gallinas Creek, Miller Creek, and Novato Creek;
- Napa County: Huichica Creek and Napa River;
- San Francisco County: none;
- San Mateo County: Cordilleras Creek, San Mateo Creek, and Sanchez Creek;
- Santa Clara County: Adobe Creek, Coyote Creek, Guadalupe River, Llagas Creek (drains to the Pacific Ocean via the Pajaro River), Los Gatos Creek, Permanente Creek, San Francisquito Creek, and Stevens Creek;
- Solano County: Green Valley Creek, Napa River, Putah Creek, and Suisun Creek; and
- Sonoma County: Petaluma River, Russian River, Santa Rosa Creek, and Sonoma Creek.

Groundwater

A groundwater basin is an area underlain by permeable materials capable of storing a significant amount of water. Groundwater basins are closely linked to local surface waters. As water flows from the hills toward San Francisco Bay, it percolates through permeable soils into the groundwater basins. The entire Bay Area region is divided into a total of 28 groundwater basins, and two of those basins (Napa-Sonoma Valley and Santa Clara Valley) are further divided into subbasins. **Table 3.10-2** includes groundwater basin sizes, by acres.

Figure 3.10-1: Major Rivers, Creeks, and Other Water Bodies



Source: TomTom North America 2019.

Table 3.10-2: Groundwater Basin Sizes

Groundwater Basin	Basin Size (Acres)
Alexander Valley	31,000
Castro Valley	1,800
Clayton Valley	17,800
Downtown	7,600
Gilroy-Hollister Valley	178,400
Half Moon Bay Terrace	9,200
Islais Valley	5,900
Kenwood Valley	5,100
Livermore Valley	69,600
Lobos	2,400
Marina	2,200
Napa-Sonoma Valley	131,100
Novato Valley	20,500
Petaluma Valley	46,700
Pittsburg Plain	11,600
Sacramento Valley	3,795,600
San Joaquin Valley	8,745,200
San Pedro Valley	710
San Ramon Valley	7,100
San Rafael Valley	880
Santa Clara Valley	364,000
Santa Rosa Valley	105,800
South San Francisco	2,200
Suisun-Fairfield Valley	133,600
Sunol Valley	16,600
Visitacion Valley	5,800
Westside	25,400
Wilson Grove Formation Highlands	63,800
Ygnacio Valley	15,500

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).

Source: DWR 2018.

Groundwater is used for numerous purposes, including municipal and industrial water supply, in the Bay Area; however, it accounts for only about 20% of total water consumption (San Francisco Bay RWQCB 2022). Although some of the larger basins (such as Santa Clara Valley, Napa-Sonoma Valley, and Petaluma Valley) can produce large volumes of groundwater and generally have good water quality, many of the groundwater basins in the Bay Area are relatively thin and yield less water. Further, portions of the Bay Area have poor water quality as a result of past industrial uses or intrusion of brackish bay water. Because of water quality and available resources, water supply for much of the Bay Area is provided by imported water supplies through water conveyance facilities, such as the Hetch Hetchy Aqueduct, the Mokelumne Aqueduct, and the North and South Bay Aqueduct. A detailed discussion of water supply is included in Section 3.14, "Public Utilities and Facilities."

SURFACE WATER QUALITY

The quality of surface water resources in the Bay Area varies considerably and is locally affected by point-source (i.e., emitted from a single point) and nonpoint-source (i.e., diffuse) discharges. Point sources, such as wastewater treatment effluent and industrial waste discharges, are often regulated and monitored to avoid adverse effects on water quality.

Nonpoint-source pollutants are transported into surface waters through rainfall, air, and other pathways. Nonpoint-source pollutants are the leading cause of water quality degradation in the region's waterways. Stormwater runoff is estimated to contribute more heavy metals to San Francisco Bay than direct municipal and industrial dischargers, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from landscaping products and bacteria from animal waste. Most urban runoff flows untreated into creeks, lakes, and San Francisco Bay. This nonpoint-source runoff often carries pollutants, including copper from brake linings and lead from counterweights, that contribute heavy metals to local waters.

In addition, many of the region's creeks are channelized, culverted, or otherwise geomorphically altered, and the adverse effects on aquatic and riparian habitats, sediment transfer, and hydrology associated with these modifications can impair water quality. Water quality in the more rural areas of the region has also been affected by grazing and agriculture, confined animal facilities, on-site sewage systems, and land conversions. Coastal watersheds have been impaired because of sedimentation and habitat degradation. Other pollutant sources include upstream historic and current mining discharges and legacy pollutants that were historically emitted by industry or other human activities that are currently banned or have been substantially restricted. Examples include mercury, lead, polychlorinated biphenyls (PCBs), and dichlorodiphenyltrichloroethane.

The San Francisco Bay Regional Water Quality Control Board (RWQCB), the main agency charged with protecting and enhancing surface water and groundwater quality in the Bay Area, has classified the San Francisco Bay and many of its tributaries as impaired for various water quality constituents, as required by the Clean Water Act (CWA) (see Section 3.10.2, "Regulatory Setting," below). The San Francisco Bay RWQCB implements the Total Maximum Daily Load (TMDL) Program for impaired water bodies, which involves determining a safe level of loading for each problem pollutant, determining the pollutant sources, allocating loads to all of the sources, and implementing the load allocations. Within the Bay Area region, the 2024 303(d) list (applied to impaired water bodies, as defined below in the "Regulatory Setting" discussion) includes 476 listings for 193 water bodies for which a TMDL is required (San Francisco Bay RWQCB 2024a). Primary pollutants for which a TMDL has been established on Bay Area surface waters include diazinon (a pesticide), PCBs, metals (e.g., mercury and selenium), and indicator bacteria. RWQCB staff are currently developing more than 30 TMDL projects to address more than 160 listings for water bodies impaired by specific pollutants (San Francisco Bay RWQCB 2024b).

The following TMDL projects have been completed in the Bay Area (the managed pollutant follows name of water body) (San Francisco Bay RWQCB 2024c):

- Guadalupe River Watershed – Mercury;
- Lagunitas Creek – Sediment;
- Napa River – Nutrients, Sediment, and Pathogens;
- North San Francisco Bay – Selenium;
- Pescadero/Butano Creeks – Sediment;
- Petaluma River – Bacteria;
- Pillar Point Harbor and Venice Beach – Bacteria;
- Richardson Bay – Pathogens;
- San Francisco Bay Beaches – Bacteria;
- San Francisco Bay – Mercury and PCBs;
- San Gregorio Creek -Sediment;
- San Vicente Creek and Fitzgerald Marine Reserve – Bacteria;
- San Pedro Creek and Pacifica State Beach – Bacteria;
- Sonoma Creek – Nutrients, Pathogens, and Sediment;
- Suisun Marsh – Mercury and Dissolved Oxygen;
- Tomales Bay – Mercury and Pathogens;
- Urban Creeks – Pesticide Toxicity; and
- Walker Creek – Mercury.

The following TMDL projects are in development in the Bay Area (the managed pollutant follows name of water body) (San Francisco Bay RWQCB 2024c):

- San Mateo County Bay Beaches – Bacteria,
- Permanente Creek – Selenium,
- San Francisquito Creek – Sediment, and
- Stevens Creek – Toxicity.

TMDLs account for all pollutant sources, including discharges from wastewater treatment facilities; runoff from homes, agriculture, and streets or highways; “toxic hot spots”; and deposition from the air. The specific urban runoff best management practices (BMPs) and levels of implementation are determined through TMDL development. Note that one TMDL may address multiple listings. For example, the Diazinon/Pesticide Toxicity TMDL for urban creeks addressed more than 30 impaired creeks or creek segments in the Bay Area (San Francisco Bay RWQCB 2024d).

FLOOD HAZARDS

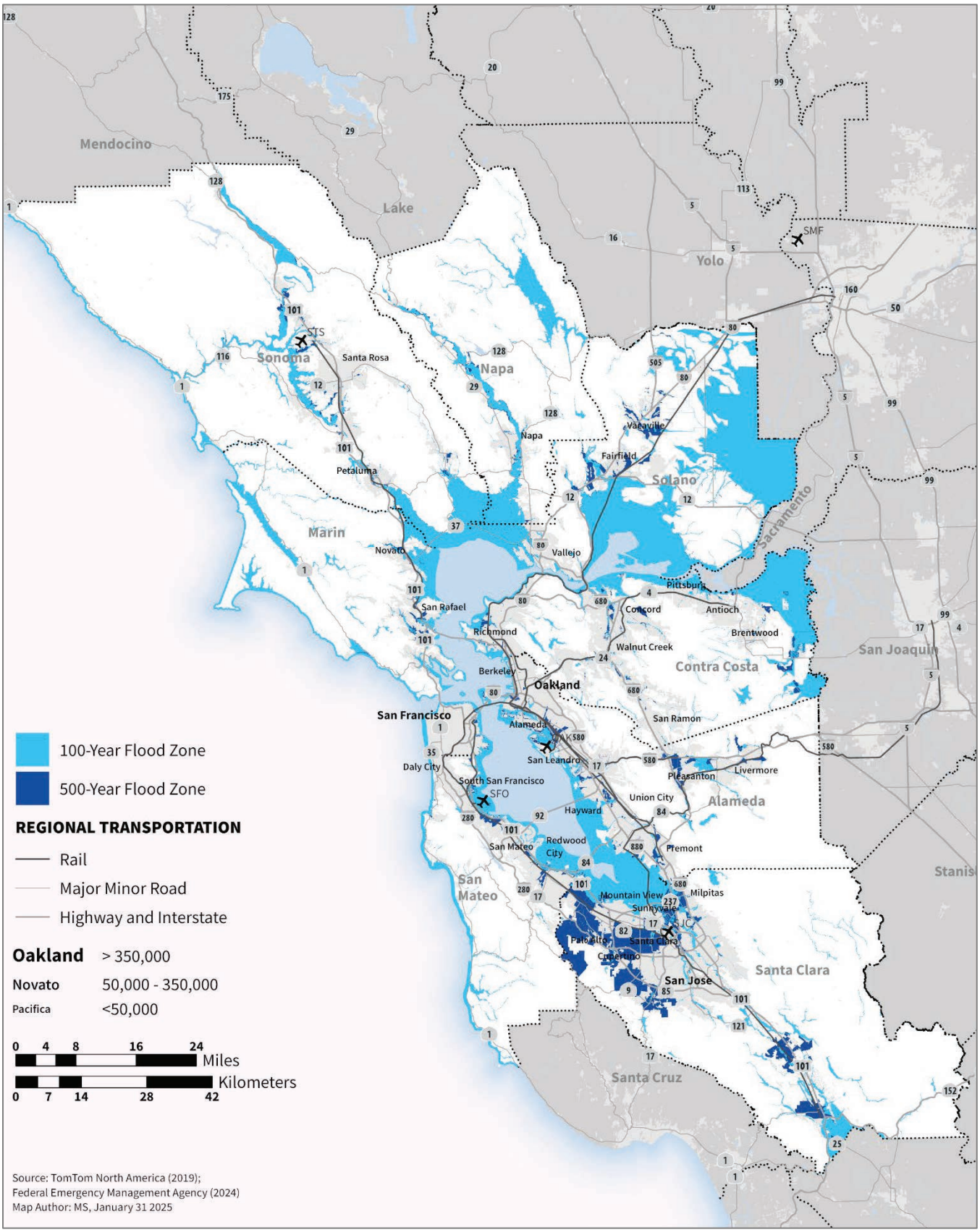
The San Francisco Bay contains many flat, low-lying marginal areas and highly developed valleys with surrounding steep terrain that are conducive to flooding, especially during intense storms. Urban areas can flood when storm drains and small channels become blocked or surcharged during intense short-duration storms. Valley flooding tends to occur when large, widespread storms fall on previously saturated watersheds that drain into the valley. The greatest flood damages occur in the lower reaches of streams when floodwaters spill onto the floodplain and spread through urban neighborhoods (DWR 2013). Because of the topography of alluvial plains, floodwaters escaping some stream channels may flow away from the flooding stream, crossing open areas or flowing through city streets until they reach an adjacent watercourse. This type of flooding compounds and exacerbates local flooding that occurs when storm drains and small channels become blocked or surcharged during storms. In addition, hillsides denuded by wildfires can exacerbate flood damages by intercepting less precipitation and generating more runoff containing massive sediment loads. Storm surges coincident with high tides can also create severe flooding in low-lying areas by the mouths of rivers (DWR 2013).

Major floods occur regularly in the Bay Area, and local structural flood damage reduction measures, such as reservoirs, levees, and channel improvements, have been implemented. Two reservoirs in the region have a designated flood protection function: Lake Del Valle and Cull Canyon Reservoir with 38,000 and 310 acre-feet of flood control capacity, respectively. Lake Del Valle is a State Water Project facility that protects Pleasanton, Fremont, Niles, and Union City. Alameda County Flood Control and Water Conservation District constructed Cull Canyon Reservoir to protect Castro Valley. Channel improvement projects designed to reduce stream flooding include channel construction, enlargement, realignment, lining, stabilization, and bank protection (DWR 2013). Flood protection agencies have constructed infrastructure projects along the following waterways to reduce the impacts of flooding (Alameda County Water District et al. 2019):

- Alameda Creek,
- Corte Madera Creek,
- Guadalupe River,
- Napa River,
- Novato Creek,
- Petaluma River, and
- San Francisquito Creek.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP). The program provides subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA issues Flood Insurance Rate Maps for communities participating in the NFIP. **Figure 3.10-2** identifies federally designated 100-year and 500-year storm event flood hazard zones in the Bay Area.

Figure 3.10-2: Flood Hazard Areas



Sources: TomTom North America 2019; FEMA 2024.

FEMA further classifies high-risk flood hazard zones for communities that participate in the NFIP where mandatory flood insurance purchase requirements apply, as shown in **Table 3.10-3**.

Table 3.10-3: Flood Hazard Zone Classification

Zone	Description
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk because of the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
High Risk Coastal Areas	
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE, V1–V30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

Notes: BFE = base flood elevation; FIRM = Flood Insurance Rate Map.

Dam Failure

The California Department of Water Resources (DWR) Division of Safety of Dams (DSOD) oversees the design, construction, and annual inspection of dams statewide. DSOD imposes strict standards for the design, maintenance, and monitoring of dams under its jurisdiction to ensure that they meet static and seismic standards to prevent catastrophic failure. Periodically, some of these dams will receive modifications, such as the San Pablo Dam, which has undergone a seismic upgrade to increase its stability and minimize the potential for liquefaction to cause any slump or failure of the embankment. Since 1916 there have been seven dam failures statewide. The most recent was in 1971 with the failure of the San Fernando dam near Los Angeles (ASDSO 2024). A partial failure of a spillway gate at Folsom Lake Dam occurred in 1995, and a partial failure of a spillway gate at Oroville Dam occurred in 2017. Based on these statistics, dam failure is a relatively low likelihood event.

Seiches and Tsunamis

A tsunami is a series of waves generated in a body of water by a rapid disturbance (e.g., submarine seismic, volcanic, or landslide event) that vertically displaces water. Tsunamis affecting the Bay Area can result from offshore earthquakes within the Bay Area or from distant events. While it is most common for tsunamis to be generated by subduction faults, such as those in Washington and Alaska, local tsunamis can be generated from strike-slip faults (such as the small one that was triggered by the 1906 San Andreas earthquake). In general, a tsunami can move hundreds of miles per hour in the open ocean and reach land with waves as high as 100 feet or more. More than 71 tsunamis have been recorded or observed within the San Francisco Bay since 1854 (Varner and Allen-Price 2017). Of these, the 1964 Alaska earthquake triggered by a 9.2 magnitude earthquake caused the most damage in San Francisco Bay. That wave was just under 4 feet in height and damage was limited to marinas and private boats in Marin County. The geography of the bay reduces the risk of a large tsunami event. A seismic event on the Cascadia subduction zone, which runs roughly from Mendocino County to Vancouver Island and is considered a worst-case scenario for tsunami in the bay, is estimated take several hours to reach the City of San Francisco, providing time to mobilize a response (Varner and Allen-Price 2017). ABAG has mapped portions of the plan area within tsunami inundation areas for emergency planning (see **Figure 3.10-3**).

Seiches are oscillations of enclosed and semi-enclosed bodies of water, such as bays, lakes, or reservoirs, caused by strong ground motion from seismic events, wind stress, volcanic eruptions, large landslides, and local basin reflection of tsunamis. Seiches can result in creation of long-period waves that can cause water to overtop containment features or run-up on adjacent landmasses.

3.10.2 Regulatory Setting

FEDERAL REGULATIONS

Clean Water Act

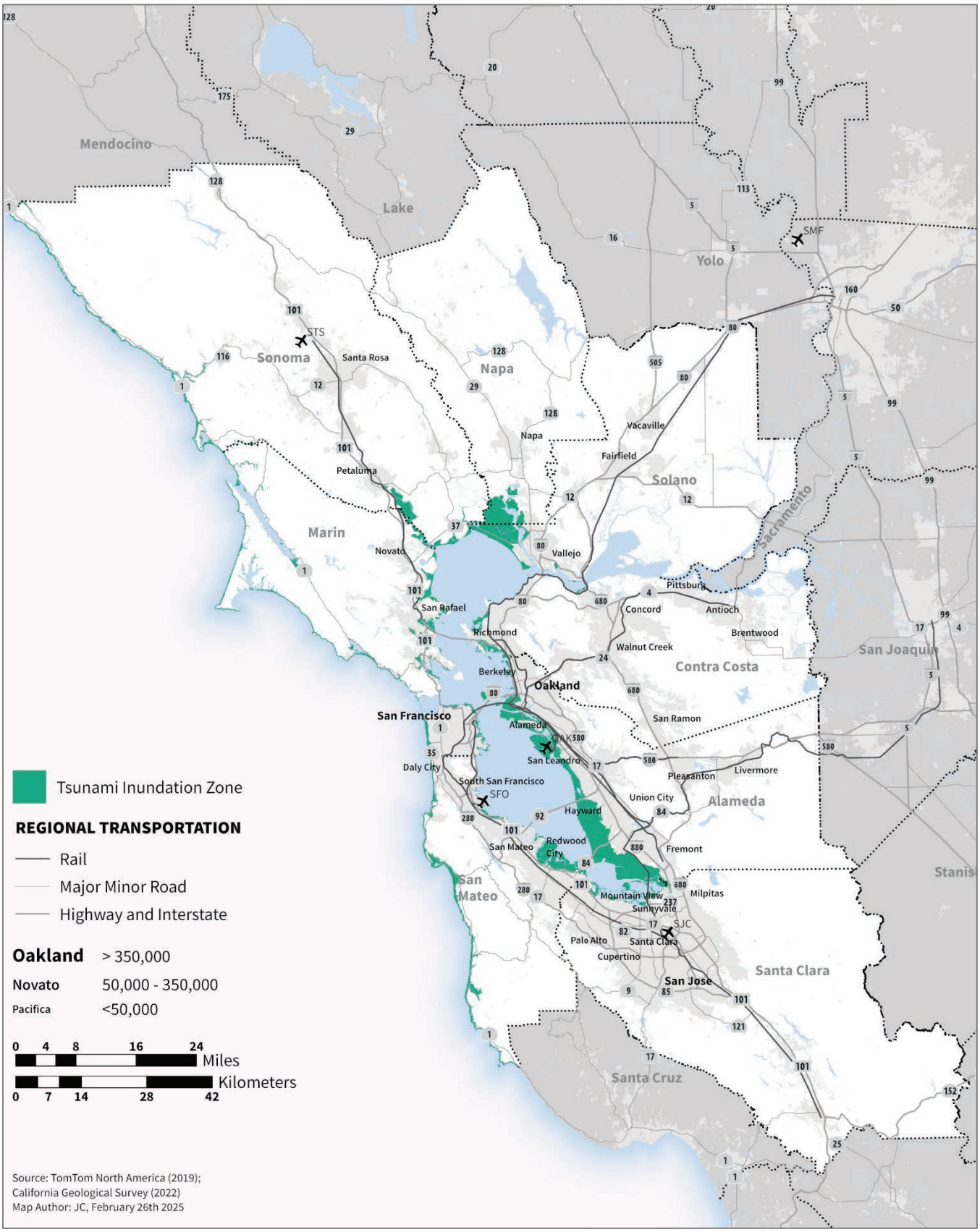
The CWA establishes the basic structure for regulating discharges of pollutants into "waters of the United States." It specifies a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Some of these tools include:

- Section 303(d) – TMDLs,
- Section 401 – Water Quality Certification,
- Section 402 – National Pollutant Discharge Elimination System (NPDES) Program, and
- Section 404 – Discharge of Dredged or Fill Material.

In 2000, the US Environmental Protection Agency (EPA) established the California Toxics Rule, which sets water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

Section 303(d) requires states, territories, and authorized tribes to develop a list of water quality–limited segments of rivers and other water bodies under their jurisdiction. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the list and develop action plans to improve water quality. These are action plans designed to improve the quality of water resources. As part of the TMDL process, municipalities must examine the water quality problems and identify sources of pollutants to create specific actions designed to improve water quality.

Figure 3.10-3: Tsunami Inundation Zones



Sources: TomTom North America 2019; USGS 2022.

Section 401 requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain a water quality certification that the proposed activity will comply with applicable water quality standards.

Section 402 regulates point-source discharges to surface waters through the NPDES program. In California, the State Water Resources Control Board (SWRCB) oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. It covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers 10 categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. For further discussion of the NPDES program's regulation of municipal separate storm sewer systems, refer to Section 3.14, "Public Utilities and Facilities." Permits for construction activities, also administered by SWRCB, are discussed below.

Section 402(p) of the federal CWA, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, EPA published regulations (CFR Title 40, Part 122) that prescribe permit application requirements for MS4s pursuant to CWA Section 402(p). On May 17, 1996, EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for postconstruction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low-impact development (LID) techniques.

Section 404 establishes a permit program, administered by the US Army Corps of Engineers (USACE), to regulate the discharge of dredged or fill materials into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. CWA Section 404 permits are issued by USACE.

Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by USACE, requires permits for all structures (such as riprap) and activities (such as dredging) in navigable waters of the United States.

Coastal Zone Act Reauthorization Amendments

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) require coastal states to have a Coastal Nonpoint Pollution Control Program. CZARA provides state coastal management agencies regulatory control (federal consistency review authority) over all federal activities and federally licensed, permitted, or assisted activities. Additionally, CZARA requires implementation of 56 management measures to achieve and maintain water quality standards, enforceable policies and mechanisms, and monitoring and tracking of management measure implementation.

National Flood Insurance Act

The US Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for the NFIP. The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief. The NFIP is a federal program administered by the Flood Insurance Administration of FEMA. It enables individuals who have property (a building or its contents) within the 100-year floodplain to purchase insurance against flood losses. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas. Floodplain mapping is an ongoing process in the Bay Area, and flood maps must be regularly updated for both major rivers and tributaries as land uses and development patterns change.

Executive Order 11988 - Floodplain Management

Executive Order 11988 directs federal agencies to avoid, to the extent practicable and feasible, short- and long-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Further, this executive order requires the prevention of uneconomic, hazardous, or incompatible use of floodplains; protection and preservation of the natural and beneficial floodplain values; and consistency with the standards and criteria of the NFIP.

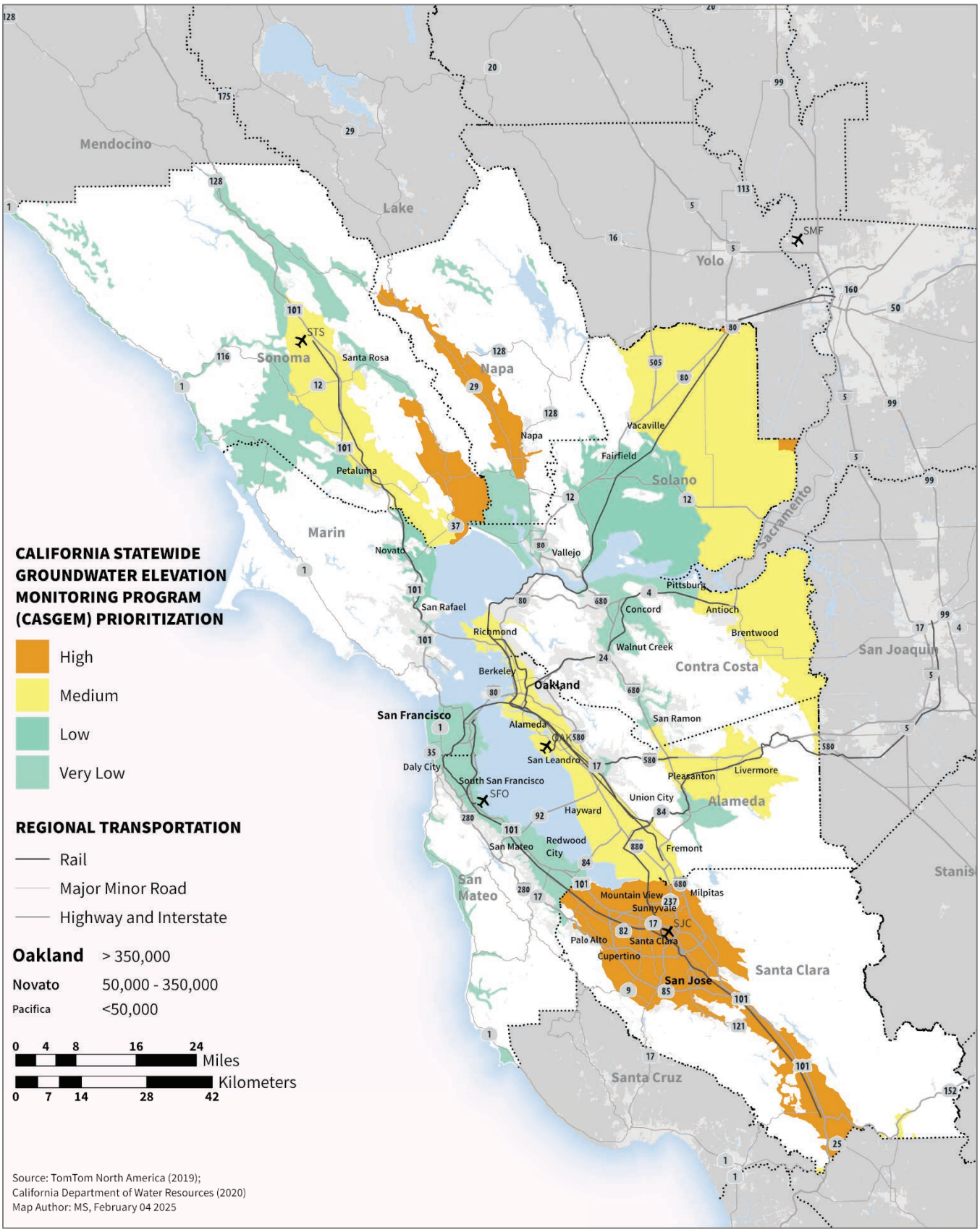
STATE REGULATIONS

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) was enacted in September of 2014. Pursuant to SGMA, sustainable groundwater management is the management and use of groundwater in a manner that can be maintained during a 50-year planning and implementation horizon without causing undesirable results. SGMA establishes a new structure for locally managing California's groundwater and includes the following key elements:

- provides for the establishment of a Groundwater Sustainability Agency (GSA) by one or more local agencies overlying a designated groundwater basin or subbasin, as established by DWR Bulletin 118-03;
- requires all groundwater basins found to be of "high" or "medium" priority to prepare Groundwater Sustainability Plans (GSPs) or submit an alternative to a GSP that demonstrates how water managers have already achieved or will achieve sustainable groundwater management. Sonoma, Napa, Solano, Contra Costa, Alameda, and Santa Clara Counties include basins designated as high or medium priority (see **Figure 3.10-4**);
- provides for the proposed revisions, by local agencies, to the boundaries of a DWR Bulletin 118 basin, including the establishment of new subbasins;
- provides authority for DWR to adopt regulations to evaluate GSPs and review the GSPs for compliance every 5 years;
- requires DWR to establish BMPs and technical measures for GSAs to develop and implement GSPs; and
- provides regulatory authorities for SWRCB for developing and implementing interim groundwater monitoring programs under certain circumstances (such as lack of compliance with development of GSPs by GSAs).
- The medium and high priority basins in the plan area are developing GSPs or have submitted alternative plans to comply with SGMA (**Table 3.10-4**).

Figure 3.10-4: Groundwater Basin Prioritization



Sources: Figure provided by MTC and ABAG, adopted by Ascent in 2025.

Table 3.10-4: Groundwater Sustainability Plan Status of High and Medium Priority Basins in the Plan Area

Groundwater Basin Name (Basin Number)	County	SGMA Basin Prioritization	Groundwater Sustainability Plan Status
Santa Rosa Valley - Santa Rosa Plain (1-055.01)	Sonoma	Medium	Approved by DWR in January 2023.
Petaluma Valley (2-001)	Sonoma	Medium	Approved by DWR in January 2023.
Napa-Sonoma Valley - Sonoma Valley (2-002.02)	Sonoma	High	Approved by DWR in January 2023.
Napa-Sonoma Valley - Napa Valley (2-002.01)	Napa	High	Approved by DWR in January 2023.
Sacramento Valley - Solano (5-021.66)	Solano	Medium	Approved by DWR in January 2024.
Sacramento Valley - Yolo (5-021.67)	Solano	High	Approved by DWR in October 2023.
San Joaquin Valley - East Contra Costa (5-022.19)	Contra Costa	Medium	Approved by DWR in July 2023.
Santa Clara Valley - East Bay Plain (2-009.04)	Contra Costa/Alameda	Medium	Approved by DWR in July 2023.
Santa Clara Valley - Niles Cone (2-009.01)	Alameda	Medium	Alternative plan approved by DWR in June 2024.
Livermore Valley (2-010)	Alameda	Medium	Alternative plan approved in June 2024.
Gilroy-Hollister Valley - North San Benito (3-003.05)	Santa Clara	Medium	Approved by DWR in July 2023.
Gilroy-Hollister Valley - Llagas Area (3-003.01)	Santa Clara	High	Alternative plan approved in June 2024.
Santa Clara Valley - Santa Clara (2-009.02)	Santa Clara	High	Alternative plan approved in June 2024.

Notes: SGMA = Sustainable Groundwater Management Act; DWR = California Department of Water Resources.
Sources: DWR 2024a, 2024b, n.d.; compiled by MTC and ABAG in 2024.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) established SWRCB and divided the State into nine regions, each overseen by an RWQCB. The nine regional boards have the primary responsibility for the coordination and control of water quality within their respective jurisdictional boundaries. Under the Porter-Cologne Act, water quality objectives are limits or levels of water quality constituents or characteristics established for the purpose of protecting beneficial uses. Each RWQCB must develop, adopt, and implement a Water Quality Control Plan (Basin Plan) for its region. RWQCBs must establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Designated beneficial uses, together with the corresponding water quality objectives, also constitute water quality standards under the federal CWA. Therefore, the water quality objectives form the regulatory references for meeting State and federal requirements for water quality control.

SWRCB also has adopted several statewide Water Quality Control Plans, including the Bay-Delta Plan. SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary in 2018. The amendments established water quality objectives to maintain Bay-Delta ecosystem health. SWRCB is considering possible updates to the Bay-Delta Plan that would be needed for a proposed voluntary agreement for the Tuolumne River (San Francisco Bay RWQCB 2025).

The Porter-Cologne Act authorizes the State to develop approaches to address nonpoint source pollution and requires preparation of plans that identify approaches to achieve water quality targets (e.g., TMDL load allocations). Pursuant to the CWA NPDES program, the RWQCB also issues permits for point-source discharges that must meet the water quality objectives and must protect the beneficial uses defined in the Basin Plan.

Antidegradation Policy

California's antidegradation policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Waters in California (SWRCB Resolution No. 68-16), restricts degradation of surface water and groundwater. It protects waters where existing quality is higher than necessary for the protection of beneficial uses. Any actions with the potential to adversely affect water quality must (1) be consistent with maximum benefit to the people of the State, (2) not unreasonably affect present and anticipated beneficial use of the water, and (3) not result in water quality less than that prescribed in water quality plans and policies. Any actions that can adversely affect surface waters are also subject to the federal antidegradation policy (40 CFR Section 131.12) developed under the CWA.

Construction General Permit

The California Construction Stormwater Permit (Construction General Permit)[1], adopted by SWRCB, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least 1 acre of total land area. The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. It prohibits the discharge of materials other than stormwater and all discharges that contain a hazardous substance in excess of reportable quantities established in Title 40, Section 117.3 or 302.4 of the CFR, unless a separate NPDES permit has been issued to regulate those discharges.

The Construction General Permit requires that all developers of land where construction activities will occur over more than 1 acre do the following:

- complete a risk assessment to determine pollution prevention requirements pursuant to the three risk levels established in the General Permit,
- eliminate or reduce nonstormwater discharges to storm sewer systems and other waters of the nation,
- develop and implement a stormwater pollution prevention plan (SWPPP) that specifies BMPs that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards, and
- perform inspections and maintenance of all BMPs.

To obtain coverage under the NPDES Construction General Permit, the legally responsible person must electronically file all permit registration documents with SWRCB before the start of construction. Permit registration documents must include:

- Notice of Intent,
- risk assessment,
- site map,

[1] *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities,* Order No. 2009- 0009-DWQ, as amended by Order No. 2010-0014-DWQ, National Pollutant Discharge Elimination System No. CAS000002.

- SWPPP,
- annual fee, and
- signed certification statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address postconstruction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

California's Nonpoint Source Pollution Control Program

The *2020–2025 Nonpoint Source Program Implementation Plan* was prepared by SWRCB, the RWQCBs, and the California Coastal Commission, collectively, the colead agencies. The goal of this 5-year plan is to present, in one place, the general goals and objectives of the colead agencies for addressing nonpoint source pollution over the timeframe of January 2021 to June 2025. This plan was also prepared to meet CWA Section 319 requirements and to implement Section 6217 of CZARA.

California Coastal Commission goals set in the plan include ensuring that coastal development projects for which the commission is the permitting authority, and local governments' coastal planning documents (e.g., new or updated Local Coastal Programs, Long Range Development Plans, and Port Master Plans), implement appropriate management measures and BMPs to protect and restore coastal waters.

California Green Building Standards Code

Chapters 4 and 5 of the California Green Building Standards Code (CALGreen) include mandatory measures for residential and nonresidential development, respectively. Section 4.106.2 requires residential projects that disturb less than 1 acre and are not part of a larger common plan of development to manage stormwater drainage during construction through use of on-site retention basins, filtration systems where stormwater is conveyed to a public drainage system, and/or compliance with a stormwater management ordinance. Section 5.106.1 requires newly constructed nonresidential projects and additions of less than 1 acre to prevent the pollution of stormwater runoff because of construction through compliance with a local ordinance or by implementing BMPs that address soil loss and good housekeeping to manage equipment, materials, and wastes.

California Department of Transportation NPDES Permit

In June 2022, SWRCB adopted the Statewide Stormwater Permit and Time Schedule Order for the California Department of Transportation (Caltrans). This permit regulates non-stormwater and stormwater discharges from Caltrans's MS4 and from Caltrans-owned right of way, parking, storage, and maintenance facilities. The Caltrans permit requires development of a program for communication with local agencies, and coordination with other MS4 programs where those programs overlap geographically with Caltrans facilities. As part of the permit, Caltrans is required to maintain and implement a Stormwater Management Plan (SWMP) that is used to outline the regulation of pollutant discharge caused by current and future construction and maintenance activities. SWMP requirements apply to discharges from Caltrans stormwater conveyances, including catch basins and drain inlets, curbs, gutters, ditches, channels, and storm drains. The SWMP applies to discharges consisting of stormwater and nonstormwater resulting from:

- maintenance and operation of State-owned highways, freeways, and roads;
- maintenance facilities;
- other facilities with activities that have the potential for discharging pollutants;

- permanent discharges from subsurface dewatering;
- temporary dewatering; and
- construction activities.

The discharges addressed by the SWMP flow through municipal stormwater conveyance systems or flow directly to surface water bodies in the State. These surface water bodies include creeks, rivers, reservoirs, lakes, wetlands, lagoons, estuaries, bays, and the Pacific Ocean and tributaries.

This SWMP applies to the oversight of activities performed by outside agencies or non-Caltrans entities (third parties) within Caltrans' MS4 to ensure compliance with stormwater regulations. Non-Caltrans activities include highway construction and road improvement projects, as well as residential use and business operations on leased property.

The SWMP must be approved by SWRCB, and as specified in the permit, it is an enforceable document. Compliance with the permit is measured by implementation of the SWMP. Caltrans' policies, manuals, and other guidance related to stormwater are intended to facilitate implementation of the SWMP. Caltrans also requires all contractors to prepare and implement a program to control water pollution effectively during the construction of all projects. Caltrans projects must also meet the requirements in the Caltrans San Francisco Bay Trash Work Plan to meet San Francisco Bay Regional Water Quality Control Board Cease and Desist Order No. R2-2019-0007. Caltrans continues to modify its policies and procedures to be consistent with the SWRCB's General Construction Permit, described above.

California Department of Transportation Highway Design Manual

The Highway Design Manual was prepared for use on the California State highway system. The manual establishes uniform policies and procedures to inform and guide Caltrans employees. Chapter 870 includes standards for bank protection and erosion control, Chapter 880 provides shore protection standards, and Chapter 890 relates to stormwater management.

California Department of Transportation Project Planning and Design Guide

The Project Planning and Design Guide provides guidance on the process and procedures for evaluating project scope and site conditions to determine the need for and feasibility of incorporating BMPs into projects within Caltrans right-of-way. It provides design guidance for incorporating those stormwater quality controls into projects during the planning and project development process. The Project Planning and Design Guide was prepared in support of the Statewide Stormwater Management Plan. The document addresses key regulatory, policy, and technical requirements by providing direction on the procedures to incorporate stormwater BMPs into the design of all Caltrans projects. Construction projects within Caltrans' right-of-way that would disturb less than 1 acre of soil would be subject to Caltrans' Project Planning and Design Guide requirement to implement a Water Pollution Control Plan.

California Stormwater Quality Association Best Management Practices Handbooks

The California Stormwater Quality Association (CASQA) is a professional member association dedicated to the advancement of stormwater quality management through collaboration, education, implementation guidance, regulatory review, and scientific assessment. CASQA's membership is composed of a diverse range of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout the State. CASQA develops and publishes four BMP handbooks. The Development BMP Handbook provides guidance on developing project-specific SWMPs, including selection and implementation of BMPs, for a particular development or redevelopment project.

Cobey-Alquist Floodplain Management Act

The Cobey-Alquist Floodplain Management Act (California Water Code 8400–8415) and Executive Order B-39-77 give support to the NFIP. The act encourages local governments to plan, adopt, and enforce land use regulations for floodplain management in order to protect people and property from flooding hazards. It also identifies requirements that jurisdictions must meet to receive State financial assistance for flood control. Executive Order B-39-77 requires State agency compliance with good floodplain management practices.

California Fish and Game Code

The California Department of Fish and Wildlife is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify the agency of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, State or local government agency, or public utility that proposes an activity that would:

- substantially divert or obstruct the natural flow of any river, stream, or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the floodplain of a body of water.

Ocean Standards

SWRCB's ocean standards protect the beneficial uses of California's marine waters through establishing water quality objectives and implementation provisions in statewide water quality control plans and policies. Ocean standards plans and policies include the Water Quality Control Plan for Ocean Waters of California, the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California, and the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling.

California Ocean Plan

To protect the quality of ocean waters for use and enjoyment by the people of the State, SWRCB requires control of the discharge of waste to ocean waters and control of intake of seawater through the California Ocean Plan. The plan is reviewed at least every 3 years to guarantee that the current standards are adequate and are not allowing degradation to marine species or posing a threat to public health. This plan is applicable, in its entirety, to point source discharges to the ocean. This plan is not applicable to discharges to enclosed bays and estuaries or inland waters or the control of dredged material.

California Coastal Act

The California Coastal Act is intended to protect California's coastal resources. The California Coastal Commission works to ensure that all nonexempt development along the California coast undergoes the act's independent permit review process and secures the required Coastal Development Permit. The Coastal Commission's Water Quality Program works to integrate effective nonpoint source water quality protection measures into coastal development projects and local governments' land use planning documents, in accordance with Coastal Act requirements. In coordination with other agencies, staff also provide educational and technical assistance to address development activities that may affect coastal resources by generating polluted runoff or changes in runoff flows.

Section 30231 of the act provides for protection of coastal watersheds through implementation of management measures and BMPs, including minimizing adverse effects of discharges, controlling runoff, minimizing hydromodification and stream alterations, and maintaining natural vegetation buffers. Section 30253 provides the commission with the authority to control development that contributes to flooding, erosion, and surface alterations in and around the development site. It also gives the commission the ability to limit development activities that are sited in highly erodible areas with steep slopes and unstable soils or that accelerate the volume or rate of runoff from a site, thus affecting downstream habitats and structures.

Senate Bill 272

California Senate Bill (SB) 272, "Sea Level Rise Planning and Adaptation," was signed into law on October 7, 2023. SB 272 requires local governments that are within or partially within the state's coastal zone or the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), respectively, to develop Local Coastal Programs or Subregional Shoreline Adaptation Plans. SB 272 requires BCDC to create guidelines for the preparation of these plans within the San Francisco Bay Area and gives BCDC the authority to approve or deny plans based on consistency with these guidelines. Local governments that receive approval from the Coastal Commission or BCDC will be prioritized for funding for the implementation of sea level rise adaptation strategies and recommended projects in the approved plan. These plans are intended to be used by cities and counties to protect their residents, neighborhoods, communities, infrastructure, and habitats from sea level rise on the bay shoreline and on the outer coast.

REGIONAL AND LOCAL REGULATIONS

McAteer-Petris Act/San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. It established the BCDC as the agency charged with preparing a plan for the long-term use of the bay and regulating development in and around the bay while the plan was being prepared. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the bay plan into State law. The bay plan has two features: policies to guide future uses of the bay and shoreline, and maps that apply these policies to the bay and shoreline.

The BCDC Regional Shoreline Adaptation Plan (RSAP) was developed in response to SB 272 (described under "State Regulations" above) and is a component of the San Francisco Bay Plan. The RSAP is a guidance document that supports the Bay Area's local governments and communities in addressing the risks of coastal flood hazards through coordinated and consistent adaptation planning and implementation. The RSAP includes guidelines that promote safe, sustainable, and strategic shoreline growth and density in areas that are resilient to coastal sea level rise and inland groundwater rise (BCDC 2024).

Bay Area Stormwater Management Agencies Association

The Bay Area Stormwater Management Agencies Association (BASMAA) is a consortium of the following nine San Francisco Bay Area municipal stormwater programs: Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, Fairfield-Suisun Urban Runoff Management Program, Marin County Stormwater Pollution Prevention Program, Napa Countywide Stormwater Pollution Prevention Program, San Mateo Countywide Water Pollution Prevention Program, Santa Clara Valley Urban Runoff Pollution Prevention Program, Sonoma County Water Agency, and Vallejo Sanitation and Flood Control District. BASMAA was started in an effort to promote regional consistency and to facilitate efficient use of public resources. BASMAA has prepared *BASMAA Post-Construction Manual Design Guidance for*

Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties (BASMAA 2014), which is a LID approach to implementing Provision E.12 of the Phase II Small MS4 General Permit.

Flood Planning

Many agencies in the region have performed some level of flood planning. The city of Napa has a system of road closures based on the stage of the Napa River that reduces the risk to individuals and property in the event of flooding. The Contra Costa Resource Conservation District has a watershed management plan for Alhambra Creek that discusses a myriad of options to reduce the risk of flooding in Martinez and surrounding areas. The Bay Area Flood Protection Agencies Association is a consortium of flood control and water agencies in the region that provides a forum for discussing flood issues, collaborating on multiagency projects, and sharing resources.

All local jurisdictions regulate development within floodplains. Construction standards are established within local ordinances and planning elements to reduce flood impedance, safety risks, and property damage.

Dam Inundation

Counties are required by State regulation to map potential dam inundation areas and prepare emergency plans and procedures for preparing for and responding to a dam breach as part of their multihazard mitigation plans (Title 19 CCR Section 2575). Additionally, the Federal Energy Regulatory Commission is required to approve local emergency action plans for dams with the potential to cause massive damage. Emergency action plans outline notification procedures for people and property owners within a potential inundation area. Because of the large number of dams within the plan area, many of the proposed development areas would likely be located within one or more inundation areas. There is no policy or regulatory requirement restricting development within potential dam inundation areas largely because of the continued maintenance and oversight, which results in a relatively low risk for damage or injury.

City and County General Plans

Of the seven required general plan elements, the conservation, open space, and safety elements are the most relevant to hydrology and water quality. The conservation element typically addresses watershed protection; land or water reclamation; prevention or control of the pollution of streams and other coastal waters; and regulation of land uses along stream channels and in other areas required to implement the conservation plan (e.g., buffer areas), control or correct soil erosion, and provide flood control. The open space element applies to the preservation of natural resources, including fish and wildlife habitat, rivers, streams, bays and estuaries, and open space. The safety element applies to the potential risk of death, injuries, property damage, and economic and social dislocation resulting from floods and other hazards.

Government Code Section 65302, as amended, requires that on or after January 1, 2009, the updated safety elements of general plans must incorporate significantly enhanced geographic data, goals, and policies related to flood hazards. This enhanced assessment of flood hazards must include flood mapping information from multiple agencies including FEMA, USACE the Office of Emergency Services, DWR, and any applicable regional dam, levee, or flood protection agencies; historical data on flooding; an inventory of existing and planned development (including transportation infrastructure) in flood zones; and new policies that comprehensively address existing and future flood risk in the planning area.

3.10.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality (Criterion HYDRO-1);
- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin (Criterion HYDRO-2);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site, or provide substantial additional sources of polluted runoff (Criterion HYDRO-3);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site (Criterion HYDRO-4);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows (Criterion HYDRO-5); or
- in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation (Criterion HYDRO-6).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on water resources based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of water resources throughout the Bay Area. Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county).

The baseline for the following analysis is the Notice of Preparation, released in January 2025. The analysis compares the general location of the projected land use growth footprint, sea level rise adaptation projects, and transportation projects to existing resources, such as 303(d)-listed water bodies, groundwater basins, flood hazard areas, levees, dam inundation areas, and seiche zones, and describes how the subsequent projects would be subject to existing federal, State, and local laws, regulations, and plans that are in place to avoid adverse changes in existing hydrology and avoid or substantially lessen contaminants within stormwater and nonstormwater flows and within surface waters and groundwaters in the plan area.

For this impact assessment, a geographic information system (GIS) was used to digitally overlay the proposed plan's forecasted development pattern associated with the land use growth footprint, sea level

rise adaptation projects footprint, and transportation projects footprint over resource-related data. See Section 3.1, "Approach to the Analysis," for additional details regarding the GIS modeling for this analysis.

Effects on area hydrology could occur where projects substantially alter stormwater drainage, groundwater recharge, or potential for flooding. Effects on water quality could result from increases in erosion and other non-point-source pollutants at levels exceeding established regulatory thresholds. This evaluation of hydrology and water quality impacts assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. For additional information on analysis methodology, refer to Section 3.1.3, "General Methodology and Assumptions."

IMPACTS AND MITIGATION MEASURES

Impact HYDRO-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality (LTS)

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050 the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that would result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. Implementation of the proposed plan would include transportation projects that would maintain and optimize the existing transportation system, create healthy and safe streets, and build a next-generation transit network. Sea level rise adaptation projects could result in the construction of levees, seawalls, elevated roadways, marsh restoration projects, and tidal gates.

Land Use Impacts

Construction

Accommodation of anticipated growth in the plan area would require construction and operation of new residential and nonresidential development. Construction would result in ground disturbance that can result in erosion and sedimentation with potential to adversely affect water quality. Development activities associated with implementation of the proposed plan would also temporarily increase the use of potentially hazardous materials and petroleum products commonly used in construction (e.g., diesel fuel, lubricants, paints and solvents, and cement products containing strong basic or acidic chemicals), as evaluated in Section 3.9, "Hazards and Wildfire." Following construction, common urban pollutants associated with sustained, expanded use of household hazardous materials, herbicides and pesticides, and erosion from soil disturbance could be transported in runoff and potentially adversely affect the quality of receiving surface waters or groundwater.

The following provides an analysis of the potential for implementation of the plan to result in degradation of surface water and groundwater quality, including the potential to conflict with or obstruct implementation of a water quality control plan. The discussion is focused on potential adverse effects on surface water quality associated with discharge to waters listed under Section 303(d) of the CWA. The potential water quality implications of drainage pattern alterations and construction activities are also analyzed in Impacts HYDRO-3 (with respect to erosion) and HYDRO-4 (with respect to rates and amounts of urban runoff caused by an increase in the extent of impervious surfaces). The potential for construction

activities to encounter, and potentially spread, existing groundwater contamination is addressed in Section 3.9, "Hazards and Wildfire," in Impact HAZ-4.

The Section 402 NPDES MS4 Phase I and Phase II permits required under the CWA, which cover all jurisdictions, as well as large institutional users (as further described in the State regulatory setting discussion, above), require agencies and developments to implement SWMPs, which in turn require the implementation of source and treatment control measures. Section 402 NPDES Construction General permits require project proponents to incorporate general site design control measures into project design. These control measures may include conserving natural areas, protecting slopes and channels, and minimizing impervious areas. Treatment control measures may include use of vegetated swales and buffers, grass median strips, detention basins, wet ponds, or constructed wetlands, infiltration basins, and other measures. Filtration systems may be either mechanical (e.g., oil/water separators) or natural (e.g., bioswales and settlement ponds). Selection and implementation of these measures would occur on a project-by-project basis depending on project size and stormwater treatment needs. NPDES MS4 permittees are also required to develop and enforce ordinances and regulations to reduce the discharge of sediments and other pollutants in runoff and must verify compliance. NPDES Construction General permittees are also required to develop a SWPPP for each site that identifies BMPs to reduce potential construction impacts.

The construction contractor's Qualified SWPPP Developer would prepare the SWPPP, which would identify stormwater BMPs that minimize erosion and sedimentation that may result from temporary changes in drainage patterns, including BMPs for temporary drainage systems and temporary stream diversion and dewatering. All Qualified SWPPP Developers must be trained to ensure that SWPPPs are prepared according to the requirements of the permit. The construction contractor's Qualified SWPPP Practitioner would be responsible for implementing the SWPPP. As part of that responsibility, the effectiveness of construction BMPs would be monitored before, during, and after storm events. Records of these inspections and monitoring results would be submitted to the RWQCBs as part of the annual report required by the permit.

In addition, all projects, including those that would disturb less than 1 acre, would be subject to the CALGreen requirements related to stormwater drainage that have been designed to prevent or reduce discharges of sediments, chemicals, and wastes through BMPs that include on-site retention and filtration. Smaller projects may also be subject to additional requirements, which vary by local jurisdiction. In many cases, stormwater drainage measures and compliance with RWQCB Municipal Regional Stormwater Permit Order No. 2011-0083 Provision C.3 may be required by local jurisdictions as standard conditions of approval for building permit applications.

Typical BMPs used to meet regulatory standards, as required by CALGreen, are described below. These measures protect surface water and groundwater quality by removing or substantially lessening the amount of pollutants that flow off-site and into surface water or groundwater.

As noted under Mitigation Measure AQ-2 in in Section 3.4, "Air Quality," there are several construction best practices for addressing entrained dust. Some of these include the following (see Section 3.4 for a full list):

- Water all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) two times per day. For projects over 5 acres in size, soil moisture should be maintained at a minimum of 12%. Moisture content can be verified by lab samples or a moisture probe.
- Cover all haul trucks transporting soil, sand, or other loose material off-site.
- Cover on-site dirt piles or other stockpiled particulate matter, install wind breaks, and employ water and/or soil stabilizers to reduce wind-blown dust emissions. The use of approved nontoxic soil

stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas.

- Limit all vehicle speeds on unpaved roads and surfaces to 15 mph.
- Complete all roadway, driveway, and sidewalk paving as soon as possible. Building pads shall be paved as soon as possible after grading.
- Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- Operate all transfer processes involving a free fall of soil or other particulate matter in such a manner as to minimize the free fall distance and fugitive dust emissions.
- Wash off all trucks and equipment, including their tires, before they leave the site.
- Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible, and water it appropriately until vegetation is established.
- Store hazardous materials used on the construction sites, such as fuels and solvents, in covered containers that are protected from rainfall, runoff, and vandalism.

Construction activities associated with the proposed plan would not substantially degrade water quality in violation of water quality standards. The impact would be less than significant (LTS) because future construction associated with projected growth would adhere to existing regulations and would operate under the oversight of applicable regulatory agencies. Through these actions, it is anticipated that growth would occur without resulting in a violation of water quality standards.

Operation

As noted above, implementation of the proposed plan would result in the operation of new residential and nonresidential development. Following construction, common urban pollutants associated with sustained, expanded use of household hazardous materials, herbicides and pesticides, and erosion from soil disturbance could be transported in runoff and potentially adversely affect the quality of receiving surface waters or groundwater.

The following BMPs typically are used during operation:

- Design roadway and parking lot drainage to run through grass median strips that are contoured to provide adequate storage capacity and to provide overland flow, detention, and infiltration before runoff reaches culverts or detention basins. Oil and sediment separators or absorbent filter systems may also be installed within the storm drainage system to provide filtration of stormwater before discharge to reduce the potential for water quality impacts.
- Use integrated pest management techniques (i.e., methods that minimize the use of potentially hazardous chemicals) in landscaped areas.
- Handle, store, and apply potentially hazardous chemicals in accordance with all applicable laws and regulations.
- Implement an erosion control and revegetation program designed to allow reestablishment of native vegetation on slopes in undeveloped areas as part of the long-term sediment control plan.
- Use alternative discharge options (e.g., constructed wetland, infiltration basin, bioretention) to protect sensitive fish and wildlife populations in areas where habitat for fish and other wildlife would be threatened by facility discharge.

Under Section 303(d) of the CWA, states evaluate water quality–related data and information to develop a list of waters that do not meet established water quality standards (referred to as "impaired") and develop a TMDL for every pollutant/water body combination on the list. This includes the development of a loading capacity that is allocated among various point sources and nonpoint sources. As discussed above, the San Francisco Bay RWQCB has identified 476 listings for 193 water bodies that are classified as impaired under Section 303(d) of the CWA. Primary pollutants for which a TMDL has been established on Bay Area surface waters include diazinon (a pesticide), PCBs, metals (e.g., mercury and selenium), and indicator bacteria. RWQCB staff are currently developing more than 30 TMDL projects to address more than 160 listings for water bodies impaired by specific pollutants (San Francisco Bay RWQCB 2024b).

Permits for discharge from point sources are issued through the NPDES program. In addition, several jurisdictions in the plan area have adopted BMPs and ordinances that address runoff resulting from new development. Where TMDLs have been established, compliance with the standards (which is required through the NPDES permitting process) would substantially address the potential to contribute to existing pollution. Therefore, projects associated with forecasted land use growth footprint would not be expected to contribute to violations of water quality standards.

As noted above under "Method of Analysis," this evaluation assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist to protect water quality that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, including adopted regulatory provisions of Basin Plans. As described above, consistency with these plans would be determined at the project level and enforced through the permitting process. There is no attribute of the proposed plan that would obstruct the implementation of this process. The proposed plan would provide a guiding vision and approach for the manner in which the region could accommodate growth but would not supplant established regional plans for the protection of water quality and water supply. Individual projects would be required to demonstrate compliance with the applicable water quality or groundwater management plan in place at the time of the application through the permitting process.

Regional growth and land use changes associated with the proposed plan would not substantially degrade water quality in violation of water quality standards. The impact would be less than significant (LTS) because future projects associated with the land use growth footprint would adhere to existing regulations and would operate under the oversight of applicable regulatory agencies. Through these actions, it is anticipated that growth would occur without resulting in a violation of water quality standards.

Sea Level Rise Adaptation Impacts

Construction

The proposed plan includes sea level rise adaptation projects to protect communities in shoreline areas that are currently or may be vulnerable to future inundation from sea level rise. The implementation of these adaptation projects would result in construction of a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Similar to the construction effects described above for the land use impacts, these adaptation projects could result in temporary construction that could result in release of sediment and other pollutants that can degrade water quality.

These potential impacts would be addressed through compliance with NPDES Construction General Permits and implementation of a SWPPP that identifies BMPs to reduce potential construction impacts, as described above. In addition to the standard erosion control measures listed above, in-water work could include excavation during low tide and use of floating containment berms to limit the potential for

sediment entrainment and transport. Because the NPDES permitting process requires compliance with TMDLs for 303(d)-listed waters, construction of adaptation projects in accordance with these permits would not be expected to contribute to violations of water quality standards. Further, individual projects would be required to demonstrate compliance with the applicable water quality or groundwater management plan in place at the time of the application through the permitting process. Therefore, although these types of projects are more frequently in proximity of, or in direct contact with, surface water than other projects included in the plan, potential effects on water quality would be addressed through compliance with applicable regulations described above.

In addition, Section 404 of the CWA establishes a permit program, administered by USACE, to regulate discharge of dredged or fill materials into waters of the United States. Levees, road modifications, and other sea level rise adaptation projects would be subject to this permit. Projects within the San Francisco Bay would be completed under the oversight of BCDC and the requirement of Section 66605 of the McAteer-Petris Act that Bay fill for a project be the minimum necessary to achieve the purpose of the fill. These regulations, which are related to dredge and fill of waterways, provide additional regulatory framework to address the potential for construction to disturb the sediments in a manner that substantially degrades water quality. Therefore, construction of sea level rise adaptation projects associated with the proposed plan would be less than significant (LTS).

Operation

Once constructed, the adaptation projects would not substantially degrade water quality, such as by violating water quality standards or waste discharge requirements. Levees, sea walls, and wetland restoration projects would not be expected to release pollutants or cause erosion that would contribute to degradation of surface water or groundwater quality. Further, levees with native plants and wetland restoration projects could increase filtration of polluted or contaminated waters. Elevation of roadways and bridges to adapt to sea level rise also would not be expected to adversely alter the quality of runoff and its potential for effects on surface water or groundwater quality. Sea level rise adaptation projects would have potential to change drainage patterns or increase impervious surfaces. However, as discussed above, these projects would be required to implement stormwater management requirements in compliance with existing regulations, particularly the San Francisco Bay RWQCB MS4 NPDES permit, to prevent the degradation of water quality. The impact would be less than significant (LTS) because the sea level rise adaptation projects would adhere to existing regulations.

Transportation System Impacts

Construction and Operation

Transportation projects would include a variety of improvements, such as new express lanes, auxiliary lanes, roadway widening, increased transit service, and other maintenance and rehabilitation projects, as well as new rail projects that would increase the amount of impervious surface in the region. Transportation projects would require drainage control measures similar to those described above for land use projects. New impervious surfaces required for roadways or rail infrastructure could have minor effects on the receiving waters, water that filters into the ground, and groundwater basins, all of which could be affected by pollutants in the runoff from proposed future projects.

As discussed above for land use and growth under the plan, specific regulations, such as the statewide Construction General Permit, are in place to substantially reduce the effects of construction activities on receiving waters. Transportation projects that fall under Caltrans jurisdiction would be covered by the Caltrans NPDES Stormwater Program. As described in Section 3.10.2, “Regulatory Setting,” above, this NPDES permit regulates all stormwater discharges from Caltrans-owned conveyances, maintenance facilities, and construction activities. Caltrans also has a Statewide SWMP (Caltrans 2016) that describes the procedures and practices used to reduce or eliminate the discharge of pollutants to storm drainage

systems and receiving waters. Guidance documents have also been developed by Caltrans to implement stormwater BMPs in the design, construction, and maintenance of highway facilities. The need for, and design of, BMPs would be dictated by the project-level SWPPP and the presence of surrounding sensitive resources. During the SWPPP development process, BMPs intended to reduce erosion and subsequent sediment transport, such as silt fencing, fiber rolls, sandbag barriers, and slope stabilization, would be identified to substantially reduce or eliminate the discharge of pollutants into receiving waters, including 303(d)-listed water bodies. During operations and maintenance of planned transportation projects, operational BMPs would prevent substantial water quality degradation in compliance with applicable stormwater runoff discharge permits. Operation-phase BMPs would be evaluated during the development of drainage designs and would consider factors such as permanent stabilization of disturbed soil and natural stormwater quality treatment. Planned transportation projects where local agencies are the lead agency would be subject to local and State regulations for runoff prevention.

Additionally, Attachment G of the Phase II MS4 permit requires all permittees in the jurisdiction of the San Francisco Bay RWQCB to develop and implement integrated pest management (IPM) policies to prevent the impairment of streams by pesticide-related toxicity from vegetation management conducted in or near aquatic resources. The IPM policies would regulate the use of the following pesticides of concern: organophosphorus pesticides (chlorpyrifos, diazinon, and malathion), pyrethroid pesticides (bifenthrin, cyfluthrin, betacyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda cyhalothrin, permethrin, and tralomethrin), carbamates (e.g., carbaryl), and fipronil. The IPM policies would require all employees and landscape contractors involved in the application or use of pesticides to be trained in IPM practices. The implementing agencies would be required to track the use of pesticides of concern by employees and contractors and report use information to the San Francisco Bay RWQCB when requested.

The regulatory requirements outlined above would require treatment of runoff to substantially reduce or eliminate the discharge of pollutants to storm drain systems and receiving waters. For projects that discharge to 303(d)-listed impaired water bodies, compliance with established TMDLs that target the removal of the pollutants causing the impairment would be required. Impacts would be less than significant (LTS) because construction and operation of transportation projects would require adherence to existing regulations and would be operated under the oversight of applicable regulatory agencies. Implementation of transportation network improvements and programs associated with the proposed plan would not substantially degrade water quality in violation of applicable water quality standards.

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would have a **less-than-significant (LTS)** impact because existing federal, State, and local regulations and oversight are in place to specify mandatory actions that must occur during project development, which would adequately address potential for construction or operation of projects to result in violation of water quality standards or waste or stormwater discharge requirements. No mitigation is required.

Mitigation Measures

None required.

Impact HYDRO-2: Substantially decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin (LTS)

Land Use Impacts

Construction and Operation

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050 the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. The forecasted growth pattern is a result of existing zoning and other land use policies, the regional growth forecast, and the proposed plan's Growth Geographies and land use strategies. As summarized in **Table 2-4**, urbanization—growth on land not designated as urban built-up land as defined by the California Department of Conservation through the Farmland Mapping and Monitoring Program (FMMP)—is forecasted to occur on approximately 8,093 acres, or 23% of the land use growth footprint. The remaining 77% of the land use growth footprint would be within land designated as urban built-up—which the FMMP defines as "land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel"—reflective of the proposed plan's core growth approach to leverage existing infrastructure through growth in established areas.

The following analysis addresses the potential for the proposed plan to draw groundwater at a rate that outpaces recharge or results in development that would inhibit recharge such that the project would be in conflict with plans to manage groundwater in a sustainable fashion. The capacity for water purveyors to provide adequate water supply to meet water demand associated with anticipated development is analyzed in Section 3.14, "Public Utilities and Facilities."

Urbanized portions of the plan area depend upon a combination of surface water, groundwater, recycled water, and water conservation to provide water supplies for existing and planned residents and businesses. Groundwater pumping typically increases during dry years and is less in wet years, when surface water supplies are more available. Groundwater supplies are decreased when use outpaces recharge. SGMA provides a regulatory framework for the management and use of groundwater in a manner that can be maintained without causing undesirable results. Under this act, undesirable results are defined as the chronic lowering of the groundwater table, reduction of storage capacity, intrusion of seawater, degradation of groundwater quality, subsidence of land, and depletions of interconnected surface water; these conditions must be both significant and unreasonable to be considered an undesirable result.

As discussed above, SGMA requires the formation of GSAs to manage local groundwater basins; this includes the development of GSPs or alternatives to GSPs by 2022. Groundwater basins throughout much of the plan area have been classified as high- or medium-priority basins under SGMA (see **Figure 3.10-4**). Under SGMA, agencies in high- and medium-priority basins are required to be managed to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. As noted above, GSPs have not been submitted to DWR for most of these basins (see **Table 3.10-4**).

Urban development could interfere with groundwater recharge by creating additional impervious surfaces that interfere with infiltration of precipitation, which can result in decreased groundwater supplies. Most (77%) of the forecast growth would occur in areas that are already developed. Concentrating development within urban cores, as proposed by the plan, could reduce the groundwater recharge effects.

Infiltration rates can vary and largely depend on the characteristics of the exposed overlying soils and vegetation. In general, sandy soils have higher infiltration rates and can contribute to groundwater recharge;

clay soils tend to have lower percolation potentials; and impervious surfaces, such as pavement, substantially reduce infiltration capacity. Regional development associated with implementation of the proposed plan may result in the addition of new impervious surface areas, which may interfere with infiltration of precipitation. This can result in localized lowering of the groundwater table.

Table 3.10-5 summarizes the acreage of the land use growth footprint within groundwater basins, by county. The proposed plan would guide the forecasted land use growth footprint away from undeveloped locations that may be well suited to facilitating groundwater recharge, and this total acreage of potential development is largely within developed areas that may currently include impervious surfaces. In addition, extensive storm drainage systems present in these areas currently intercept rainfall and runoff waters, thus limiting the amount of groundwater recharge that occurs. These basins are generally large (see **Table 3.10-2**), and the land use growth footprint where development is expected to increase the extent of impervious surfaces is generally a small portion of the basin.

Table 3.10-5: Acreage of Land Use Growth Footprint within Groundwater Basins

County	Total (acres)
Alameda	7,600
Contra Costa	5,300
Marin	310
Napa	800
San Francisco	2,700
San Mateo	2,200
Santa Clara	7,100
Solano	2,400
Sonoma	1,400
Regional Total	29,700

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: DWR 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

As new development and redevelopment occurs, on-site drainage plans would be designed to retain, capture, and convey increased runoff in accordance with the city or county design standards (e.g., Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, Santa Clara Clean Water Program) and State requirements, such as Provision C.3 site control features. These standards and regulations generally require or encourage the use of LID features, such as vegetated swales, permeable paving, landscaping used for infiltration, and other measures that would retain runoff as much as possible and allow for on-site infiltration.

Land development projects could increase the total amount of impervious surfaces in the region and, as a result, redirect precipitation that might otherwise recharge groundwater. However, existing regulatory requirements at the local, State, and federal level include measures to minimize any increases in off-site stormwater runoff by encouraging on-site infiltration, which should effectively minimize the potential reduction in groundwater recharge to an acceptable level. Activities would be implemented under California regulations governing use of groundwater, including the SGMA, as well as groundwater provisions of applicable local general plans. Taken as a whole, these regulations are intended to reduce groundwater use and subsequent overdraft of groundwater basins. Further, as discussed above under Impact HYDRO-1, Provision C.3 of the NPDES program and CALGreen require new development to incorporate LID strategies, including on-site infiltration, as initial stormwater management strategies.

The proposed plan would accommodate the regional growth forecast and would not directly increase the potential for growth, associated development, and groundwater demand. Further, by promoting infill development, the proposed plan would minimize the potential for new impervious surfaces that could impede groundwater recharge. The type of development envisioned under this plan would be served by water purveyors that manage water supplies and generally would not use individual groundwater wells. Any "water demand project," as defined by Section 15155 of the State CEQA Guidelines, requires preparation of a water supply assessment that must be prepared by the governing body of a public water system, or the city or county lead agency, pursuant to and in compliance with Sections 10910–10915 of the Water Code. Further, as described above, the medium- and high-priority basins in the plan area are developing GSPs or have submitted alternative plans to comply with SGMA and manage groundwater to conserve supplies. The GSPs are required to provide mechanisms that allow the sustainable use of groundwater, with growth projections considered. Therefore, the regional impacts of implementation of the plan on sustainable groundwater management would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction

The proposed plan includes environmental Strategy EN1, "Adapt to Sea Level Rise," to protect shoreline communities affected by sea level rise. This would be achieved through a series of adaptation archetypes. **Table 3.10-6** summarizes the acreage of the sea level rise adaptation projects footprint within groundwater basins, by county. The largest acreage of sea level rise adaptation projects are planned in Alameda, Marin, and Sonoma Counties. In total, the sea level rise adaptation footprint within groundwater basins is 72,300 acres.

Table 3.10-6: Acreage of Sea Level Rise Adaptation Projects Footprint within Groundwater Basins

County	Total (acres)
Alameda	7,500
Contra Costa	4,400
Marin	12,500
Napa	3,800
San Francisco	1,200
San Mateo	5,400
Santa Clara	6,400
Solano	6,700
Sonoma	24,300
Regional Total	72,300

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Sources: DWR 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The plan would address sea level rise adaptation through elevating roadways and rail infrastructure to maintain connectivity while allowing for ecosystem linkages beneath, constructing levees—both traditional and horizontal—to provide flood protection and support wetland migration, and implementing seawalls in highly developed areas to limit erosion and flooding. Tidal gates would be implemented to regulate tidal flows and storm surges in critical waterways, while marsh restoration efforts would enhance natural flood resilience and restore wetland habitat. Levees and marsh restoration projects would not impair groundwater recharge. Where projects would result in impermeable surfaces, they would be relatively small footprints and may largely replace existing structures (e.g., elevation of existing

roadways). Therefore, these modifications would not substantially decrease groundwater supplies or interfere with groundwater recharge in a manner that may impede sustainable groundwater management. The impact would be less than significant (LTS).

Operation

Implementation of sea level rise adaptation projects are not anticipated to result in new impervious surfaces that impede infiltration and would be unlikely to require groundwater pumping during operation. Installation of sea walls and other barriers can alter the hydrogeology and potential exchange of surface water and groundwater, particularly in areas that are underlain with bay mud, a thick and impermeable clay that underlies the San Francisco Bay. This could restrict intermixing of the bay water and groundwater at the local scale, potentially improving groundwater quality in the vicinity of the barrier but would not be expected to alter groundwater quality of the basin overall. Therefore, these modifications would not substantially decrease groundwater supplies or interfere with groundwater recharge in a manner that may impede sustainable groundwater management. The impact would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

As stated in Impact HYDRO-1, the proposed transportation projects may result in some increases in the extent of impervious surfaces. **Table 3.10-7** provides the total acreage of groundwater basins potentially affected by the proposed transportation footprint, by county. Many of the proposed transportation facilities would be located on or adjacent to existing highways, streets, and roads. Extensive storm drainage systems present in these areas currently intercept rainfall and runoff waters, thus limiting the amount of groundwater recharge that occurs. Local agency standards (e.g., Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, Santa Clara Clean Water Program, as well as any City drainage control requirements) and Caltrans standards, combined with State and federal regulations and BMPs, require drainage studies for transportation projects. These studies address drainage issues, including incorporation of infiltration systems where appropriate to limit off-site runoff volumes. New impervious surfaces required for roadways or rail infrastructure would have limited potential to interfere with groundwater recharge. As discussed above for land use impacts, established regulations encourage the use of design features that manage increased runoff in a manner that does not impair basin recharge. As a result, transportation projects, which are often linear, generally do not result in a substantial effect on any one groundwater basin.

Table 3.10-7: Acreage of Transportation Footprint within Groundwater Basins

County	Total (acres)
Alameda	2,500
Contra Costa	710
Marin	90
Napa	3
San Francisco	130
San Mateo	780
Santa Clara	1,800
Solano	720
Sonoma	690
Regional Total	7,400

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Sources: DWR 2019; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Many of the planned transportation projects, such as the addition of new lanes to a roadway or highway, would result in relatively small increases in the extent of impervious surfaces in areas that already include extensive storm drainage systems that intercept rainfall and runoff waters. On-site drainage plans for new features would be designed to retain, capture, and convey runoff in accordance with the city or county design standards, where applicable, and federal and State requirements. Depending on site features, BMPs that improve stormwater quality and promote groundwater recharge, such as stormwater collection basins and vegetated swales that promote on-site infiltration, may be incorporated into project designs. These projects would also be unlikely to require groundwater pumping during operation. The impacts of the planned transportation projects would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could increase the total amount of impervious surfaces in the region and, as a result, redirect precipitation that might otherwise recharge groundwater. However, existing regulatory requirements at the local, State, and federal level include measures to minimize any increases in off-site stormwater runoff by encouraging on-site infiltration, which would effectively minimize the potential reduction in groundwater recharge to an acceptable level. Therefore, the proposed plan would have a **less–than-significant (LTS)** impact.

Mitigation Measures

None required.

Impact HYDRO-3: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, or additional sources of polluted runoff (LTS)

Land Use Impacts

Construction

Land development that occurs to accommodate forecasted population growth in the plan area would have the potential to alter existing drainage patterns. Existing regulations establish permitting and oversight responsibilities for federal, State, and local agencies that are intended to ensure that such alteration does not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or polluted runoff. State and federal agencies (including EPA, SWRCB, and RWQCBs) have established basin plans, water quality standards, and waste discharge requirements to prevent the degradation of water quality pursuant to the CWA.

Construction and grading activities associated with development of the proposed plan could require temporary disturbance of underlying soils through excavation, soil stockpiling, boring, and grading activities that strip existing vegetation or pavement before commencing construction of proposed improvements. These activities could result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment and contaminants in the runoff. The extent of the impacts is dependent on soil erosion potential, type of construction practice, extent of disturbed area, timing of precipitation events, topography, and proximity to drainage channels. If precautions are not taken to contain sediments, construction activities could produce substantial pollutants in stormwater runoff.

Erosion and sedimentation in the watershed as a result of urban development generally are controlled through compliance with applicable NPDES permits and local drainage and erosion design and standards. All development within the region that would disturb 1 acre or more would be required to prepare and implement a SWPPP, in accordance with the NPDES Construction General Permit. The SWPPP would

include BMP erosion control measures, such as those listed in the discussion of HYDRO-1, above. Projects that would disturb less than 1 acre would be subject to the CALGreen requirements related to stormwater drainage that have been designed to prevent or reduce discharges of sediments through BMPs that include on-site retention and filtration. Generally, earthwork and ground-disturbing activities also require a grading permit, compliance with which minimizes erosion, and local grading ordinances ensure that construction practices include measures to protect exposed soils. Additional reports, such as a soil engineering report, engineering geology report, or plans and specifications for grading, may be required by local building or engineering departments, depending on the proposal. The application, plans, and specifications (if any) would be checked by the appropriate building official or engineer and may be reviewed by other departments of the county or city to ensure compliance with the laws and ordinances under their jurisdiction. Earthwork recommendations for improved erosion controls, based on site conditions, would be incorporated into the project construction documents. For further discussion of the potential for direct impacts related to erosion, refer to Section 3.8, "Geology, Seismicity, and Mineral Resources."

Development near the coast would be subject to the California Coastal Commission's Coastal Development Permit under the California Coastal Act. This permitting process would impose specific management measures and BMPs for protection of coastal watersheds and provides the commission with authority to control development that contributes to erosion. It also gives the commission the ability to limit development activities that are sited in highly erodible areas with steep slopes and unstable soils or that accelerate the volume or rate of runoff from a site in a manner that would affect downstream habitats and structures. Future development would be required to incorporate BMPs and LID stormwater management principles. In accordance with federal, State, and local stormwater management regulations, new construction must maintain pre-project hydrology, incorporate proper pollutant source controls, and treat stormwater runoff through BMPs when source control or exposure protection are insufficient for reducing runoff pollutant loads. Therefore, construction impacts associated with the implementation of the proposed plan's forecasted development pattern that could result in additional runoff would be less than significant (LTS).

Operation

Common urban pollutants (e.g., petroleum hydrocarbons, lubricants, herbicides and pesticides, sediments, and metals [generated by the wear of automobile parts]) could be transported in runoff and washed by rainwater from rooftops and landscaped areas into local drainage networks, potentially adversely affecting the quality of receiving surface waters or groundwater. Managed landscaping areas in the region could provide a source of nutrients, weed abatement herbicides, and irrigation runoff. Contributions of these contaminants and other common urban pollutants to stormwater and nonstormwater runoff could degrade the quality of receiving waters (surface water and groundwater) if they are not properly managed. During the dry season, vehicle use and other urban activities release contaminants on impervious surfaces and in landscaped areas, where they can accumulate until the first storm event. During this initial storm event, or first flush, the concentrated pollutants can be transported via runoff to stormwater drainage systems. Contaminants can also be released during the dry season as a result of overirrigation and other urban water uses (e.g., car washing, hosing down paved surfaces). Runoff during storm events and nonstormwater flows (e.g., overirrigation) can transport contaminants into stormwater drainage systems that discharge into rivers, agricultural ditches, sloughs, and channels and ultimately could degrade the water quality of any of these water bodies. Contaminated runoff can also infiltrate into groundwater basins and negatively affect groundwater quality.

Local and State regulations would require developments to apply BMPs, implement control measures, adhere to NPDES permit requirements, and comply with local drainage standards. Drainage plans would be consistent with the San Francisco Bay RWQCB MS4 NPDES permit or any applicable local drainage control requirements that exceed or reasonably replace any of these measures to protect receiving waters

from pollutants. In addition, NPDES Provision C.3 requirements include postconstruction drainage control requirements that address the volume of off-site flows, which can be effective in reducing sedimentation effects on downstream receiving waters. Project proponents are required to plan, design, and develop sites to (1) protect areas that provide important water quality benefits necessary to maintain riparian and aquatic biota and/or are particularly susceptible to erosion and sediment loss; (2) limit increases in the extent of impervious areas; (3) limit land disturbance activities, such as clearing and grading, and cut-and-fill to reduce erosion and sediment loss; (4) limit disturbance of natural drainage features and vegetation; and (5) reduce erosion and, to the extent practicable, retain sediment on-site during and after construction.

Under Provision C.3, the San Francisco Bay RWQCB requires appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges. In some cases, adherence to NPDES Provision C.3 requirements may result in improved retention of stormwater rates and volumes, compared to existing conditions, through implementation of LID drainage control measures. LID features include creating bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. These features result in a corresponding reduction of the potential for stormwater pollution. The LID approach to stormwater management overlaps with NPDES site control measures that include conserving natural areas, protecting slopes and channels, and minimizing impervious areas. Projects would also generally comply with the design guidelines established in the *Development BMP Handbook* (CASQA 2021) to minimize increases in the amount of pollutants entering the storm drain system.

Implementation of the proposed plan would result in new development and redevelopment that would have the potential to disturb underlying soils and result in changes to existing drainage patterns. Although there is potential for the forecasted development pattern to cause or contribute to a long-term increase in discharges of urban contaminants into the stormwater drainage system compared to existing conditions, subsequent projects would be required to incorporate BMPs and LID stormwater management principles. In accordance with federal, State, and local stormwater management regulations, new development must maintain pre-project hydrology, incorporate proper pollutant source controls, and treat stormwater runoff through BMPs when source control or exposure protection are insufficient for reducing runoff pollutant loads. Therefore, impacts associated with the implementation of the proposed plan's forecasted development pattern that could result in additional runoff would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction

As described above, the sea level rise adaptation projects would protect communities and infrastructure from sea level rise through an approach that employs elevated roadways and rail infrastructure, levees, seawalls, tidal gates, and marsh restoration. Construction of the sea level rise adaptation projects could result in short-term hydromodification and expose soils to erosion. As described above for the land use growth footprint, existing permitting requirements for land disturbance would address the potential for erosion and siltation during construction. As described in Section 3.9, "Hazards and Wildfire," use of hazardous materials during construction of the sea level rise adaptation projects is not expected to require use of potentially hazardous materials that would create a substantial hazard or potential for substantial additional sources of polluted runoff.

Sea level rise adaptation projects within the bay and other waterways would require permits that would impose requirements to study the potential effects of any hydromodification and protect against undesirable impacts, including erosion. The design of in-water structures, such as sea walls and levees, would be subject to permitting from agencies, including the California Coastal Commission, BCDC, USACE, the San Francisco Bay RWQCB, and EPA. Projects that would discharge dredged or fill materials

into waters of the United States would be subject to permitting under Section 404 of the CWA. Construction sites disturbing 1 or more acres would be required to comply with the State's General Stormwater Permit for Construction Activities. These established oversight mechanisms would address construction methods and project design of specific future projects to minimize the potential for hydromodification that could generate substantial erosion, siltation, or pollution. The construction impact associated with sea level rise adaptation projects would be less than significant (LTS).

Operation

Once constructed, projects such as levees, seawalls, marsh restoration, and tidal gates would not be expected to cause or contribute to erosion or pollution runoff. Elevated roadway adaptation projects would improve the transportation system's resilience to sea level rise and would be subject to the regulations described below for other transportation projects that reduce the potential for release of pollutants. Therefore, because of the nature of the sea level rise adaptation projects and through compliance with established regulations that would address the potential for hydromodification that could provide substantial additional sources of polluted runoff, the operational impacts associated with sea level rise adaptation projects would be less than significant (LTS).

Transportation System Impacts

Construction

Construction and earth-moving activities associated with transportation projects could increase erosion, which could result in sediment loading in local waterways and subsequent effects on water quality. The extent of the impacts would be dependent on soil erosion potential, type of construction practice, extent of disturbed area, timing of precipitation events, topography, and proximity to drainage channels. Transportation projects that would disturb more than 1 acre would be required to adhere to the same NPDES Construction General Permit requirements discussed above . The permit requirements include preparation and implementation of a SWPPP detailing BMPs that would be employed to control on-site stormwater drainage during construction. Projects that fall under Caltrans's jurisdiction also would be required to adhere to the Caltrans NPDES permit. Projects that would disturb less than 1 acre would be subject to the CALGreen requirements related to stormwater drainage for nonresidential projects, including BMPs designed to prevent soil loss and release of contaminants.

The design of transportation projects that would have the potential to alter drainage patterns, such as road widening or construction of other additional impervious surfaces, would conform to local stormwater drainage master plans, regional MS4 permit requirements, and any applicable Caltrans drainage requirements. Caltrans has a Storm Water Management Plan that describes the procedures and practices it implements to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. The Caltrans Project Planning and Design Guide (Caltrans 2023) was developed with the intention to reduce, to the maximum extent practicable, pollutant loadings from a project site after construction, and comply with the Caltrans NPDES permit and Construction General Permit. Permanent stormwater BMPs reduce suspended particulate loads in runoff and, thus, pollutants associated with sediment particles (e.g., certain metals, such as lead and mercury, PCBs, and polycyclic aromatic hydrocarbons). The Caltrans Project Planning and Design Guide contains guidance on the selection and implementation of many of the Phase II MS4 permit requirements, such as site design measures, stormwater treatment, and hydromodification management BMPs. The Caltrans Storm Water Management Plan sets the maintenance practices for controlling erosion and siltation. Therefore, the potential impacts associated with the implementation of proposed plan's transportation projects would be less than significant (LTS).

Operation

Operation of the proposed plan's transportation projects and programs could also increase nonpoint pollution of stormwater runoff because of litter, fallout from airborne particulate emissions, or discharges

of vehicle residues, including petroleum hydrocarbons and metals, that could affect the quality of receiving waters. During the dry season, vehicles and other urban activities release contaminants onto the impervious surfaces, where they can accumulate until the first storm event. During a storm event, the concentrated pollutants can be transported via runoff to stormwater drainage systems that discharge into rivers, agricultural ditches, sloughs, and channels and ultimately could degrade the water quality of any of these water bodies. As new roads, lanes, or other new impervious surfaces are added to accommodate projected vehicular traffic, the potential also increases for associated stormwater pollutants to enter receiving waters because of the increase in the extent of impervious surfaces and the anticipated increase in vehicle travel. For further discussion of pollutants commonly associated with transportation corridors, refer to Section 3.9, "Hazards and Wildfire."

Any enhancements or modifications to California State highways would be required to follow Caltrans guidelines, which include the preparation of a hydraulic study and submittal of a hydraulics study report for any project intercepting a waterway or encroaching upon a floodplain, to assess the potential impacts on natural processes and beneficial uses as part of the environmental review (Caltrans 2015). Transportation projects for which local agencies are the lead agency are subject to local and State regulations for construction and nonconstruction runoff prevention. In accordance with federal, State, and local stormwater management regulations, new construction must incorporate proper pollutant source controls and treat stormwater runoff through BMPs when source control or exposure protection is insufficient for reducing runoff pollutant loads. Because transportation projects would comply with these requirements, implementation of the proposed plan would not be expected to alter existing drainage patterns in a manner that would result in substantial erosion, siltation, or additional sources of polluted runoff. Therefore, the potential impacts associated with the implementation of proposed plan's transportation projects would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in new development and redevelopment that would have the potential to result in project-specific changes to existing drainage patterns. In compliance with adopted regulations, individual projects are expected to adopt BMPs appropriate to local conditions. This impact would be **less than significant (LTS)** because there are existing federal, State, and local regulations and oversight in place that would effectively reduce the potential for erosion and siltation or release of pollutants due to drainage pattern changes to an acceptable level.

Mitigation Measures

None required.

Impact HYDRO-4: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site (LTS)

Land Use Impacts

Construction and Operation

Implementation of the proposed plan's forecasted development pattern would increase the amount of impervious surface in the region, such as new paved areas, building rooftops, and parking lots. This increase in the amount of impervious surface has the potential to generate additional stormwater runoff. In addition, runoff could discharge at a greater rate, leading to higher peak flows during storm events that

could increase the potential for stormwater to cause flood conditions. Urban areas can flood when storm drains and small channels become blocked or surcharged during intense short-duration storms.

Drainage plans would be consistent with the San Francisco Bay RWQCB MS4 NPDES permit or any applicable local drainage control requirements that exceed or reasonably replace any of these measures to control the rate of stormwater runoff. NPDES Provision C.3 includes postconstruction drainage control requirements that address the volume of off-site flows. As described above, project proponents would be required to plan, design, and develop sites to limit both increases in the extent of impervious areas and disturbance of natural drainage features. Under Provision C.3, the San Francisco Bay RWQCB requires designs that prevent increases in runoff flows from new development and redevelopment projects. In some cases, adherence to NPDES Provision C.3 requirements may result in improved retention of stormwater rates and volumes, compared to existing conditions, through implementation of LID drainage control measures. LID features include creating bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. Projects that would disturb less than 1 acre would be subject to the CALGreen requirements related to stormwater drainage. Projects would also generally comply with the design guidelines established in the *Development BMP Handbook* (CASQA 2021) to minimize increases in both the volume and rate of stormwater runoff. In addition, development near the coast would be subject to the California Coastal Commission's Coastal Development Permit under the California Coastal Act, which would impose specific management measures and BMPs for protection of coastal watersheds. The California Coastal Act also provides the commission with authority to control development that contributes to flooding and surface alterations in and around the development site.

As described in Section 3.14, "Public Utilities and Facilities," development could require the expansion or construction of new stormwater drainage facilities consistent with State water quality standards, applicable local ordinance, and any design standards adopted by the local utility. These may include on-site retention or detention ponds and upgrades to off-site stormwater transmission (e.g., pipeline improvements, culvert upgrades, or enhanced flood protection along natural drainageways used for stormwater conveyance) that attenuate flow from the site and facilitate conveyance. Local plan review would generally require preparation of hydrologic engineering reports that demonstrate the project would not substantially increase the rate or amount of off-site flow, as well as analysis of the capacity of off-site infrastructure to accommodate flows. Based on local conditions and applicable local ordinances, on-site LID measures to reduce flow would be incorporated into the project. The application, plans, and specifications (if any) would be checked by the appropriate building official or engineer and may be reviewed by other departments of the county or city to ensure compliance with the laws and ordinances under their jurisdiction.

Land development that occurs to accommodate forecast population in the plan area would have the potential to alter existing drainage patterns. In accordance with federal, State, and local stormwater management regulations, new construction must maintain pre-project hydrology. Local ordinances generally provide prescriptive requirements related to infrastructure capacity and design and limit the potential for development to increase off-site flows. All projects that would disturb 1 acre or more would be subject to San Francisco Bay RWQCB requirements that prevent increases in runoff flows from new development and redevelopment projects. The required LID drainage control measures may, in some cases, result in improved retention of stormwater rates and volumes compared to existing conditions. Development near the coast would be subject to the California Coastal Commission's Coastal Development Permit and oversight. Therefore, impacts associated with the implementation of the proposed plan's forecasted development pattern would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction and Operation

As described above, the sea level rise adaptation projects would protect communities and infrastructure from sea level rise through an approach that employs a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Marsh restoration and horizontal levees can intentionally open an area to flooding and attenuate rising tides. Both BCDC and the proposed plan support use of wetlands to buffer tides and streamflows to reduce the potential for flooding.

Many of these projects (e.g., levees and sea walls) would be located in proximity to the San Francisco Bay and would not contribute additional runoff to a storm drain system, because they would drain directly to the surface water bodies (see Impact HYDRO-1 for further discussion). Elevated roadway and rail infrastructure would improve the transportation system's resilience to sea level rise and would not result in a substantial increase in runoff volumes. Additionally, as discussed above for the land use impacts, compliance with existing regulations, particularly the San Francisco Bay RWQCB MS4 NPDES permit, would address the potential for construction or operation of the sea level rise adaptation projects to result in an increase in runoff. However, because they provide a physical barrier to potential floodwater, sea walls and traditional levees could affect shore hydrology and the potential for off-site flooding if not designed appropriately. These projects would be subject to oversight and permitting from a variety of agencies, potentially including the California Coastal Commission, BCDC, USACE, the San Francisco Bay RWQCB, and EPA. Implementing agencies would conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains to demonstrate compliance with Executive Order 11988 (for federally funded projects) and the Cobey-Alquist Floodplain Management Act, which prohibits construction of structures in the designated floodway that would restrict carrying capacity. Engineering designs would evaluate the anticipated project-level effects to area hydrology, and permitting agencies would limit fill or other shoreline modifications.

As described above, sea level rise adaptation projects within the bay and other waterways would require permits from the State that would impose requirements to study the potential effects of any hydromodification. The design of in-water structures, such as sea walls and levees, would be subject to permitting from agencies, including the California Coastal Commission and the San Francisco Bay RWQCB, that require projects to demonstrate that there would not be a substantial increase in off-site runoff and that off-site flooding would not occur. Therefore, impacts associated with the implementation of the proposed plan's sea level rise adaptation projects would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

Many of the transportation projects would involve alteration or expansion of existing facilities. Improvements to existing facilities, such as the conversion of paved shoulders to lanes, would not likely alter drainage patterns because the facilities are already served by drainage systems and there would not be a substantial increase in the extent of impervious surfaces. However, those improvements that involve grading, recontouring, bridge pilings, and new impervious surfaces may alter existing drainage patterns, including the course of streams and rivers, which may result in increased stormwater flow volumes and velocity, resulting in the potential for erosion, additional sources of polluted runoff, and on- and off-site flooding.

The design of transportation projects that would have the potential to alter drainage patterns would conform to local stormwater drainage master plans and regional MS4 permit requirements, as described above for the land use growth footprint. Transportation projects for which local agencies are the lead agency are subject to local and State regulations for construction and nonconstruction runoff prevention.

Transportation projects would also be required to incorporate BMPs and LID stormwater management principles.

In addition, any enhancements or modifications to California State highways would be required to follow Caltrans guidelines, which include the preparation of a hydraulic study and submittal of a hydraulics study report for any project intercepting a waterway or encroaching upon a floodplain, to assess the potential impacts on natural processes and beneficial uses as part of the environmental review (Caltrans 2020). The Caltrans Highway Design Manual (Caltrans 2020) requires that road storm drain systems be designed to safely drain the 25-year return interval storm, cross-culverts be designed to safely drain the 10-year interval storm, and the headwater depth for the 100-year interval storm not overtop freeways. These existing regulatory requirements substantially address the potential for impacts on drainage patterns and rates.

In accordance with federal, State, and local stormwater management regulations, new construction must maintain pre-project hydrology. Because transportation projects would comply with these requirements, implementation of the proposed plan would not be expected to alter existing drainage patterns in a manner that would result in runoff that exceeds the capacity of existing or planned stormwater drainage systems or results in flooding. Therefore, impacts associated with the implementation of the proposed plan's transportation infrastructure would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could result in new development and redevelopment that would have the potential to result in project-specific changes to existing drainage patterns. In compliance with adopted regulations, individual projects are expected to adopt BMPs appropriate to local conditions. This impact would be **less than significant (LTS)** because there are existing State and local regulations and oversight in place that would effectively reduce the potential for erosion and siltation, release of pollutants, or flooding related to drainage pattern changes to an acceptable level.

Mitigation Measures

None required.

Impact HYDRO-5: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows (LTS)

Land Use Impacts

Construction and Operation

In addition to hydromodifications that could cause localized flooding discussed in Impact HYDRO-4, development of areas that are currently prone to flooding could impede or redirect flood flows. As described above and depicted in **Figure 3.10-2**, FEMA has designated 100-year and 500-year storm event flood hazard zones in the Bay Area. While the majority of proposed plan's land use growth footprint is outside these hazard areas, implementation of the plan's forecasted development pattern could result in approximately 4,400 acres of development in the 100-year floodplain and an additional 4,600 acres of development in the 500-year floodplain (**Table 3.10-8**).

Table 3.10-8: Acreage of Land Use Growth Footprint within Flood Zones

County	100-Year (acres)	500-Year (acres)
Alameda	1,400	900
Contra Costa	800	350
Marin	210	140
Napa	40	20
San Francisco	150	230
San Mateo	250	310
Santa Clara	1,000	2,400
Solano	280	150
Sonoma	150	20
Regional Total	4,400	4,600

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: FEMA 2024; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

FEMA delineates the regulatory floodplain to assist local governments with land use and floodplain management decisions to avoid flood-related hazards. Structures that impede flood flows can cause a backwater effect by potentially raising flood levels, causing more severe flooding impacts on existing vulnerable areas, or exposing new areas that would not have previously flooded to flooding impacts. To avoid flooding, FEMA and the local agencies require that an encroachment into a floodplain not increase the water surface elevation of the 100-year flood by more than 1 foot in floodplains and 0.1 foot in floodways. In addition, any projects constructed within areas subject to flooding because of levee failure, as mapped by FEMA, must be built in compliance with standard building codes and federal, State, and local regulations.

Development (including construction, reconstruction, renovation, repair, expansion, or alteration of buildings, bridges, streets, and other paving and installation of utilities) within a floodplain requires a local floodplain development permit. The specific requirements for a project depend on the flood zone and the type of development. The basic standards that must be met by any floodplain development are that the proposed development must be reasonably safe from flood damage (which for most buildings means elevated above the height of floodwaters) and must not result in physical damage to any other property. Additional requirements for development in flood hazard zones contained in local ordinances and standards may also apply. Technical analysis may be required if there is potential for increased flood heights or diversion of flow.

Any developments proposed within the 100-year flood zone would be required to meet local, State, and federal flood control design requirements. Implementing agencies would conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains to demonstrate compliance with Executive Order 11988 (for federally funded projects), the NFIP, the National Flood Insurance Act, and the Cobey-Alquist Floodplain Management Act, as well as any further FEMA or State requirements that are adopted at the local level. These studies would identify project design features that reduce impacts on either floodplains or flood flows that would be required through the permitting process. With these floodplain development requirements, continuing flood protection programs, and the drainage requirements described above, impacts related to flood flows would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Sea level rise adaptation projects would protect existing businesses, residences, and infrastructure from rising seas. **Table 3.10-9** provides the acreage of the sea level rise adaptation projects footprint within the 100-year and 500-year flood zones established by FEMA. The sea level rise adaptation projects could affect flooding and surface waters in the region. Although intended to protect the parts of the plan area most vulnerable to flooding caused by sea level rise, there is a potential that the adaptation projects could redirect flows. For example, sea walls and traditional levees could affect shore hydrology and the potential for off-site flooding if not designed appropriately because they provide a physical barrier to potential floodwater. In addition, tidal gates can intentionally open an area to flooding to attenuate rising tides and reduce the potential for flooding of upland areas. Marsh restoration and horizontal levees require careful engineering that evaluates the potential to redirect floodwaters. Elevated roadway adaptation infrastructure would improve the transportation system's resilience to sea level rise but may require structures, such as bridge abutments, within the floodplain.

Table 3.10-9: Acreage of Sea Level Rise Adaptation Projects Footprint within Flood Zones

County	100-Year (acres)	500-Year (acres)
Alameda	6,300	520
Contra Costa	4,000	360
Marin	12,500	410
Napa	3,400	80
San Francisco	820	220
San Mateo	5,000	340
Santa Clara	6,000	190
Solano	7,200	40
Sonoma	24,100	90
Regional Total	69,400	2,300

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: FEMA 2024; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In addition to the oversight for development of floodplains through the NFIP and related local regulations, sea level rise adaptation projects would be subject to oversight and permitting from a variety of agencies, potentially including the California Coastal Commission, BCDC, USACE, the San Francisco Bay RWQCB, and EPA. Potential for such projects to alter existing drainage patterns in a manner that would adversely affect conditions outside of the area they are designed to protect would be evaluated and mitigated, as appropriate, through the permitting process. As discussed above, implementing agencies would conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains. These studies would identify project design features that reduce impacts on either floodplains or flood flows, which would inform the project's permit requirements. As described above, FEMA and the local agencies require that an encroachment into a floodplain (i.e., activities or construction within the floodway, including fill, new construction, substantial improvements, and other development) not increase the water surface elevation of the 100-year flood by more than 1 foot in floodplains and 0.1 foot in floodways. With these floodplain development requirements, continuing flood protection programs, and the drainage requirements described above, impacts related to flood flows would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

Some of the transportation projects included in the proposed plan intersect areas mapped within the flood hazard areas. In total, approximately 1,200 acres of potential construction are anticipated in 100-year flood zones for the entire region and an additional 890 acres of development in the 500-year floodplain (see **Table 3.10-10**). Projects in identified flood hazard areas could involve support structures or other aboveground improvements in the floodway that could potentially obstruct floodwaters in some locations. Placement of structures within a floodplain can displace floodwaters and alter the base flood elevations in the surrounding areas. As described above, structures can create a backwater effect, resulting in an increase in the flood elevation level upstream and in neighboring areas. Drainage areas could also be altered by highway corridors, in which floodwaters could be detained by medians and along the roadside. Proposed bridge supports could block debris in waterways, creating obstructions and further elevating upstream flood levels.

Table 3.10-10: Acreage of Transportation Projects Footprint within Flood Zones

County	100-Year (acres)	500-Year (acres)
Alameda	300	190
Contra Costa	50	40
Marin	10	6
Napa	3	0
San Francisco	9	5
San Mateo	60	140
Santa Clara	350	430
Solano	180	40
Sonoma	260	30
Regional Total	1,200	890

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: FEMA 2024; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The regulatory requirements listed in the discussion of land use impacts also apply to transportation projects. Projects and programs in the proposed plan also would be required to comply with FEMA regulations, which mandate no development within the 100-year regulatory floodplain if it could increase the flood elevation by 1 foot or more in floodplains and 0.1 foot in floodways. Any enhancements or modifications to California State highways would be required to follow Caltrans guidelines, which include the preparation of a hydraulic study and submittal of a hydraulics study report for any project intercepting a waterway or encroaching upon a floodplain, to assess the potential impacts on natural processes and beneficial uses as part of the environmental review (Caltrans 2024). Federally funded projects must also comply with the federal Executive Order 11988, which requires that floodplain encroachment occur only if there is no alternative to avoid the floodplain and that all feasible mitigation for floodplain impacts be included in the project. With these floodplain development requirements, continuing flood protection programs, and the drainage requirements described above, impacts related flood flows would be less than significant (LTS).

Conclusion

Because implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would be required to adhere to appropriate federal, State, and local requirements designed to ensure that flooding conditions are not exacerbated, this

impact would be **less than significant (LTS)** because there are existing federal, State, and local regulations and oversight in place that would effectively manage surface runoff.

Mitigation Measures

None required.

Impact HYDRO-6: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation (LTS)

Land Use Impacts

Construction and Operation

As described above, flooding occurs regularly in the plan area, and local structural flood damage reduction measures, such as reservoirs, levees, and channel improvements, have been implemented. Impact HYDRO-5 discusses the potential for the plan to result in development in flood hazard zones. Because the plan is intended to reduce risks from hazards, including planning to protect homes, businesses, and transportation infrastructure from flooding, it is expected to minimize the risk of release of pollutants attributable to flooding in established hazard zones. Further, although tsunami and seiche zones are mapped in the plan area, the risk of release of pollutants attributable to inundation is considered low based on the limited documented history of tsunami- and seiche-induced flooding of the plan area. No substantial damage is expected from either tsunamis or seiches in the plan area, and implementation of the plan would not increase the inherent risk of these natural forces on the plan area.

Numerous existing federal, State, and local laws and regulations are in place to address the management and control of pollutants, including regulations addressing the proper disposal, transportation, storage, and handling of potentially hazardous materials (refer to Section 3.9, “Hazards and Wildfire”). The proposed plan’s forecasted land use growth footprint would be subject to these regulations for the management of pollutants, which would limit the release of pollutants in the event of inundation attributable to flood, levee or dam failure, or seiche. Moreover, subsequent development would be subject to existing regulations intended to limit the potential for flooding to affect development. These include FEMA flood insurance and State flood protection regulations intended to limit flood risk, as well as local flood management programs, zone districts, and regulations; and California Building Code requirements. These regulations would guide growth away from hazardous areas. Therefore, considering the existing regulatory framework, physical context of the plan area and proposed areas of improvements, the forecasted development pattern under the plan would not result in risk related to the release of pollutants attributable to flooding, seiche, or tsunami. Impacts associated with construction and implementation of the proposed plan would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

Construction and Operation

The sea level rise adaptation projects would be located in flood hazard, tsunami, and seiche zones. Construction of the sea level rise adaptation projects would use potentially hazardous materials in limited quantities for maintaining and operating construction equipment. As described in Section 3.9, “Hazards and Wildfire,” these activities are regulated, and the routine use of hazardous materials is unlikely to result in a substantial risk release of pollutants related to project inundation. Once constructed, the sea level rise adaptation projects would not include uses that would result in the release of pollutants if inundated.

Therefore, although sea level rise adaptation projects are likely to be located in flood hazard, tsunami, and seiche zones, it is intended to reduce the risk of secondary flooding hazards, including release of pollutants. The impact of construction and operation of these adaptation projects would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

Some of the transportation projects included in the proposed plan would be placed within the 100-year flood hazard area and potential dam inundation areas. In addition, projects located in the immediate vicinity of shoreline areas may be exposed to inundation from tsunami or seiche waves. As noted above, new transportation structures proposed within a floodplain or inundation areas would be required to adhere to State and federal regulations. The Caltrans Highway Design Manual also requires that the headwater depth for the 100-year interval storm not overtop freeways.

Similar to the sea level rise adaptation projects, limited hazardous materials use would be associated with construction of the transportation projects. As described in Section 3.9, "Hazards and Wildfire," these activities are regulated, and the routine use of hazardous materials is unlikely to result in a substantial risk release of pollutants related to project inundation. Once constructed, the facilities could be used to transport hazardous materials, but storage of materials that could be released if inundated would be unlikely. As discussed in Section 3.9, "Hazards and Wildfire," the routine transport of hazardous materials on transportation infrastructure in the plan area would not present a substantial hazard to the public or the environment. The transportation system would not substantially increase the risk of release of pollutants related to project inundation in flood hazard, tsunami, or seiche zones. This impact would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would be subject to implementation of local, State, and federal floodplain regulations and project-level review. Further, the sea level rise adaptation projects would decrease the potential for inundation in flood hazard, tsunami, and seiche zones, which could reduce the potential for release of pollutants from existing uses. Therefore, considering the existing regulatory framework and physical context of the plan area, potential for release of pollutants attributable to flooding would be reduced to an acceptable level, and this impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

3.11 LAND USE, POPULATION, AND HOUSING

3.11.1 Introduction

This section evaluates the potential effects of the proposed plan on land use and housing in the Bay Area. It describes trends in overall land use and physical development, including job and housing growth. The impact analysis addresses the potential for physical disruption to land uses, displacement of people or housing, and division or separation of communities. In addition, the proposed plan's consistency with adopted land use plans and policies is addressed (see the discussion of Impact 3.11-1, below).

Comments received in response to the Notice of Preparation included concerns regarding potential urban expansion within the Delta and project consistency with Delta policies. Project elements such as land use strategies to address housing affordability and low-income populations and the development of the transportation projects are addressed in Chapter 2, "Project Description." Consistency with natural community conservation plans and habitat conservation plans is addressed in Section 3.5, "Biological Resources." Consistency with airport land use compatibility plans is addressed in Section 3.9, "Hazards and Wildfire."

3.11.2 Environmental Setting

PHYSICAL SETTING

Land Use Patterns

The pattern of land uses in the Bay Area includes a mix of open space, agriculture, developed urban centers, suburban commercial and residential areas, and scattered older towns. This pattern reflects the landforms that physically define the region: the bay, rivers, mountains, hills and valleys. The land uses surrounding the bay margins tend to be more intensely developed, particularly from San Francisco south along the peninsula to Santa Clara County, and from Contra Costa County south through Alameda County to Santa Clara County. These areas also include extensive networks of open space. The counties north of the bay (Marin, Sonoma, and Napa) are more sparsely developed with a combination of suburban development. Smaller cities and towns further to the east, such as the East Bay (away from the bay margins) and Solano County, tend to be more suburban in character, with heavy industry related to oil refineries dotting the landscape and large swaths of agriculture. These general characterizations do not capture all the land use types and patterns associated with the nine counties and 101 cities that make up the plan area.

Extent of Urban Development

As of 2022, approximately 18.3% of the region's approximately 4.5 million acres were considered to be urban built-up land according to the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) (DOC 2022). The FMMP defines urban built-up land as "land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel." The remaining "undeveloped" area includes open space and agricultural lands, as well as water bodies (excluding the San Francisco Bay) and parks (Bay Area Open Space Council 2025). Approximately 30% of the region is identified as protected open space. The amount of urban built-up land according to the FMMP, in each of the nine counties, varies from a low of approximately 5.2% in Napa County to a high of 98.7% in San Francisco (see **Table 2-5** in Chapter 2, "Project Description"). The Bay Area includes 101 cities, with San Jose, San Francisco, and Oakland representing the largest urban centers. Other major

urban centers have formed throughout the region, leading to a pattern of urban land and open space as illustrated in **Figure 3.11-1**. As shown in **Table 3.11-1**, the counties with the highest job totals are Santa Clara, Alameda, and Contra Costa Counties. These counties also have the highest numbers of households.

Table 3.11-1: 2023 Jobs and Households, by County

County	Jobs	Households
Alameda	833,200	608,500
Contra Costa	559,600	416,200
Marin	120,800	101,600
Napa	70,500	51,200
San Francisco	499,500	372,000
San Mateo	409,600	265,100
Santa Clara	985,800	665,500
Solano	204,600	157,800
Sonoma	237,800	192,800
Regional Total	3,921,400	2,830,700

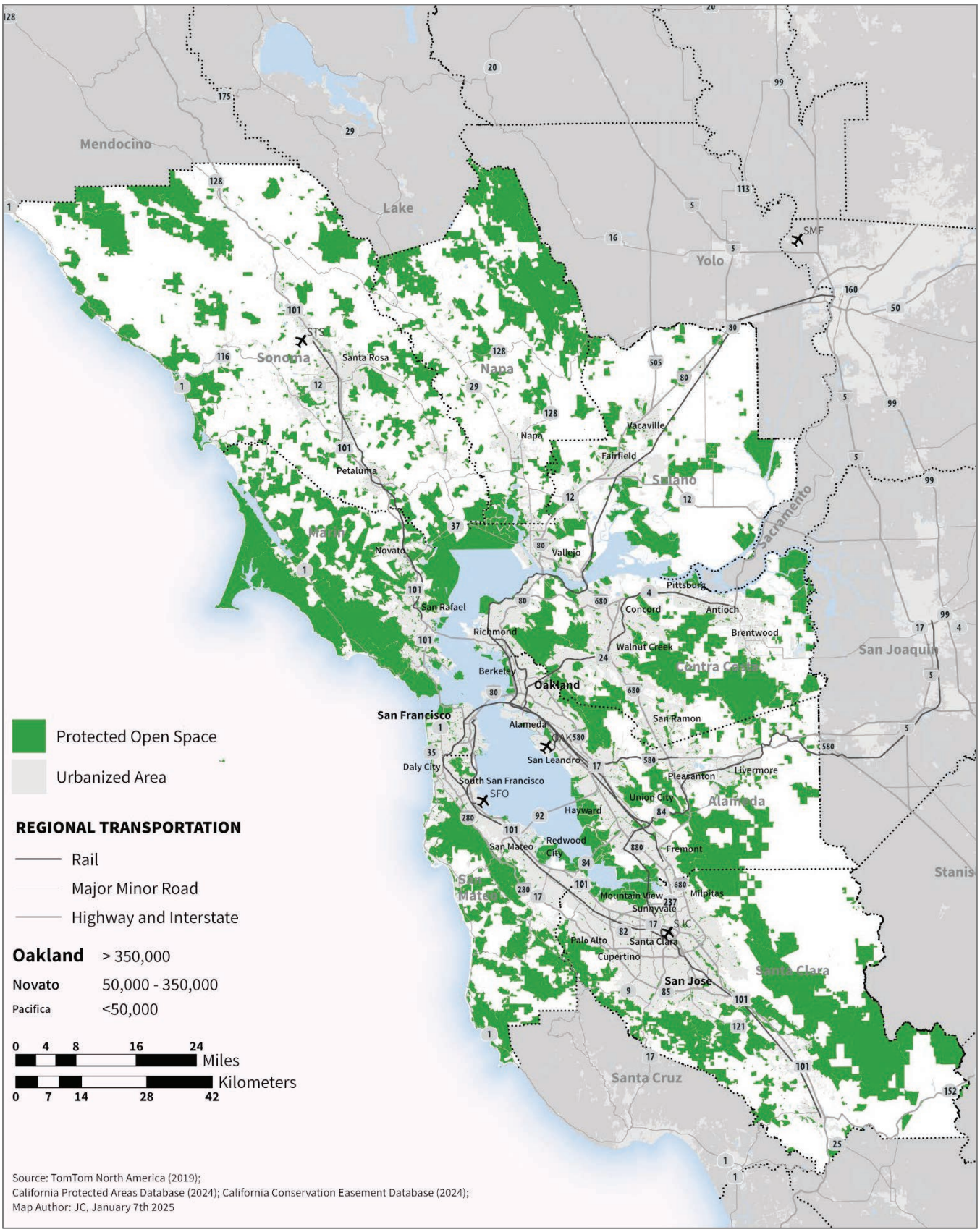
Notes: Whole numbers have been rounded (between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Sources: EDD 2025; UC Census Bureau 2023.

"Focused Growth" Approach

The proposed plan's core approach for leveraging the plan's strategies is "focused growth" in existing communities along the existing transportation network (see Chapter 2, "Project Description"). This approach helps to achieve the proposed plan's vision of ensuring the Bay Area is affordable, connected, diverse, healthy and vibrant for all by 2050. The proposed plan designates specific Growth Geographies as areas prioritized to accommodate the regional growth forecast. Priority Conservation Areas (PCAs) are nominated by local governments. Although PCAs are not part of the Growth Geography framework, they are a set of geographic areas that can be used to target where planning, policy, and implementation activities are needed, and are thus complementary to the growth framework The plan's four Growth Geographies are Priority Development Areas (PDAs), High-Resource Areas (HRAs), Priority Production Areas (PPAs), and Transit-Rich Areas (TRAs). PDAs and PPAs are nominated by local governments; HRAs are places with well-resourced schools and amenities; and TRAs are areas served by rail, ferry, or frequent bus service (see Section 2.3.4, "Proposed Plan Growth Geographies").

The proposed plan includes the designation of Growth Geographies for both housing and jobs. For housing, Growth Geographies include PDAs, HRAs, and TRAs. As noted above, PDAs represent geographic areas identified by MTC and ABAG that can be used to target where planning, policy, and implementation activities are needed. HRAs are identified by the State of California to counterbalance housing policies that have historically led to limited housing development, particularly housing affordable to low-income households. TRAs are included as Growth Geogrphies to support climate emissions goals, with more housing near transit allowing more people to have access to sustainable transportation options (see Section 2.3.4, "Proposed Plan Growth Geographies").

Figure 3.11-1: Urban Land and Open Space



Sources: TomTom North America 2019; California Protected Areas Database 2024; California Conservation Easement Database 2024.

Housing Affordability

The following discussion is summarized from the proposed plan document and Vital Signs, which provides data on housing affordability and population.[1] For more information, please see https://planbayarea.org http://www.mtc.ca.gov/ and https://www.vitalsigns.mtc.ca.gov.

The Bay Area continues to experience one of the most severe housing crises of the nation's large metropolitan areas. Currently, the Bay Area does not contain enough market-rate or affordable housing to accommodate forecasted population and employment growth. This lack of supply contributes to the region's lack of affordable housing, which persists as one of the Bay Area's biggest regional concerns. In 2022, national mortgage and inflation rates increased to multi-decade highs, putting homeownership and market-rate rentals out of reach for many Bay Area residents, especially those with low incomes. San Jose and San Francisco, in particular are routinely ranked among the most expensive cities in the country. To try and address the lack of affordable housing regionwide, MTC and ABAG proposed a historic $20 billion ballot measure intended to generate funding to build and secure more affordable housing throughout the nine-county Bay Area. Additionally, several Bay Area cities and counties have brought their own "self-help" housing funding measures to voters over the years. This includes San Mateo County, which passed a countywide 1/2-cent sales tax to contribute to affordable housing funding in 2016, and Alameda County and San Francisco both of which passed general obligation bonds to address the issue.

There has been a mismatch between growth in job levels and growth in housing supply. The Bay Area has added nearly 1.3 jobs for every housing unit built since 1990. This imbalance in housing production has been most substantial in jobs-rich parts of the region, especially in high-income areas along the peninsula and in Silicon Valley. Despite the COVID-19 economic downturn, the resilient regional economy, combined with increased household formation among the millennial generation, has contributed to an ever-more acute housing shortage. In 2022, the Bay Area added approximately 24,000 housing units (Vital Signs 2025a), a fraction of the peaks seen in the 1990s. Between 2010 and 2023, 9,800 new multifamily units were built, accounting for 80% of all new housing (Vital Signs 2025a). Despite a rebound after the COVID-19 pandemic dip, production in the 2020s remains below late 1990s and early 2000s levels. This reflects that the region has not been producing the housing needed to keep up with demand, a consistent trend over the past several decades that has resulted in a generally constrained housing supply (Vital Signs 2025b).

Coastal Bay Land Uses

The California Coastal Commission and the Bay Conservation and Development Commission (BCDC) regulate land use near the coastline and along the bay (respectively) to protect and enhance the coastline and to promote public access within the coastal zone of California. On land, the coastal zone varies in width from several hundred feet in highly urbanized areas to up to 5 miles in certain rural areas, and offshore, the coastal zone extends along a 3-mile-wide band of ocean, as shown in **Figure 3.11-2**. The coastal zone established by the California Coastal Act does not include San Francisco Bay, where development is regulated by BCDC. More information on how these agencies regulate uses near the coast is addressed in the Section 3.11.3, "Regulatory Setting," below.

[1] Vital Signs is a monitoring initiative to track trends related to transportation, land and people, the economy, the environment, and social equity. Led by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), this effort relies upon extensive collaboration with the Bay Area Air Quality Management District, the San Francisco Bay Conservation and Development Commission and the Bay Area Regional Collaborative.

Vital Signs is a data-driven website that compiles dozens of indicators; each is presented with interactive visualizations that allow users to explore historical trends, examine differences between cities and counties, and compare the Bay Area with other peer metropolitan areas. https://www.vitalsigns.mtc.ca.gov/about.

Figure 3.11-2: California Coastal Zone



Sources: TomTom North America 2019; California Coastal Commission 2014.

Parks and Open Space

The Bay Area contains over 1.4 million acres of parks and open space across nine counties (see **Table 3.11-2** and **Figure 3.11-3**). Approximately half of the parks and open space are available for public use (Bay Area Open Space Council 2025), while the remaining half is not available for public use. Although access by the general public to some areas is restricted, these areas are considered important for the preservation of wildlife habitats and the protection of the environmental and rural characteristics of various parts of the region. These areas can be parks, preserves, ranches, farms, or forests and can be small, large, publicly accessible, or not publicly accessible.

Table 3.11-2: Acreage of Parks and Open Space

County	Open Access (acres)	Restricted Access (acres)	No Access (acres)	Total (acres)
Alameda	71,800	35,600	25,500	132,900
Contra Costa	94,600	24,200	49,800	168,600
Marin	159,700	1,800	63,600	225,100
Napa	111,100	27,900	48,200	187,200
San Francisco	5,600	100	100	5,800
San Mateo	57,800	32,500	33,900	124,200
Santa Clara	147,400	53,100	275,100	275,100
Solano	37,800	19,900	42,500	100,100
Sonoma	89,700	36,500	116,500	242,700
Regional Total	775,400	231,500	454,700	1,461,600

Notes: Numbers have been rounded to the nearest 100. Figures may not sum because of independent rounding.
Sources: Bay Area Open Space Council 2025; complied by Ascent in 2025.

3.11.3 Regulatory Setting

FEDERAL REGULATIONS

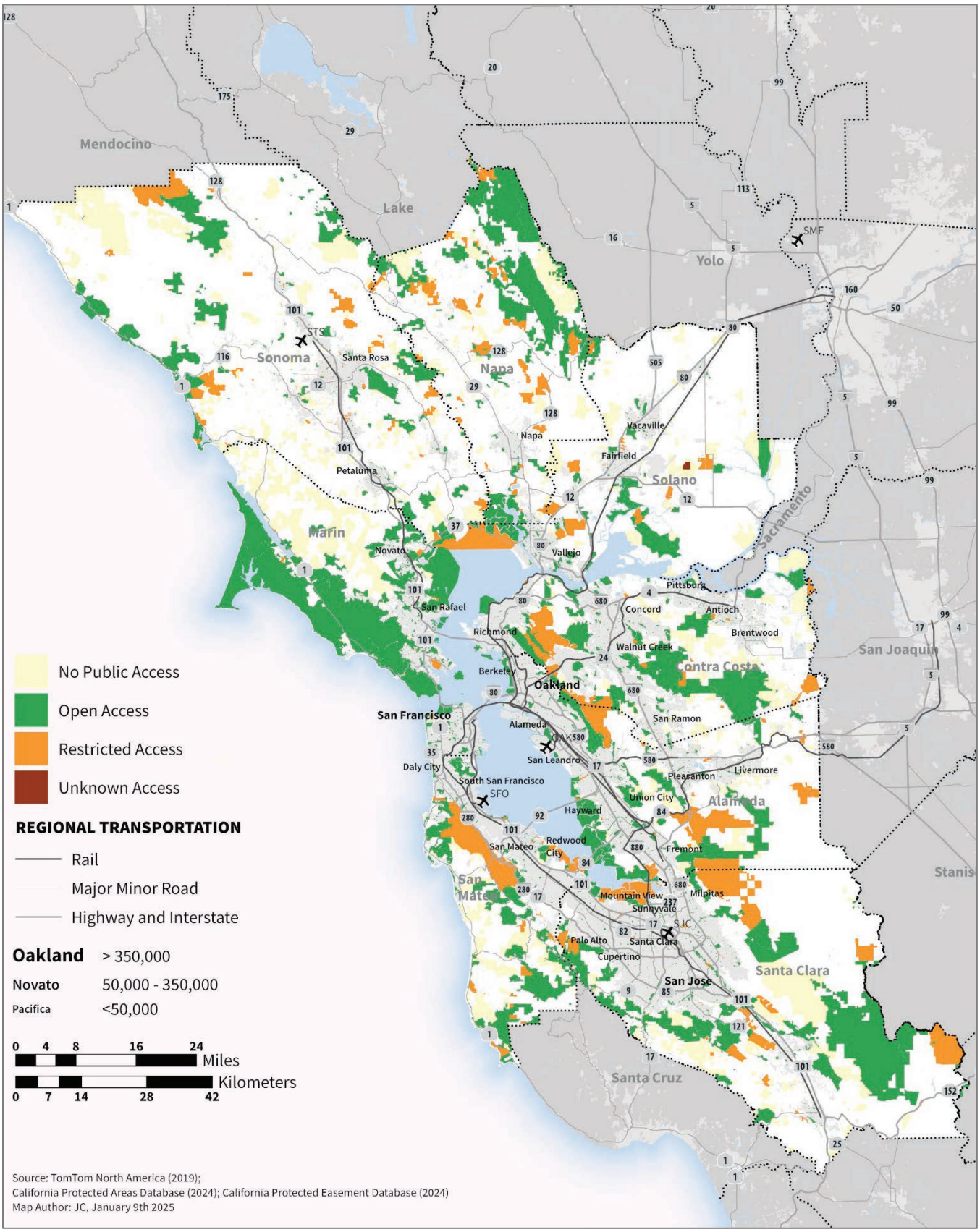
Department of Housing and Urban Development Act

The Department of Housing and Urban Development Act created the US Department of Housing and Urban Development (HUD) as a cabinet-level agency. HUD is responsible for national policy and programs that address housing needs in the United States. HUD is responsible for enforcing fair housing laws. HUD plays a major role in supporting homeownership by underwriting homeownership for lower- and moderate-income families through its mortgage insurance programs.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 US Code Section 4601 et seq.), as amended, is intended to provide for uniform and equitable treatment for persons displaced through federally funded or assisted transportation and redevelopment projects that require property acquisition. The act lays out rules for notification, relocation counseling, social services or assistance for disabled residents, and compensation for replacement housing and moving costs. The rules stipulate that replacement housing must be comparable to previous housing in terms of location, size, and access to jobs and public facilities and that it must be “decent, safe, and sanitary.” The rules apply if federal funds are in any phase of the program or project, even if the property acquisition itself is not federally funded.

Figure 3.11-3: Access to Parks and Open Space Lands



Sources: TomTom North America 2019; California Protected Areas Database 2024; California Conservation Easement Database 2024.

Code of Federal Regulations Title 25

Federally recognized Native American tribes are considered domestic dependent nations with tribal sovereignty. "Tribal sovereignty" refers to tribes' right to govern themselves, define their own membership, manage tribal property, and regulate tribal business and domestic relations; it further recognizes the existence of a government-to-government relationship between such tribes and the federal government. In general, state and local governments do not have "civil regulatory" jurisdiction (i.e., land use) on Indian Land, which is land held in trust or restricted status for a tribe.

Fixing America's Surface Transportation Act (Public Law 114-94)

As noted in Chapter 1, "Introduction," under the Fixing America's Surface Transportation Act (FAST Act), Moving Ahead for Progress in the 21st Century Act (MAP-21), and the Infrastructure Investment and Jobs Act (Public Law 117-58), the US Department of Transportation requires that metropolitan planning organizations (MPOs), such as MTC, prepare long-range RTPs and update them every 4 years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. While the FAST Act is primarily a transportation law, Section 78001 of the act also amended the United States Housing Act of 1937 to allow public housing agencies and owners in the Housing Choice Voucher, Public Housing, and Section 8 Project-Based Rental Assistance programs to eliminate annual income reviews in some years by applying a cost of living adjustment determined by the US Department of Housing and Urban Development Secretary to fixed-income sources for families with incomes that are at least 90% fixed income. The public housing agency or owner is not required to verify nonfixed income amounts in years when no fixed-income review is required but is still required to use third-party documentation for a full income recertification every 3 years.

STATE REGULATIONS

Zenovich–Moscone–Chacon Housing and Home Finance Act of 1975

In response to state population and household growth, and to ensure the availability of affordable housing for all income groups, the California Department of Housing and Community Development (HCD) is responsible for determining the regional housing need for all jurisdictions in California.

Housing Element Law

Enacted in 1969, housing element law (Government Code Sections 65580–65589.8) mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law acknowledges that in order for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing development. As a result, housing policy in the state rests largely upon the effective implementation of local general plans and, in particular, local housing elements. Housing element law also requires HCD to review local housing elements for compliance with state law and to report its written findings to the local government.

Several statutory changes related to state housing element law were enacted January 1, 2018, as part of the 2017 Legislative Housing Package. These changes included Senate Bill (SB) 35 (Chapter 366, Statutes of 2017), which creates a streamlined approval process for specific housing developments in localities that have not yet met their housing targets; AB 1397 (Chapter 375, Statutes of 2017), which requires cities to zone more appropriately for their share of regional housing needs and in certain circumstances requires by-right development; and SB 166 (Chapter 367, Statutes of 2017), which requires a city or county to identify additional low-income housing sites in their housing element when market-rate housing is developed on a site currently identified for low-income housing. Other new/revised statutes address the creation and preservation of affordable housing, housing element accountability and enforcement, and processes to streamline housing development.

Since 2018, additional statutory changes related to state housing element law were enacted to combat California's housing supply shortage. This includes Assembly Bill (AB) 686 (Chapter 368, Statutes of 2017), which creates new requirements for all state and local agencies to ensure that their laws and programs further fair housing. AB 686 also creates new requirements in Housing Element Law including the requirement that all housing elements must include a program that promotes and affirmatively furthers fair housing opportunities for all residents and that all Housing Elements submitted after January 1, 2021 must include an Assessment of Fair Housing consistent with the core elements of the US Department of Housing and Urban Development (HUD) Affirmatively Furthering Fair Housing Final Rule. In addition, other statutory changes include SB 6 (Chapter 659, Statues of 2019) which requires local planning agencies to submit copies of the inventory of land suitable and available for residential development to HUD. AB 1486 expanded on the definition of "local agency" to include sewer, water, utility and local and regional parks, joint power authorities, or other political subdivisions and revised the requirements of the site inventory table of lands suitable for residential development.

California Relocation Assistance Act of 1971

The California Relocation Assistance Act (Government Code Section 7260 et seq.) was passed in 1971, following the Uniform Relocation Assistance and Real Property Acquisition Policies Act in 1970 (see discussion above under "Federal Regulations"). California's version of the law has similar provisions requiring notification, counseling, social services, and financial assistance for persons displaced by transportation and land redevelopment projects. Under the California act, these procedural protections and benefits apply when the project causing the displacement has received state funding during any phase of the program or project, even if it did not receive federal funding.

Regional Housing Needs Allocation

California Government Code Sections 65583(a)(1) and 65584 require that each council of government consult with the California Division of Housing Policy Development and determine each region's existing and projected housing need through preparation of a Regional Housing Needs Allocation (RHNA) that allocates a share of the regional housing need to each city, county, or city and county based on an analysis of population and employment trends and documentation of projections and a quantification of the locality's existing and projected housing needs for all income levels, including extremely low income households, as defined in subdivision (b) of Section 50105 and Section 50106 of the Health and Safety Code.

The future need for housing is determined primarily by the forecasted growth in households in a community, based on historical growth patterns, job creation, household formation rates, and other factors to estimate how many households will be added to each community over the projection period. The housing need for new households is then adjusted to account for an ideal level of vacancy needed to promote housing choice, maintain price competition, and encourage acceptable levels of housing upkeep and repair. The RHNA also accounts for units expected to be lost because of demolition, natural disaster, or conversion to non-housing uses. The sum of these factors—household growth, vacancy need, and replacement need—form the "construction need" assigned to each community. Finally, the RHNA considers how each jurisdiction might grow in ways that will decrease the concentration of low-income households in certain communities. The need for new housing is distributed among income groups so that each community moves closer to the regional average income distribution.

As discussed in Chapter 1, "Introduction," the proposed plan will serve as the fourth RTP/SCS for the Bay Area and is a "limited and focused" update of Plan Bay Area 2050 that does not include a parallel RHNA process, as specified by California statute.

Sustainable Communities and Climate Protection Act of 2008

In 2008, California enacted SB 375 (Chapter 728, Statutes of 2008), which coordinates regional land use and transportation planning through the requirement to adopt an SCS as part of the RTP. The purpose of the SCS is to reduce greenhouse gas (GHG) emissions from cars and light trucks in alignment with GHG targets that are set by the California Air Resources Board (CARB), expressed as a percent change in per capita passenger vehicle GHG emissions. If the SCS does not achieve the GHG emission targets set by CARB, an alternative planning strategy (APS) must be prepared to demonstrate how the targets could be achieved. SB 375 does not require local governments to revise their "land use policies and regulations, including [their] general plan," to be consistent with the SCS (Government Code Section 65080 et seq.) The land use portion of the SCS is implemented through voluntary local government actions.

The SCS also identifies areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the RTP, taking into account net migration into the region, population growth, household formation, and employment growth (Government Code Section 65080). Under SB 375, preparation of the RHNA is coordinated with preparation of the SCS. As discussed above, the proposed plan is a "limited and focused" update of Plan Bay Area 2050 and does not include a parallel RNHA process.

The SCS must:

- identify the general location of land uses, residential densities, and building intensities within the region;
- identify areas within the region sufficient to house all the population of the region;
- identify areas within the region sufficient to house an 8-year projection of the regional housing need;
- identify a transportation network to service the regional transportation needs;
- gather and consider the best practically available scientific information regarding resources areas and farmland in the region; and
- consider the state housing goals; set forth a forecasted development pattern for the region; and allow the RTP to comply with the federal Clean Air Act of 1970 (42 US Code Section 7401 et seq.).

The development pattern in the SCS, when integrated with the transportation network and other transportation measures and policies, must reduce the GHG from automobiles and light-duty trucks to achieve the GHG emission reduction targets approved by the California Air Resources Board (CARB). If the SCS does not achieve the GHG emission targets set by CARB, an alternative planning strategy must be prepared to demonstrate how the targets could be achieved.

The Delta Protection Act of 1992

The Delta Protection Act of 1992 established the Delta Protection Commission, a state entity to plan for and guide the conservation and enhancement of the natural resources of the Delta while sustaining agriculture and meeting increased recreational demand. The act defines a Primary Zone, which comprises the principal jurisdiction of the Delta Protection Commission. The Secondary Zone is the area outside the Primary Zone and within the "Legal Delta"; the Secondary Zone is not within the planning area of the Delta Protection Commission. Portions of Alameda, Contra Costa, and Solano Counties overlap with the Primary Zone. The act requires the Delta Protection Commission to prepare and adopt a land use and resource management plan for the Primary Zone of the Delta, which must meet specific goals.

Sacramento-San Joaquin Delta Reform Act of 2009

The Delta Plan, required by the 2009 Sacramento-San Joaquin Delta Reform Act, creates rules and recommendations to further the state's coequal goals for the Delta: improve statewide water supply

reliability and protect and restore a vibrant and healthy Delta ecosystem. Pursuant to the Delta Plan, these goals should be achieved in a manner that preserves, protects, and enhances the Delta's unique agricultural, cultural, and recreational characteristics.

Public Resources Code Sections 21094.5 and 21094.5.5

PRC Sections 21094.5 and 21094.5.5 (SB 226, Chapter 469, Statutes of 2011) set forth a streamlined review process for infill projects and include performance standards to be used to determine an infill project's eligibility for streamlined review. The intent of PRC Sections 21094.5 and 21094.5.5 is to streamline the environmental review process by "limiting the topics subject to review at the project level where the effects of infill development have been addressed in a planning level decision or by uniformly applicable development policies." Residential, commercial, and retail development, public office buildings, transit stations, and schools are eligible for this streamlining provided they meet the following requirements: (1) are located in an urban area on a site that has been previously developed or adjoins existing qualified urban uses on at least 75% of the site's perimeter; (2) satisfy the performance standards provided in Appendix M of the CEQA Guidelines; and (3) are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy, with some exceptions. Some development and transportation projects included in the proposed plan may be eligible to use a streamlined version of the environmental review process.

Senate Bill 743

SB 743 (2013) (PRC Sections 21099 and 21155.4) created an exemption from CEQA for certain projects that are consistent with a specific plan. (See PRC Section 21155.4.) A specific plan is a local plan that contains specific policies and development regulations for a defined area, such as a downtown core or along a transit corridor. The exemption applies if a project meets all of the following criteria:

- It is a residential, employment center, or mixed-use project.
- It is located within a TPA.
- The project is consistent with a specific plan for which an EIR was certified.
- It is consistent with an adopted SCS or alternative planning strategy.

The exemption cannot be applied if the project would cause new or worse significant environmental impacts compared to what was analyzed in the EIR for the specific plan. If the project would cause new or worse significant environmental impacts, supplemental environmental review must be conducted. SB 743 also specifies that aesthetic and parking impacts of residential, mixed-use residential, or employment center uses on infill sites within a TPA shall not be considered significant effects on the environment (see PRC Section 21099[d]). **Table 1-2** in Chapter 1 describes the SB 375 requirements for CEQA streamlining related to an SCS.

Senate Bill 272 (2023) – "Sea Level Rise Planning and Adaptation"

Signed into law on October 7, 2023, SB 272 requires local governments located wholly or partially within California's coastal zone or within the jurisdiction of the BCDC to develop Local Coastal Programs (LCPs) or Subregional Shoreline Adaptation Plans. SB 272 directs BCDC to create guidelines for preparing these plans within the San Francisco Bay Area and grants BCDC authority to review and approve or deny them based on consistency with the guidelines. Once a plan is approved, the implementing local government becomes eligible for priority funding to carry out sea level rise adaptation strategies and recommended projects identified in the plan. These LCPs or Subregional Shoreline Adaptation Plans are meant to help cities and counties proactively protect residents, infrastructure, and habitats from the effects of sea level rise, both along the outer coast and the bay shoreline.

California Coastal Act

The California Coastal Commission is one of California's three designated coastal management agencies that administer the federal Coastal Zone Management Act (CZMA) in California. In partnership with coastal cities and counties, it plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the CZMA to include (among other activities) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the California Coastal Commission or the local government. CZMA gives state coastal management agencies regulatory control over all activities that may affect coastal resources, including any new developments, and highway improvement projects that use federal funds.

The mission of the California Coastal Commission, established by voter initiative in 1972 and later made permanent by the legislature through adoption of the California Coastal Act of 1976, is to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations. The California Coastal Act includes specific policies that address issues such as shoreline public access and recreation, lower-cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The coastal zone, which was specifically mapped by the legislature, covers an area larger than the state of Rhode Island. On land, the coastal zone varies in width from several hundred feet in highly urbanized areas to up to 5 miles in certain rural areas, and offshore, the coastal zone includes a 3-mile-wide band of ocean. The coastal zone established by the Coastal Act does not include San Francisco Bay, where development is regulated by BCDC.

The California Coastal Commission plans and regulates the use of land and water in the coastal zone in partnership with coastal cities and counties. Development activities are defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, and they generally require a coastal permit from either the Coastal Commission or the local government. Implementation of Coastal Act policies is accomplished primarily through the preparation of local coastal programs (LCPs), which are required to be completed by each of the 15 counties and 60 cities located in whole or in part in the coastal zone. Completed LCPs must be submitted to the California Coastal Commission for review and approval. An LCP includes a land use plan, which may be the relevant portion of the local general plan, including any maps necessary to administer it and the zoning ordinances, zoning district maps, and other legal instruments necessary to implement the land use plan. Coastal Act policies are the standards by which the commission evaluates the adequacy of LCPs, and amendments to certified land use plans and LCPs become effective only after approval by the commission. The California Coastal Commission is required to review each certified LCP at least once every 5 years to ensure that coastal resources are effectively protected in light of changing circumstances.

The Bay Area coastline is part of the North Central Coast Area. As of 2020, LCPs were effectively certified for Sonoma County, Marin County, San Francisco City and County, San Mateo County, Daly City, and the City of Pacifica (certification draft sent to the California Coastal Commission June 2020).

McAteer-Petris Act

BCDC is dedicated to the protection and enhancement of San Francisco Bay and the Suisun Marsh and to the encouragement of their responsible use. As the other designated coastal zone management agency, and pursuant to the McAteer-Petris Act, BCDC is designated as the agency responsible for the protection of the bay and its natural resources and for the regulation of the development of the bay and shoreline to their highest potential with a minimum of bay fill. For development projects, including transportation

projects, BCDC jurisdiction includes the bay itself (including San Pablo and Suisun Bays, sloughs, and certain creeks) and, in general, a 100-foot band along the bay shoreline.

The McAteer-Petris Act further specifies that certain water-oriented land uses should be permitted on the shoreline, including ports, water-related industries, airports, wildlife refuges, water-oriented recreation and public assembly, desalinization plants, and power plants requiring large amounts of water for cooling purposes. BCDC implements the San Francisco Bay Plan (Bay Plan) to control bay filling dredging and shoreline development. To minimize the future filing of the bay, the Bay Plan identifies Priority Use Areas (PUAs), which are reserved for these water-oriented land uses. It is necessary to obtain BCDC approval before undertaking any work within 100 feet of the bay shoreline (including grading); filling of the bay or certain tributaries of the bay; dredging; Suisun Marsh projects; and any filling, new construction, major remodeling, substantial change in use, and many land subdivisions in the bay, along the shoreline, in salt ponds, duck hunting preserves or other managed wetlands adjacent to the bay.

Regional Conservation Investment Strategy Program

AB 2087 (2016) created the California Department of Fish and Wildlife's Regional Conservation Investment Strategy pilot program and was amended by SB 103 on July 21, 2017. The program uses a science-based approach to identify conservation and enhancement opportunities that, if implemented, will help California's declining and vulnerable species by protecting, creating, restoring, and reconnecting habitat and may contribute to species recovery and adaptation to climate change and resiliency. The program consists of three components: regional conservation assessments (RCAs), regional conservation investment strategies (RCISs), and mitigation credit agreements (MCAs). An RCA is a voluntary, nonregulatory, nonbinding conservation assessment that includes information and analyses of important species, ecosystems, protected areas, and habitat linkages at the US Department of Agriculture ecoregion scale and may include more than one ecoregion. An RCIS is a voluntary, nonregulatory, and nonbinding conservation assessment that includes information and analyses relating to the conservation of focal species, their associated habitats, and the conservation status of the RCIS land base. An RCIS establishes biological goals and objectives at the species level and describes conservation actions and habitat enhancement actions that, if implemented, will contribute to those goals and objectives. An MCA is a mitigation credit agreement developed under an approved RCIS. An MCA is developed in collaboration with the California Department of Fish and Wildlife to create mitigation credits by implementing the conservation or habitat enhancement actions identified in an RCIS. The North Bay Baylands RCIS (includes portions of Marin, Napa, Sonoma, and Solano Counties), East Bay RCIS (includes portions of Alameda and Contra Costa Counties), and Santa Clara County RCIS overlap with the plan area.

Quimby Act

The 1975 Quimby Act (California Government Code Section 66477) authorized cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. The act states that the dedication requirement of parkland can be a minimum of 3 acres per thousand residents or more and up to 5 acres per thousand residents if the existing ratio is greater than the minimum standard. Revenues generated through in-lieu fees collected under the Quimby Act cannot be used for the operation and maintenance of park facilities. In 1982, the act was substantially amended. The amendments further defined acceptable uses of and restrictions on the use of Quimby Act funds, provided acreage/population standards and formulas for determining the exaction, and indicated that the exactions must be closely tied to a project's impacts as identified through studies required by CEQA.

State Open Space Standards

State planning law (Government Code Section 65560) provides a structure for the preservation of open space by requiring every city and county in the state to prepare, adopt, and submit to the Secretary of the Resources Agency a "local open-space plan for the comprehensive and long-range preservation and

conservation of open-space land within its jurisdiction." The following open space categories are identified for preservation:

- **open space for public health and safety,** including, but not limited to, areas that require special management or regulation because of hazardous or special conditions;
- **open space for the preservation of natural resources,** including, but not limited to, natural vegetation, fish and wildlife, and water resources;
- **open space for resource management and production,** including, but not limited to, agricultural and mineral resources, forests, rangeland, and areas required for the recharge of groundwater basins;
- **open space for outdoor recreation,** including, but not limited to, parks and recreational facilities, areas that serve as links between major recreation and open space reservations (such as trails, easements, and scenic roadways), and areas of outstanding scenic and cultural value; and
- **open space for the protection of Native American sites,** including, but not limited to, places, features, and objects of historical, cultural, or sacred significance, such as Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines located on public property (further defined in PRC Sections 5097.9 and 5097.993).

State Public Park Preservation Act of 1971

The primary instrument for protecting and preserving parkland is the State Public Park Preservation Act of 1971 (PRC Sections 5400–5409). Under the act, cities and counties may not acquire any real property that is in use as a public park for any nonpark use unless compensation or land, or both, are provided to replace the parkland acquired. This ensures no net loss of parkland and facilities.

REGIONAL AND LOCAL REGULATIONS

In accordance with Government Code Section 65584(a), ABAG has been designated by the state and federal governments as the official comprehensive planning agency for the Bay Area. ABAG reviews projects of regional significance for consistency with regional plans. Plan Bay Area 2050+ provides a policy guide for planning the region's housing, economic development, environmental quality, transportation, recreation, and health and safety.

MTC Resolution 3434 Transit Oriented Development Policy for Regional Transit Expansion Projects

MTC adopted a Transit Oriented Development (TOD) Policy (Resolution 3434) in 2005 to support the development of communities around new transit lines and stations identified as part of the Resolution 3434 Regional Transit Expansion Program. Resolution 3434 is intended to improve the cost-effectiveness of regional investments in new transit expansions to ease the Bay Area's chronic housing shortage, create vibrant new communities, and help preserve open space through ensuring that new development patterns are more supportive of transit. The three key elements of the regional TOD policy are:

- corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors;
- local station area plans that address future land use changes, station access needs, circulation improvements, pedestrian-friendly design, and other key features in a TOD; and
- corridor working groups that bring together congestion management agencies (CMAs), city and county planning staff, transit agencies, and other key stakeholders to define expectations, timelines, roles and responsibilities for key stages of the transit project development process.

TOD policy application applies only to physical transit extensions funded in Resolution 3434 with regional discretionary funds (as defined in the policy guidelines), regardless of the level of funding. However, single-station extensions to international airports are not subject to the TOD policy because of the infeasibility of housing development. The implementation process of the TOD policy involved coordination with the transit agency, city, MTC, CMA, and ABAG to determine thresholds for station areas and housing. Each transit extension project funded in Resolution 3434 must determine corridor-level thresholds, which may vary by modes of transit, in the form of minimum number of housing units along the corridor. Along with determining thresholds, each physical transit extension project seeking funding from Resolution 3434 must demonstrate that the thresholds for the corridor are met through existing development and adopted station area plans that commit local jurisdictions to a level of housing that meets the threshold.

MTC Resolution 4530 Transit-Oriented Communities Policy

On September 28, 2022, MTC adopted the Transit-Oriented Communities (TOC) Policy (MTC Resolution 4530) to support the region's transit investments by creating communities around transit stations and along transit corridors that not only enable transit ridership, but also are places where Bay Area residents of all abilities, income levels, and racial and ethnic backgrounds can live, work, and access services. The TOC Policy grew out of Plan Bay Area 2050, the region's currently adopted long-range regional plan. Compliance with the TOC Policy is voluntary for jurisdictions that want to advance the goals of the long-range plan or to be eligible and/or competitive for some MTC discretionary funding.

The TOC Policy applies to areas within one half-mile of the following types of existing and planned fixed-guideway transit stops and stations: regional rail, commuter rail, light-rail transit, bus rapid transit, and ferries. The policy requirements consist of the following four elements:

1) minimum required and allowed residential and/or commercial office densities for new development;
2) policies focused on housing production, preservation and protection, and commercial anti-displacement and stabilization polices;
3) parking management; and
4) transit station access and circulation.

One Bay Area Grant Program

MTC's One Bay Area Grant program (OBAG) is a funding approach that aligns MTC's investments with support for focused growth. Established in 2012, OBAG taps federal funds to maintain MTC's commitments to regional transportation priorities while also advancing the Bay Area's land use and housing goals. OBAG includes both a regional program and a county program that:

- targets project investments in PDAs and
- rewards cities and counties that approve new housing construction and accept allocations through the RHNA process.

Cities and counties can use these OBAG funds to invest in:

- local street and road maintenance,
- streetscape enhancements,
- bicycle and pedestrian improvements,
- transportation planning,
- Safe Routes to School projects, and
- PCAs.

OBAG is currently in its third iteration. The third round of OBAG funding was adopted by MTC in January 2022 and includes more than $750 million in federal funding for projects from 2023 to 2026.

California Government Code, Section 56000

Each county in California has a local agency formation commission (LAFCO), which is the agency that has the responsibility to create orderly local government boundaries, with the goals of encouraging the orderly formation of local governmental agencies and the preservation of open space lands and discouraging urban sprawl. LAFCOs are governed by Section 56000 of the California Government Code. This legislation sets the commission's powers and duties, procedures for establishing and changing governmental boundaries, and other statewide policies that LAFCOs must consider while making their determinations. While LAFCOs have no direct land use power, their actions determine which local government will be responsible for planning new areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influences for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolutions of cities.

City and County General Plans

The most comprehensive land use planning for the San Francisco Bay Area region is provided by city and county general plans, which local governments are required by state law (California Government Code Section 65300 et seq.) to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by state law or that the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, and/or growth management. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas). Issues pertaining to land use are described in the land use element, issues pertaining to agricultural and forest resources are described in the conservation element, and issues pertaining to open space are described in the open space element of general plans.

Specific and Master Plans

A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These plans are more localized and provide focused guidance for developing a specific area, including development standards tailored to the area, and systematic implementation of the general plan.

Delta Plan

The Delta Reform Act of 2009 (Water Code Section 85000 et seq.) established the Delta Stewardship Council (Council) and charged it with furthering California's coequal goals of providing a reliable water supply and protecting, restoring, and enhancing the Sacramento–San Joaquin River Delta (Delta) ecosystem, in a manner that protects and enhances the Delta's cultural, recreational, natural resource, and agricultural values.

To achieve these objectives, the Council developed and adopted the Delta Plan (23 CCR Sections 5001 et seq.), which contains regulatory policies and recommendations. A state or local agency that proposes to undertake a "covered action" must certify consistency with the Delta Plan before implementing the project. A "covered action" is a project that (1) would occur, in whole or in part, in the Delta or Suisun Marsh; (2) is carried out, approved, or funded by a state or local agency; (3) is covered by one or more provisions of the Delta Plan; and (4) would have a significant impact on achieving one or both of the coequal goals or on implementing a government-sponsored flood-control program to reduce risks to people and property in the Delta (Water Code Section 85057.5).

Portions of Contra Costa, Solano, and Alameda Counties (among others) lie in or partially in the Delta. Projects or programs in these areas may be subject to one or more Delta Plan policies. Of note is Delta Plan Policy DP P1 (23 CCR Section 5010), which limits new urban development in the Delta to areas designated for that use (as of May 16, 2013, or within the 2006 voter-approved urban limit line for Contra Costa County). Where a land use proposed by the plan (or associated transportation) project could expand urban development into the Delta, it should demonstrate consistency with Delta Plan Policy DP P1 to avoid conflicts with Delta Plan regulations.

The plan is not itself a "covered action," but future actions proposed or funded by local or regional agencies in areas that overlap with the Delta must demonstrate consistency with the Delta Plan if they qualify as "covered actions" (Water Code Section 85225). Where an action is consistent with the plan and no net increase in vehicle miles traveled emissions under SB 375 targets is achieved, it may be eligible for the Water Code Section 85057.5, subdivision (b)(4), exception.

Additionally, Water Code Section 85212 requires a metropolitan planning organization preparing a regional transportation plan or sustainable communities strategy that includes any land within the primary or secondary zones of the Delta (i.e., the Sacramento–San Joaquin Delta or Suisun Marsh) to consult with the Council regarding policy choices relating to the consistency of its plan with the Delta Plan.

The Delta Reform Act requires the Council to review the Delta Plan at least once every five years, and the Council may revise the Delta plan as it deems appropriate. The most recent five-year review of the Delta Plan was completed in 2024 and includes the following recommendations (Delta Stewardship Council 2024):

- Reduce reliance on Delta water
- Accelerate ecosystem restoration
- Accelerate subsidence reversal efforts
- Promote Delta recreation and tourism
- Improve State and federal assurances for Delta levees
- Consider and implement performance measures updates
- Implement the Delta levees investment strategy
- Consider the impacts and benefits of capturing and storing carbon
- Conduct covered action early consultation and post-project updates
- Improve the use of the best available science in certifications of consistency
- Enhance adaptive management plans
- Develop a 'Delta as an Evolving Place Facing Rapid Change' report
- Implement new climate adaptation and tribal and environmental justice recommendations as directed by the Council

San Francisco Bay Area Seaport Plan

The San Francisco Bay Conservation and Development Commission (BCDC) developed the San Francisco Bay Area Seaport Plan in 1996, last amended in 2012, to forecast cargo activity, assess port terminal handling capacity, and coordinate port area development. The plan assists in coordinating Bay Area maritime activities with the region's surface transportation system. The plan uses Port Priority Use Areas as a land use designation for port development planning and establishing policies to achieve goals for the port system and surrounding areas. However, the projections and plan horizon was 2020, and BCDC is in the process of updating the plan.

BCDC Regional Shoreline Adaptation Plan

The BCDC Regional Shoreline Adaptation Plan (RSAP), developed in response to SB 272 (2023), is a component of the Bay Plan that provides guidance on land use planning in areas vulnerable to sea level rise. The RSAP is designed to support Bay Area local governments and communities in integrating shoreline adaptation strategies into their land use plans, zoning, and development regulations. It promotes safe, sustainable, and strategic shoreline growth, ensuring that future development in areas subject to coastal and groundwater rise is resilient and aligned with regional adaptation efforts.

The RSAP guidelines emphasize the importance of incorporating nature-based solutions, coordinated land use planning across jurisdictions, and phased adaptation strategies to accommodate future changes in sea level and storm surge risks. Local jurisdictions within BCDC's jurisdiction must consider RSAP guidance when developing or updating their general plans, Local Coastal Programs (LCPs), and zoning codes to ensure consistency with regional adaptation priorities (BCDC 2024).

Zoning

The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan (California Government Code Section 65860).

Urban Growth Boundaries

Local growth control endeavors to manage community growth by various methods, including tying development to infrastructure capacity or traffic level of service standards, limiting the number of new housing units, setting limits on the increase of commercial square footage, linking development to a jobs-to-housing balance, and adopting urban growth boundaries. These goals and others can be achieved through the adoption of a countywide growth management program. Growth management programs, including those related to adopting urban growth boundaries, have been implemented by county government and/or cities in all of the nine Bay Area counties. The cities within the region that have implemented urban growth boundaries are summarized in **Table 3.11-3**.

Table 3.11-3: Bay Area Urban Growth Boundaries

County	Cities with an Urban Growth Boundary
Alameda	Dublin, Fremont, Hayward, Livermore, Pleasanton
Contra Costa	Antioch, Danville, El Cerrito, Hercules, Martinez, Oakley, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, Walnut Creek
Marin	Novato
Napa	American Canyon, Napa, St. Helena, Yountville
San Francisco	--
San Mateo	Urban-Rural Boundary applies to all jurisdictions in the County
Santa Clara	Cupertino, Gilroy, Los Gatos, Milpitas, Morgan Hill, Palo Alto, San José
Solano	Benicia, Fairfield, Rio Vista, Vallejo, Vacaville
Sonoma	Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, Windsor

Notes: San Francisco has no affected farmland acres.
Source: Greenbelt Alliance 2020.

3.11.4 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- physically divide an established community (Criterion LU-1);
- cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect (Criterion LU-2);
- induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) (Criterion LU-3); or
- displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere (Criterion LU-4).

METHOD OF ANALYSIS

This program-level EIR evaluates potential impacts on land use, population, and housing based on the location of the proposed plan's footprint associated with the land use growth footprint, sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint) relative to the known distribution of land use, population, and housing throughout the Bay Area. The baseline for the following analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025.

Quantitative results are presented for the region (i.e., the entire footprint, often summarized by county).

For this impact assessment, a geographic information system (GIS) was used to digitally overlay the proposed plan's footprints associated with forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects onto parks and open space, BCDC's Priority Use Areas, Delta Plan/Primary Zone, and the coastal zone.

This evaluation of land use, population, and housing impacts assumes that construction and development under the proposed plan would adhere to applicable federal, state, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts. Land use impacts related implementation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects would be inherently operational in nature, and the following analyses discuss effects of the proposed plan following implementation. Therefore, construction impacts are not addressed separately. The physical effects of future construction are addressed in the other EIR technical sections. For additional information on analysis methodology, refer to Section 3.1, "Approach to the Analysis."

Residential Displacement

This assessment evaluates potential direct impacts to existing communities, including potential displacement of residents, as a result of the forecasted development pattern and transportation projects. This analysis provides a qualitative approach to address effects of implementation of the proposed plan.

The Equity Report (which is available as a supplemental report to proposed plan) provides an analysis of risk of displacement; this information was used in consideration of potential plan effects.

CEQA requires analysis and mitigation of potentially substantial adverse changes in the physical environment (PRC Sections 21151, 21060.5, and 21068). "Economic and social changes resulting from a project are not treated as significant environmental effects [citation] and, thus, need not be mitigated or avoided under CEQA." (*San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 209 Cal.App.3d 1502, 1516.). Physical changes in the environment caused by economic or social effects of a project may constitute significant environmental effects (CEQA Guidelines Sections 15131 and 15064[e)]. Social and economic effects in and of themselves, however, are not significant effects on the environment under CEQA (*Melom v. City of Madera* [2010] 183 Cal.App.4th 41, 55).

Consistency with Local Growth Controls

The EIR qualitatively evaluates local and sub-regional growth controls and the potential impacts of the proposed plan on those efforts, including:

- general plan policies and development controls that require voter approval (such as those set by initiative),
- general plan policies and development controls based on joint powers agreements (such as regional open space reserves, buffers between communities, or urban service boundaries and urban limit lines), and
- general plan policies and development controls reflecting infrastructure constraints or severe environmental constraints.

Local jurisdictions are responsible for adopting land use policies as part of their general and neighborhood plans and implementing them through local ordinance. As a result, MTC and ABAG have no direct control over local land use planning, nor does SB 375 require that local jurisdictions align their general plans to conform to the proposed plan; this alignment is discretionary but encouraged through the availability of streamlined environmental review for consistent projects. MTC's OBAG targets federal transportation funds to projects in PDAs to support the proposed plan's focused growth approach.

IMPACTS AND MITIGATION MEASURES

Impact LU-1: Physically divide an established community (PS)

Land Use Impacts

The proposed plan must accommodate the people, households, and jobs identified in the regional growth forecast. To do this, the proposed plan designates Growth Geographies as areas prioritized to accommodate the forecasted regional growth. The proposed plan's core growth approach is to focus growth within existing communities along the established transportation network. This reflects the foundational and regional growth pattern established in the original Plan Bay Area (2013), Plan Bay Area 2040 (2017), and Plan Bay Area 2050 (2021). Urbanization—in this context defined as development on land not designated as urban built-up land according to the FMMP—is forecasted to occur on approximately 8,100 acres, representing 23% of the land use growth footprint, as described in Section 2.2.3, "Conditions Under the Proposed Plan." The greatest amount of urbanization is forecasted to occur in Contra Costa County (4,100 acres), followed by Solano and Alameda Counties (see Impact AGF-1 in Section 3.3, "Agriculture and Forestry Resources").

The majority (77%) of the proposed plan's land use growth footprint would occur on land identified by the FMMP as urban built-up. The proposed plan's strategies and Growth Geographies would create more

centralized residential areas and commercial centers. Development and redevelopment to accommodate the regional growth forecast would typically occur on vacant or underutilized sites. Therefore, the land use growth footprint would not result in the physical division of established communities. Rather, development would be integrated into established communities. Therefore, this impact would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

The proposed plan's sea level rise adaptation projects footprint would include a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates that would be located along the shoreline edges of existing communities. This infrastructure is not anticipated to physically divide established communities by creating a physical barrier between existing established communities. The sea level rise adaptation projects would protect established shoreline communities from sea level rise. Sea level rise adaptation projects would be required to conform to land use restrictions detailed in the Bay Plan or applicable LCP. In cases where the sea level rise adaptation projects footprint overlaps a PUA, the uses within the PUA must be consistent with Bay Plan requirements.

Section 3.13, "Public Services and Recreation," addresses the potential for the proposed plan to divide shoreline communities, which would affect residents' access to regionally important water (e.g., shoreline parks and trails, water-related recreation, ports, and water-related industry). The potential for sea level rise adaptation projects to physically divide an established community would be less than significant (LTS).

Transportation System Impacts

The proposed plan includes a variety of transportation projects and programs, including regional transit projects, local transit projects, road pricing improvements, and highway and roadway improvement projects. Most of the major proposed transportation projects would be located in existing rights-of-way, meaning they would not create a new physical division within existing communities. Some projects in the proposed plan could improve or expand interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Examples include bridges or undercrossings (with bike lanes) of commuter rail lines, bicycle/pedestrian overcrossings of freeways, and urban trail and pathway projects. Additionally, many proposed projects, such as expansion of transit services, are intended to improve mobility and accessibility and may, as a result, improve community connectivity. However, larger infrastructure projects, such as new above ground rail stations or transit service projects, may require the acquisition of land in existing communities, which may divide established communities. These transportation projects would require subsequent project-level environmental review prior to their implementation. Detailed project design or specific plans could address potential divisions of existing communities. For example, the proposed plan includes several interchange improvements projects to improve pedestrian/bike connectivity and access across freeways. In addition, as discussed in Section, 3.15 "Transportation," MTC has a Complete Streets policy under Resolution 4493 (adopted in 2022) requiring that all projects funded with regional funds consider the accommodation of pedestrians, cyclists, and public transit users, and drivers as part of project planning, design, funding, and construction. Compliance with Resolution 4493 would enhance access and connections within existing communities.

Through regional programs such as OBAG, MTC and ABAG would continue to support planning efforts for locally sponsored traffic calming and alternative transportation initiatives, such as paths, trails, overcrossings, bicycle plans, that foster improved neighborhoods and community connections. However, MTC and ABAG cannot require local implementing agencies to implement these projects. Project approval would remain subject to the discretion of local agencies. Transportation project impacts related to division of an established community would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's land use strategies would result in future development being integrated into existing communities along the existing transportation network and would therefore not physically divide established communities. Sea level rise adaptation projects would primarily be located along the shoreline or other waterways, which would limit the potential for these projects to physically divide an established community. Many proposed transportation projects, such as expansion of transit services or the building of active transportation infrastructure, are intended to improve mobility and accessibility and may, as a result, improve community connectivity. However, larger infrastructure projects, such as new rail stations or services projects, may require the acquisition of land in existing communities, which may divide established communities. As a result, this impact would be **potentially significant (PS)**. Mitigation Measure LU-1 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure LU-1 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- Orient transportation projects to minimize impacts on existing communities by:
  - selecting alignments within or adjacent to existing public rights-of-way;
  - designing sections above or below grade to maintain viable vehicular, cycling, and pedestrian connections between portions of communities where existing connections are disrupted by the transportation project; and
  - wherever feasible incorporating direct crossings, overcrossings, or undercrossings at regular intervals for multiple modes of travel (e.g., pedestrians, bicyclists, vehicles).

Where it has been determined that it is infeasible to avoid creating a barrier in an established community, encourage implementing agencies to consider other measures to reduce impacts, including but not limited to:

- shifting alignments to minimize the area affected;
- reducing the proposed right-of-way take to minimize the overall area of impact; and
- providing for bicycle, pedestrian, and vehicle access across improved roadways.

Significance after Mitigation

Implementation of Mitigation Measure LU-1 would reduce the potentially significant impact of division of an established community because it would implement design features that would improve access and connections within existing communities and to public transit, which would reduce the effects of separation on existing communities. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, because sites are unique, it cannot be concluded with certainty that all potentially significant divisions of established communities could be avoided. This impact would remain **significant and unavoidable (SU)**.

Impact LU-2: Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect (LTS)

Land Use Impacts

General Plans and Specific Plans

The proposed plan's land use strategies are designed to accommodate the region's forecasted growth of 1million households and 1.4 million jobs from 2020 through 2050. Strategy H3, "Allow a Greater Mix of Housing Densities and Types in Growth Geographies," would call for increased density and intensity of development in many designated Growth Geographies compared to that currently planned for and/or allowed by the local jurisdictions. Local lead agencies would determine consistency with adopted general plans and specific plans by conforming the projects or amending land use designations. If the lead agency wishes to approve a project that is consistent with the proposed plan and take advantage of streamlined environmental review, but the project is inconsistent with an adopted general plan or specific plan, project approval would include amendment of the general plan or specific plan.

The proposed plan contains strategies to guide anticipated population, households, and employment growth in the plan area by 2050. The land use strategies were developed as a result of MTC's bottom-up planning process outlined in the proposed plan. This process involved extensive outreach to and input from local jurisdictions, including counties and local city planners. The plan builds on assumptions drawn from local general plans and input from local governments and transportation agencies. SB 375 does not, however, require the plan to be consistent with local land use policies, regulations, or general plans. Additionally, although the land use strategies included in the plan are generally compatible with county- and regional-level general plans, local general plans are not required to incorporate plan strategies. Therefore, it is possible that there could be inconsistencies with existing general plans in the region.

For example, two of the proposed plan's environmental strategies—Strategy EN4, "Maintain Urban Growth Boundaries," and Strategy EN5, "Protect and Manage High-Value Conservation Lands"—expand access to parks and open space and seek to reduce conflicts with applicable open space protection policies by focusing new growth in existing urban areas to help preserve natural areas. Furthermore, Strategy EN6, "Expand Urban Greening in Communities" (formerly "Modernize and Expand Parks, Trails, and Recreation Facilities)," would invest in parks, trails, and open spaces to expand access across the region. However, portions of the proposed plan's land use growth footprint (approximately 45,000 acres) could overlap with open space/parklands, thus conflicting with local policies to preserve parks and open space. The largest overlaps are anticipated in Contra Costa, Solano, and San Francisco Counties (**Table 3.11-4**). The proposed plan also includes Strategy H3, "Allow a Greater Mix of Housing Densities and Types in Growth Geographies," and Strategy H6, "Transform Aging Malls and Office Parks into Neighborhood." Implementation of Strategy H3 and Strategy H6 would have the potential to result in incompatibility with existing general plans because these strategies promote housing that may be more dense or otherwise inconsistent with previously adopted plans.

While deviations from local policies intended to mitigate environmental effects may occur under the proposed plan, such incompatibilities would be resolved as projects are entitled at the local level. As discussed above, local general plans are not required to incorporate the proposed plan strategies. However, implementation of the plan within local jurisdictions through approval of projects that are consistent with the plan may require that local general plans be amended to allow development of the proposed project. Future development consistent with the plan would be required to demonstrate consistency with local general plans or specific plans as part of the development review process for individual projects. Furthermore, the plan's strategies generally seek to minimize environmental effects by encouraging growth in areas that are already largely developed. Therefore, implementation of the land use growth footprint would not conflict with local land use plans and policies intended to mitigate environmental effects.

Table 3.11-4: Acreage of Land Use Growth Footprint within Parks and Open Space

County	Total (acres)
Alameda	50
Contra Costa	530
Marin	< 1
Napa	30
San Francisco	100
San Mateo	10
Santa Clara	140
Solano	210
Sonoma	50
Regional Total	1,120

Notes: numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: GreenInfo Network 2024a, 2024b; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Local Coastal Programs

Sonoma County, Marin County, the City and County of San Francisco, San Mateo County, and the cities of Daly City, Pacifica, and Half Moon Bay all have certified LCPs. As calculated using a GIS-based overlay analysis, the land use growth footprint overlaps with areas of the Coastal Zone in approximately 80 acres in San Mateo County, 10 acres in San Francisco County, 7 acres in Sonoma County, and 4 acres in Marin County. Development that occurs within the Coastal Zone would be subject to the respective LCP. LCPs contain, generally, a land use plan, development code, and policy and zoning maps. Development in the coastal zone is subject to a coastal development permit when there would be change in the use of land or water. The overall goal of applying for and receiving a coastal development permit is to ensure that a project is consistent with the Coastal Act, and by extension LCPs. Although portions of the land use growth footprint overlap with the Coastal Zone, future development would be required to demonstrate consistency with the respective LCPs and satisfy mitigation requirements through the coastal development permit process. Therefore, implementation of the land use growth footprint would not conflict with LCPs.

BCDC

The Bay Plan establishes policies to guide the use of San Francisco Bay and its shoreline. In particular, BCDC, which is responsible for implementation of the Bay Plan, is authorized to control both bay filling/dredging and shoreline development. To minimize the future filling of the bay, the Bay Plan identifies PUAs, which are reserved for water-oriented land uses including ports, water-related industries, airports, wildlife refuges, water-oriented recreation and public assembly, desalinization plants, and power plants requiring large amounts of water for cooling purposes.

Regionally, overlap between PUAs and the land use growth footprint is approximately 1,500 acres. As shown in **Table 3.11-5**, the overlap is greatest in Alameda and Contra Costa Counties. Individual projects that overlap with PUAs would be required to conform to land use restrictions detailed in the Bay Plan. Generally, implementation of the proposed plan is intended to result in development of communities that would complement transportation systems; however, some of the proposed uses in the projected development area may conflict with BCDC land use policies. In cases where the projected development area overlaps a PUA, the uses within the PUA must be consistent with Bay Plan requirements. Land use compatibility would be further addressed during subsequent environmental review as individual projects are implemented and detailed project design or specific plans resolve land use inconsistencies. This would include consideration

of zoning and land use designation amendments, as appropriate, to allow for implementation of a specific project. Although portions of the land use growth footprint overlap with the PUAs, future development would be required to demonstrate consistency with the Bay Plan and satisfy mitigation requirements as part of the local review process for individual projects. Therefore, implementation of the land use growth footprint would not conflict with the Bay Plan.

Table 3.11-5: Acreage of Land Use Growth Footprint within BCDC's Priority Use Areas

County	Total (acres)
Alameda	840
Contra Costa	300
Marin	< 1
Napa	0
San Francisco	160
San Mateo	20
Santa Clara	130
Solano	50
Sonoma	0
Regional Total	1,500

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Sources: GreenInfo Network 2024a, 2024b; BCDC 2020; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Delta Plan

Portions of Alameda, Contra Costa, and Solano Counties overlap with areas covered by the Delta Plan. The Delta Plan encompasses the Primary and Secondary Zones of the Sacramento–San Joaquin Delta as well as the Suisun Marsh. The boundaries, which are described in Delta Plan Policy DP P1, Locate New Urban Development Wisely (23 CCR Section 5010), are intended to strengthen existing Delta communities while protecting farmland and open space, providing land for ecosystem restoration needs, and reducing flood risk. Delta Plan Policy DP P1 is consistent with the Delta Reform Act (PRC Section 29702), which states that one of the basic goals of the State for the Delta is to "[p]rotect, maintain, and, where possible, enhance and restore the overall quality of the Delta environment, including, but not limited to, agriculture, wildlife habitat, and recreational activities." Projected development could affect consistency with the Delta Plan adopted by the Delta Stewardship Council if projects could expand urban development into the Delta. In order to be consistent with Delta Plan Policy DP P1, new residential, commercial, or industrial development is permitted outside the urban boundaries only if it is consistent with the land use designated in the relevant county general plan as of the date of the Delta Plan's adoption (January 2019). Jurisdictions with land in the Primary Zone are required by PRC Section 29763 to adopt general plans with land uses consistent with the goals and policies in the Delta Plan, subject to review by the Delta Stewardship Council. Therefore, subsequent projects within the proposed plan that fall within the Delta Plan boundaries would be required to demonstrate consistency with the plan and satisfy mitigation requirements.

Sea Level Rise Adaptation Impacts

General Plans and Specific Plans

Implementation of the proposed adaption projects would affect shoreline development as compared to that planned for/allowed by the local jurisdiction. Development that occurs within land subject to adopted general plans and specific plans would be subject to the respective land use designations. Local lead agencies would determine consistency with adopted general plans and specific plans by conforming the

projects or amending land use designations. The bay shoreline includes large areas of open space in parks and wildlife refuges. Implementation of the proposed plan would have a potential to result in conflicts with open space/parklands protection policies. Portions of the proposed plan's sea level rise adaptation projects footprint (approximately 43,730 acres) would overlap with open space/parklands. The largest overlaps are anticipated in Sonoma, Santa Clara, and Alameda Counties (**Table 3.11-6**). As discussed under "Land Use Impact," local general plans are not required to incorporate the proposed plan strategies. However, future sea level rise adaptation projects in the plan area would be required to demonstrate consistency with local general plans or specific plans or request and receive approval of plan amendments to achieve consistency as part of the development approval process for individual projects. Therefore, implementation of the sea level rise adaptation projects footprint would not conflict with local general plans or specific plans.

Table 3.11-6: Acreage of Sea Level Rise Adaptation Projects Footprint within Parks and Open Space

County	Total (acres)
Alameda	4,900
Contra Costa	830
Marin	9,100
Napa	2,600
San Francisco	300
San Mateo	3,600
Santa Clara	5,500
Solano	4,100
Sonoma	12,800
Regional Total	43,730

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Sources: California Conservation Easement Database 2023; California Protected Areas Database 2023; data compiled by MTC and ABAG in 2025.

Local Coastal Programs

Sonoma County, Marin County, the City and County of San Francisco, San Mateo County, and the cities of Daly City, Pacifica, and Half Moon Bay all have certified LCPs. As calculated using a GIS-based overlay analysis, the sea level rise adaptation projects footprint overlaps with areas of the Coastal Zone in approximately 1,500 acres in Marin County, 220 acres in San Francisco County, and 2,700 acres in San Mateo County. Development that occurs within the Coastal Zone would be subject to the respective LCP. LCPs contain, generally, a land use plan, development code, and policy and zoning maps. Development in the coastal zone is subject to a coastal development permit when there would be change in the use of land or water. The overall goal of applying for and receiving a coastal development permit is to ensure that a project is consistent with the Coastal Act and, by extension, LCPs. Future sea level rise adaption projects would be required to demonstrate consistency with the respective LCPs and satisfy mitigation requirements through the coastal development permit process. Therefore, implementation of the sea level rise adaptation projects footprint would not conflict with LCPs. BCDC

The Bay Plan establishes policies to guide the use of San Francisco Bay and its shoreline. In particular, BCDC, which is responsible for implementation of the Bay Plan, is authorized to control both bay filling/dredging and shoreline development. To minimize the future filling of the bay, the Bay Plan identifies PUAs, which are reserved for water-oriented land uses including ports, water-related industries, airports, wildlife refuges, water-oriented recreation and public assembly, desalinization plants, and power plants requiring large amounts of water for cooling purposes.

Regionally, overlap between PUAs and the sea level rise adaptation projects footprint is approximately 29,100 acres. As shown in **Table 3.11-7**, the overlap is greatest in Sonoma, Santa Clara, Alameda, Solano, Marin, San Mateo, and Contra Costa Counties. Individual projects that overlap with PUAs would be required to conform to land use restrictions detailed in the Bay Plan. Generally, implementation of the proposed plan is intended to result in shoreline adaptation that maximizes use of green archetypes and maintains or provides access to shoreline PUAs. In cases where the projected footprint associated with sea level rise adaptation projects footprint overlaps a PUA, the uses within the PUA must be consistent with Bay Plan requirements. Although portions of the sea level rise adaptation projects footprint overlap with the PUAs, further sea level rise adaptation projects would be required to demonstrate consistency with the Bay Plan as part of the development review process for individual projects. Therefore, implementation of the sea level rise adaptation projects footprint would not conflict with the Bay Plan.

Table 3.11-7: Acreage of Sea Level Rise Adaptation Projects Footprint within BCDC's Priority Use Areas

County	Total (acres)
Alameda	3,700
Contra Costa	1,300
Marin	3,700
Napa	880
San Francisco	230
San Mateo	2,800
Santa Clara	5,500
Solano	3,100
Sonoma	7,900
Regional Total	29,100

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.
Source: BCDC 2020; data compiled by MTC and ABAG in 2025.

Transportation System Impacts

General Plans and Specific Plans

The majority of proposed transportation projects were nominated by local jurisdictions and may already exist in local or Countywide Transportation Plans. While it is not anticipated that the proposed plan's transportation strategies would conflict with local general plans, where inconsistencies could occur local agencies could amend their general plans to be consistent with the proposed plan. Transportation projects that require the expansion of existing, or designation of new, rights-of-way have the potential to result in direct and indirect effects on open space/parkland—conversion, fragmentation, and use conflicts—similar to those of the land use growth footprint. Generally, to minimize environmental impacts and project costs, it is common practice to design the footprint of new transportation projects within existing rights-of-way as much as feasible. This practice is assumed as a part of this analysis. However, development of some projects, such as roadway widening, roadway extension, and transit expansion projects, could result in the disturbance and/or loss of open space / parkland. The proposed plan's transportation projects footprint has the potential to convert approximately 370 acres of parks and open space. The largest overlaps are anticipated in Alameda and Solano Counties (**Table 3.11-8**). Local jurisdictions are precluded by state law from undertaking land use activities inconsistent with their respective general plans. While transportation projects on state and interstate highways and those sponsored by special districts are not necessarily derived from local general plans, these project

sponsors work with their respective county transportation agencies to ensure consistency with local jurisdiction planning efforts. As a result, the transportation projects in the proposed plan are not expected to conflict with the land use designations of current local general plans.

Table 3.11-8: Acreage of Transportation Projects Footprint within Parks and Open Space

County	Total (acres)
Alameda	140
Contra Costa	4
Marin	1
Napa	2
San Francisco	3
San Mateo	<1
Santa Clara	60
Solano	140
Sonoma	10
Regional Total	370

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.

Sources: GreenInfo Network 2024a, 2024b; data compiled by MTC and ABAG in 2025.

Local Coastal Programs

The proposed plan's transportation projects footprint has minimal overlap with the Coastal Zone, with approximately one acre in San Mateo County. As described above, San Mateo County and San Francisco County have adopted LCPs, consistent with the Coastal Act. Development in the coastal zone is subject to a coastal development permit when there would be change in the use of land or water. The overall goal of applying for and receiving a coastal development permit is to ensure that a project is consistent with the Coastal Act, and by extension LCPs. Therefore, inconsistencies with LCPs would not occur.

BCDC

Regionally, overlap between PUAs and the transportation projects footprint is approximately 240 acres. As shown in **Table 3.11-9**, the overlap is greatest in Solano, Alameda, and Santa Clara Counties. Proposed transportation projects generally seek to improve access and mobility throughout the region and are expected to promote public access to lands within BCDC jurisdictions in general. BCDC can permit automobile and transit projects on bay fill only if the structure is a bridge. It is necessary to obtain BCDC approval before undertaking any work within 100 feet of the bay shoreline (including grading); filling of the bay or certain tributaries of the bay; dredging; Suisun Marsh projects; and any filling, new construction, major remodeling, substantial change in use, and many land subdivisions in the bay, along the shoreline, in salt ponds, and in duck hunting preserves or other managed wetlands adjacent to the bay. Although portions of the transportation projects footprint overlap with the PUAs, future transportation projects would be required to demonstrate consistency with the Bay Plan as part of the development review process for individual projects. Therefore, implementation of the transportation projects footprint would not conflict with the Bay Plan.

Table 3.11-9: Acreage of Transportation Projects Footprint within BCDC's Priority Use Areas

County	Total (acres)
Alameda	70
Contra Costa	<1
Marin	0
Napa	0
San Francisco	20
San Mateo	10
Santa Clara	60
Solano	80
Sonoma	3
Regional Total	240

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum because of independent rounding.
Source: BCDC 2020; data compiled by MTC and ABAG in 2025.

Delta Plan

Portions of Alameda, Contra Costa, and Solano Counties overlap with areas covered by the Delta Plan, adopted by the Delta Stewardship Council. The boundaries, which are described in Delta Plan Policy DP Pl, Locate New Urban Development Wisely (23 CCR Section 5010), are intended to strengthen existing Delta communities while protecting farmland and open space, providing land for ecosystem restoration needs, and reducing flood risk. Delta Plan Policy DP P1 is consistent with the Delta Reform Act (PRC Section 29702), which states that one of the basic goals of the State for the Delta is to "[p]rotect, maintain, and, where possible, enhance and restore the overall quality of the Delta environment, including, but not limited to, agriculture, wildlife habitat, and recreational activities." Development of transportation projects could affect consistency with the Delta Plan if the projects could expand urban development into the Delta. However, subsequent transportation projects within the proposed plan that fall within the Delta Plan boundaries would be required to demonstrate consistency with the plan and satisfy mitigation requirements.

Conclusion

Implementation of the proposed plan could result in land use development, sea level rise adaptation projects, and transportation projects in areas that are not consistent with existing long-range plans, including local general plans, the Bay Plan, LCPs, and the Delta Plan. However, because the forecasted development pattern, sea level rise adaptation projects, and transportation projects that fall within the boundaries of the Bay Plan, LCPs, and the Delta Plan must demonstrate consistency with these plans and satisfy mitigation requirements as needed, the plan would not conflict with the environmental protection requirements imposed by these plans. Where implementation of the plan would be inconsistent with locally adopted plans and policies, conflicts would be resolved through voluntary updates to local plans to allow development that is consistent with both the plan and local adopted plans. Furthermore, the plan's strategies generally seek to minimize environmental effects by encouraging growth in areas that are already largely developed. Therefore, implementation of the proposed plan would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental impact. The impacts would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact LU-3: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) (LTS)

Land Use Impacts

As discussed in Chapter 2, "Project Description," the forecasted housing and employment growth includes the projected population distribution that would occur in 2050 if the plan's strategies are implemented. The regional growth forecast projects the region's employment to grow by 1.4 million to just over 5.3 million total jobs between 2020 and 2050. Population is forecasted to grow by 1.8 million people, to a population of 9.6 million. This population would comprise over 3.8 million households, for an increase of roughly 1 million households from 2020. The draft regional growth forecast was first released for public review in late 2023 and in January 2025. The final regional growth forecast was included in the Final Blueprint. MTC and ABAG approved the Final Blueprint Strategies, including the Final Transportation Project List and Final Resilience Project List, and Final Blueprint Growth Geographies (see Section 2.3, "Planning Assumptions").

The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that would result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. The proposed plan does not induce growth; rather, it identifies integrated land use and transportation strategies to accommodate forecasted regional growth for all economic segments of the population while achieving State greenhouse gas (GHG) emissions reduction targets. In doing so it responds to state requirements and complies with the settlement agreement with the BIA, see Section 1.7.4, "Settlement Agreement," by ensuring housing for all income levels and including sufficient housing to avoid an increase in in-commuters to the region.

Government Code Section 65080(b)(2)(B)(ii) requires that an RTP/SCS must accommodate all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan. In accordance with requirements, the proposed plan's housing strategies detail how the region's forecasted 1.5 million new housing units could be accommodated over the next 25 years. The housing strategies continue the region's commitment to "focused growth" but are also intended to protect current residents from displacement, preserve existing affordable housing, and produce new housing to secure long-term affordability in order to address the Bay Area's housing crisis, especially housing at the lower income categories.

The proposed plan's Growth Geographies build on local and regional planning efforts and include locally nominated PDAs and PPAs within the nine-county Bay Area. HRAs—communities with well-resourced schools and easy access to jobs, parks, and other amenities—identified by the State of California were also included as a new housing Growth Geography to counterbalance housing policies that have historically led to limited housing development, particularly housing affordable to low-income households. Areas close to rail, ferry, or frequent bus service (TRAs) were also included as Growth Geographies to support climate emissions goals, with more housing near transit allowing more people to have access to sustainable transportation options.

Implementation of the proposed plan's land use growth footprint would accommodate approximately 54% of the region's future growth within PDAs, 22% in PPAs, 3% in HRAs, 10% in TRAs, and 10% in HRA-TRAs. Proposed plan strategies would move the region towards more compact, mixed-use development with a variety of housing types leading to more opportunities for walking and biking, more transit use, and shorter automobile trips. Additionally, proposed plan Strategy EN4, "Maintain Urban Growth Boundaries," confines new development within areas of existing development or areas otherwise suitable for growth

within urban growth boundaries, as established by local jurisdictions. This would limit the potential for inducement of unplanned growth within the region.

In some cases, implementation of the proposed plan's strategies—such as Strategy H3, "Allow a Greater Mix of Housing Densities and Types in Growth Geographies" and Strategy H6, "Transform Aging Malls and Office Parks into Neighborhoods"—would result in greater density/intensity of growth than included in current adopted local general plans. However, the proposed plan does not change local land use policies and would not induce unplanned growth within individual jurisdictions; each jurisdiction would retain local land use authority and would need to plan for and approve previously unplanned growth. As such, implementation of the proposed plan would require each local jurisdiction to consider and resolve those differences through appropriate amendments to local planning documents and appropriate environmental review, thus avoiding impacts related to unplanned growth at the local level. The impacts of implementing the proposed plan's land use strategies are analyzed throughout this EIR.

Overall, the plan accommodates forecasted growth through implementation of the plan's land use strategies to intensify density in developed areas, rather than induces unplanned growth. Impacts would be less than significant (LTS).

Sea Level Rise Adaptation Impacts

The proposed plan's sea level rise adaptation projects would protect existing developed areas and support the proposed plan's focused growth approach by adapting shorelines and reducing sea level rise inundation hazards. Strategy EN1, "Adapt to Sea Level Rise," protects shoreline communities affected by sea level rise by identifying a series of adaptation projects. The protection of existing communities would limit the potential for inducement of unplanned growth within the region. Impacts would be less than significant (LTS).

Transportation System Impacts

The proposed plan's transportation strategies detail how the region's $512 billion in forecasted transportation revenues (out of the approximately $1.5 trillion total Final Blueprint investment) would be invested over the next 25 years. The proposed plan strategies would move the region towards more compact, mixed-use development with a variety of housing types leading to more opportunities for walking and biking, transit use, and shorter automobile trips. Transportation strategies included in the proposed plan would support increased density in existing urban areas by facilitating travel. These projects are not expected to induce population growth, as they are intended to enhance existing transportation networks and support planned growth.

The proposed plan would result in increased transit productivity, an increased bicycling and walking mode share, a decreased automobile mode share, and decreased VMT per capita. This substantiates the conclusion that the strategic roadway expansions in the proposed plan, in combination with other modal investments, support more compact development and more sustainable and more efficient development without inducing the type of population growth that would require development of more land for urban purposes. As a result, the transportation projects in the proposed plan are not expected to induce substantial unplanned population growth but to accommodate the housing, employment, and population forecasts for the region. Impacts would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects would move the region toward more compact, mixed-use development with a variety of housing types. As discussed, the proposed plan does not induce growth but accommodates growth forecasted to occur in the region. Additionally, proposed plan strategies confine new development within areas of existing development or areas otherwise suitable for growth within urban

growth boundaries, as established by local jurisdictions. This would limit the potential for inducement of unplanned growth within the region. Sea level rise adaptation projects would protect existing development and locally planned growth. Transportation strategies likewise are designed to support existing uses and accommodate forecasted development rather than induce unplanned growth. Impacts would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact LU-4: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere (PS)

Land Use Impacts

The discussion in this section addresses both regional and localized displacement, including displacement of lower-income residents. The proposed plan's housing strategies support accommodation of the region's forecasted 1.5 million new housing units between 2020 and 2050. The housing strategies continue the region's commitment to "focused growth" but are also intended to protect current residents from displacement, preserve existing affordable housing, and produce new housing to secure long-term affordability in order to address the Bay Area's housing crisis. The proposed plan includes Strategy H2 to Protect and preserve existing affordable housing by acquiring homes currently affordable to low- and middle-income residents for preservation as permanently deed-restricted affordable housing. Additionally, the proposed plan takes on the region's decades-long housing affordability challenges and resulting displacement—affecting both renters and owners In the Bay Area—including legal protections and prohibition of exploitative landlord behaviors. Strategy H1 strengthens renter protections by expanding measures to increase housing security for renters, including tenant support services, enforcement of tenant legal protections, and limits on rent increases that exempt new construction. These strategies are detailed in Chapter 2, "Project Description."

Displacement risk is a function of the location and availability of affordable housing near major job centers in a growing regional economy. As the growth in jobs (particularly those that pay higher wages) outpaces the supply of housing (particularly those that are affordable to lower-income households), the cost of housing inevitably rises faster than wages for all workers. In such market conditions, higher-income workers are better positioned to compete for the limited supply of housing opportunities, resulting in a higher risk of displacement for all other residents. To the extent that the private or the public sectors can provide more market rate and deed-restricted affordable housing in these communities, this risk subsides.

Displacement risk for lower-income residents may increase because of other reasons as well. These include:

- physical constraints such as a lack of available land for new housing in communities that have a significant number of jobs, with the resulting potential for redevelopment of existing residential areas with new employment or residential development;
- policy constraints such as regulations that hinder environmentally-sound development of infill sites or other sites that could support higher-density housing, and inadequate public spending on housing and transportation infrastructure;
- social constraints such as local community opposition to higher-density rental housing; and
- economic conditions, such as high land and labor costs, loss of household income as a result of a shrinking market for middle-wage jobs, and competition for available land from other uses.

Between 1970 and 2021, the Bay Area's median income increased by 25%, but this period also saw low incomes shrink while the highest incomes continued to grow. With fewer people earning a middle-class income, many Bay Area residents opted to leave their neighborhoods or the regional altogether. Pandemic-related population shifts starting in 2020 exacerbated displacement of residents with low incomes and people of color from the region's major cities into more affordable suburban or out-of-region communities. This trend is expected to continue with or without the adoption of the proposed plan. However, the proposed plan includes housing strategies for affordable housing protection, preservation and production so that households of all backgrounds can afford to live, work and raise their families in the Bay Area.

Adoption of the proposed plan does not authorize or provide entitlement to redevelopment or construction projects in the region. Rather, the proposed plan is a collection of integrated strategies that set a vision for future development, which must still be reviewed, analyzed, and approved by local governments, which retain full control over local land use authority. This is described in more detail in Chapter 2, "Project Description."

Despite these limitations, the proposed plan addresses displacement risk by increasing resources for affordable housing and non-automobile transportation access in lower-income neighborhoods, and by supporting economic opportunities across the region that benefit existing residents. Additional strategies to address housing affordability and displacement risk are described in the proposed plan. The Draft Implementation Plan includes several recommendations:

- **All housing strategies:** Expand regional funding and seek near-term grant and philanthropic funding to deliver affordable housing and maintain existing regional housing products.
- **Protect and preserve affordable housing:** Collaborate with local partners and advocate for State legislation to protect and reserve affordable housing.
- **Spur housing production for people of all income levels**: Support the reuse of underutilized properties to meet regional and local housing needs. promote inclusive communities to increase housing opportunities and improve feasibility of affordable housing through local development streamlining and funding alignment.
- **Create inclusive communities.** Expand and improve technical assistance for plan-aligned housing projects on public land and expand project-specific support to agencies that are pursuing reuse projects on public land that deliver benefits to existing communities alongside new affordable housing.

CEQA requires analysis and mitigation of potentially substantial adverse changes in the physical environment (PRC Sections 21151, 21060.5, and 21068). "Economic and social changes resulting from a project are not treated as significant environmental effects [citation] and, thus, need not be mitigated or avoided under CEQA" (*San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 209 Cal.App.3d 1502, 1516). Physical changes in the environment caused by economic or social effects of a project may constitute significant environmental effects (CEQA Guidelines Sections 15131 and 15064[e]). Social and economic effects in and of themselves, however, are not significant effects on the environment under CEQA (*Melom v. City of Madera* [2010] 183 Cal.App.4th 41, 55). The following addresses the potential for physical impacts associated with displacement risk at the regional and local levels.

Regional Displacement Impacts

Regional displacement is addressed under SB 375, which requires that the SCS identify sufficient areas in the region to house all segments of the projected population. The proposed plan's housing targets are based on the regional growth forecast, which estimates how much the Bay Area might grow through 2050, including population, jobs, households and associated housing units. During the Blueprint planning phase, the regional growth forecast was used to identify the total amount of growth for the region. The

draft regional growth forecast was first released for public review in late 2023 and again in January 2025. The final regional growth forecast was included in the Final Blueprint. MTC and ABAG approved the Final Blueprint Strategies, including the Final Transportation Project List and Final Resilience Project List, and Final Blueprint Growth Geographies (see Section 2.3, "Planning Assumptions").

The regional growth forecast projects the region's employment to grow by 1.4 million to approximately 5.4 million total jobs between 2020 and 2050. Population is forecasted to grow by 1.8 million people, reaching approximately 9.6 million. Households are projected to increase by roughly 1 million, to about 3.8 million. The number of housing units reflects state requirements to ensure housing for all income levels and is also designed to prevent net growth in the in-commute into the region, consistent with state law and MTC and ABAG's legal settlements with the Building Industry Association. This housing unit projection includes housing for all projected households—across all income levels—plus the number of units that would be needed to house the increased number of workers estimated to commute into the region.

Incorporating the regional growth forecast into the proposed plan ensures sufficient capacity such that all segments of the workforce added under the plan are housed within the Bay Area with no net increase in in-commuting from other counties outside the region. Therefore, the forecasted development pattern would be consistent with population and employment growth projections in the Bay Area. Through the use of modeling, described in detail in Chapter 2, "Project Description," the land use growth footprint assumes an adequate number of residential units to meet the forecasted demand, taking into account localized displacement of some households within the region while reducing the potential for regional displacement. Thus, implementation of the proposed plan would not result in displacement at the regional scale and impacts at the regional level would be less than significant (LTS). Displacement outside of the region is discussed in the cumulative analysis provided in Chapter 5, "Other CEQA-Mandated Sections."

Local Displacement Impacts

At the local level, displacement can result in physical effects both directly and indirectly. The potential for direct effects would result from projected growth occurring at the site of existing residential units. Local displacement could include households who are relocating to the proposed Growth Geographies where new housing would be developed under the proposed plan. However, the proposed plan accounts for future replacement housing, because it includes strategies to provide sufficient housing to accommodate population and job growth and to provide sufficient housing for all income levels. Thus, any local displacement would be temporary, as additional subsidized affordable housing would be provided pursuant to the plan.

Redevelopment of housing sites within the Growth Geographies could result in displacement of current residents and may necessitate construction of replacement housing, resulting in direct impacts. Projected redevelopment and new housing are included in the forecasted development pattern of the proposed plan, and as a result the associated physical environmental impacts from this development are analyzed throughout this EIR. The full impacts from the projected redevelopment and new housing construction would depend on site-specific conditions and project design details that cannot be known at this time. This EIR analyzes potential impacts that may result from this change in the following areas: aesthetics and visual resources, agriculture and forestry resources, air quality, biological resources, climate change, greenhouse gases, and energy, cultural resources and tribal cultural resources, geology, seismicity, and mineral resources, hazards and wildfire, hydrology and water quality, land use, population, and housing, noise, public services and recreation, public utilities and facilities, and transportation.

Therefore, any local displacement would be temporary because the proposed plan includes strategies to replace any lost housing with new housing at all income levels so that households of all backgrounds can afford to live, work, and raise their families in the Bay Area. The impacts of this growth are addressed

throughout this EIR and in some cases have been identified as potentially significant. For this reason, this impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

The proposed plan's sea level rise adaptation projects would require the expansion of existing, or addition of new levees, seawalls, elevated roadways, marsh restoration, and tidal gates for regularly inundated shoreline areas. Not all of the proposed plan's sea level rise adaptation projects would be expected to require earthmoving activities and/or have a footprint associated with implementation. For example, marsh land restoration was not included in the adaptation footprint, whereas elevated highway/roadways, levees, sea walls and tidal gates have been included in the footprint. The overall footprint associated with adaptation projects is approximately 84,100 acres. Actual displacement of homes by sea level rise adaptation projects would depend on site-specific conditions and project design details that cannot be known at this time. However, it is expected that the number homes to be affected by sea level rise without adaptation projects would be greater than the number of homes to be affected by sea level rise adaptation projects. This EIR analyzes the potential impacts that may result from replacement of these housing units in the following areas: aesthetics and visual resources, agriculture and forestry resources, air quality, biological resources, climate change, greenhouse gases, and energy, cultural resources and tribal cultural resources, geology, seismicity, and mineral resources, hazards and wildfire, hydrology and water quality, land use, population, and housing, noise, public services and recreation, public utilities and facilities, and transportation. This impact would be potentially significant (PS).

Transportation System Impacts

Transportation projects that require the expansion of existing, or designation of new, rights-of-way have the potential to result in the direct displacement of existing housing that must be removed for infrastructure development. Generally, to minimize environmental impacts and project costs, it is common practice to design the footprint of new transportation projects within existing rights-of-way as much as feasible. This practice is assumed as a part of this analysis. However, development of roadway widening, roadway extension, and transit expansion projects, could result in the disturbance and/or loss of residential uses. The degree of the disruption would generally depend on the size and extent of the project and the resulting need for new right-of-way. For the purposes of this analysis, proposed transportation projects were assumed to affect approximately 8,600 acres across the Bay Area. This is described in more detail in Section 3.1, "Approach to the Analysis." This is a conservative assumption intended to avoid a risk of understating the impact. Actual displacement of homes by transportation projects would depend on site-specific conditions and project design details that cannot be known at this time. The replacement of these housing units would result in environmental impacts, which are described throughout this EIR for the following potential impact areas: aesthetics and visual resources, agriculture and forestry resources, air quality, biological resources, climate change, greenhouse gases, and energy, cultural resources and tribal cultural resources, geology, seismicity, and mineral resources, hazards and wildfire, hydrology and water quality, land use, population, and housing, noise, public services and recreation, public utilities and facilities, and transportation. This impact would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects may result in displacement of existing residential units, necessitating the construction of replacement housing elsewhere. Significant environmental impacts associated with the replacement housing are addressed throughout this EIR. This is a **potentially significant (PS)** impact. Mitigation Measure LU-4 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure LU-4 Implementing agencies and/or project sponsors shall implement, where feasible and as applicable based on project- and site-specific considerations, the mitigation measures described throughout this EIR to address the effects of displacement that could result in the construction of replacement housing, including:

- Mitigation Measures AES-1 through AES-4
- Mitigation Measures AGF-1 through AGF-3
- Mitigation Measures AQ-2 through AQ-4
- Mitigation Measures BIO-1 through BIO-3 and BIO-5
- Mitigation Measures GHG-1 and GHG-3
- Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4
- Mitigation Measure GEO-7
- Mitigation Measures HAZ-4, HAZ-6 and HAZ-7
- Mitigation Measure LU-1
- Mitigation Measures NOISE-1 through NOISE-4
- Mitigation Measures PSR-1 and PSR-2
- Mitigation Measures PUF-1 through PUF-4
- Mitigation Measure TRA-2

Significance after Mitigation

Implementation of this mitigation measure would reduce the magnitude of potentially significant impacts, as explained in the impact discussions related to each impact and mitigation measure. However, as noted under Impacts AES-1, AES-2, AES-3, AGF-1, AGF-2, AGF-3, AQ-3, AQ-4, GHG-1, GHG-3, CUL/TCR-1, CUL/TCR-2, CUL/TCR-4, HAZ-7, LU-1, NOISE-1, NOISE-2, NOISE-3, NOISE-4, PSR-1, PSR-2, PUF-1, PUF-2, PUF-4, and TRA-2, there would still be instances where the impact remains significant following implementation of mitigation measures. Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. This impact would remain **significant and unavoidable (SU)**.

3.12 NOISE

This section assesses the potential noise and vibration impacts associated with implementation of the proposed plan. The following discussion includes acoustical terminology and background information relevant to the proposed plan, a presentation of applicable regulatory standards, assessment of acoustical impacts related to implementation of the proposed plan, and identification of potentially applicable noise mitigation measures where appropriate.

Comments received in response to the Notice of Preparation included requests that the EIR evaluate the effects of noise and vibration on biological resources and the consistency of the proposed plan with the San Francisco Bay Conservation and Development Commission Regional Shoreline Adaptation Plan (RSAP) and the RSAP Subregional Shoreline Adaptation Plan guidelines. The RSAP and RSAP guidelines do not include specific standards related to noise and vibration, and thus, are not discussed further in this section. The effects of noise and vibration in the plan area between now and 2050 as they relate to biological resources are addressed in Section 3.5, "Biological Resources."

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of impacts in this section. Appendix B includes all Notice of Preparation comments received.

3.12.3 Environmental Setting

COMMON TERMINOLOGY

Noise Descriptors

Noise in daily environments fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The following noise descriptors are used in environmental noise and vibration analysis:

- **Equivalent sound level (L_{eq}):** The Federal Highway Administration (FHWA) Noise Abatement Criteria represents an average of the sound energy occurring over a specified time period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that occurs during the same period. The 1-hour, A-weighted equivalent sound level (L_{eq}[h]) is the energy average of A-weighted sound levels occurring during a 1-hour period, and it is the basis for noise abatement criteria (NAC) used by the California Department of Transportation (Caltrans) and the FHWA.
- **Percentile-exceeded sound level (L_n):** The L_n represents the sound level exceeded "n" percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum sound level (L_{max}):** The L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-night average level (L_{dn}):** The L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during nighttime hours (10:00 p.m.–7:00 a.m.). The L_{dn} is often noted as the DNL.

- **Community noise equivalent level (CNEL):** In addition to the penalty detailed above, CNEL applies a 5-dB penalty to the A-weighted sound levels during evening hours (7:00 p.m.–10:00 p.m.). The CNEL is usually within 1 dB of the L_{dn}, and the two are interchangeable for all intents and purposes.
- **Single-event noise level (SEL):** SEL is a receiver's cumulative noise exposure from a single impulsive-noise event, which is defined as an acoustical event of short duration that involves a change in sound pressure above some reference value. It is typically used to evaluate noise exposure from aircraft flight events.
- **Vibration decibels (VdB):** VdB is the vibration velocity in the decibel scale (FTA 2018).
- **Peak particle velocity (PPV):** PPV is the peak signal value of an oscillating vibration waveform, usually expressed in inches per second (in/sec) (FTA 2018).

ACOUSTIC FUNDAMENTALS

Acoustical Terminology

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (e.g., loud, unexpected, or annoying sound). "Acoustics" is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise the receiver perceives. Acoustics addresses primarily the propagation and control of sound.

Frequency

The number of sound pressure peaks traveling past a given point in a single second is the frequency, expressed in cycles per second, or hertz (Hz). A given sound may consist of energy at a single frequency (pure tone) or in many frequencies over a broad frequency range (or band). Human hearing is generally affected by sound frequencies between 20 Hz and 20,000 Hz (20 kilohertz).

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the perceived loudness of that source. Sound pressure amplitude is measured in micro-Pascals (µPa). One µPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different noise environments can range from fewer than 100 µPa to 100,000,000 µPa. Because of this large range of values, sound is rarely expressed in terms of pressure. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

Addition of Decibels

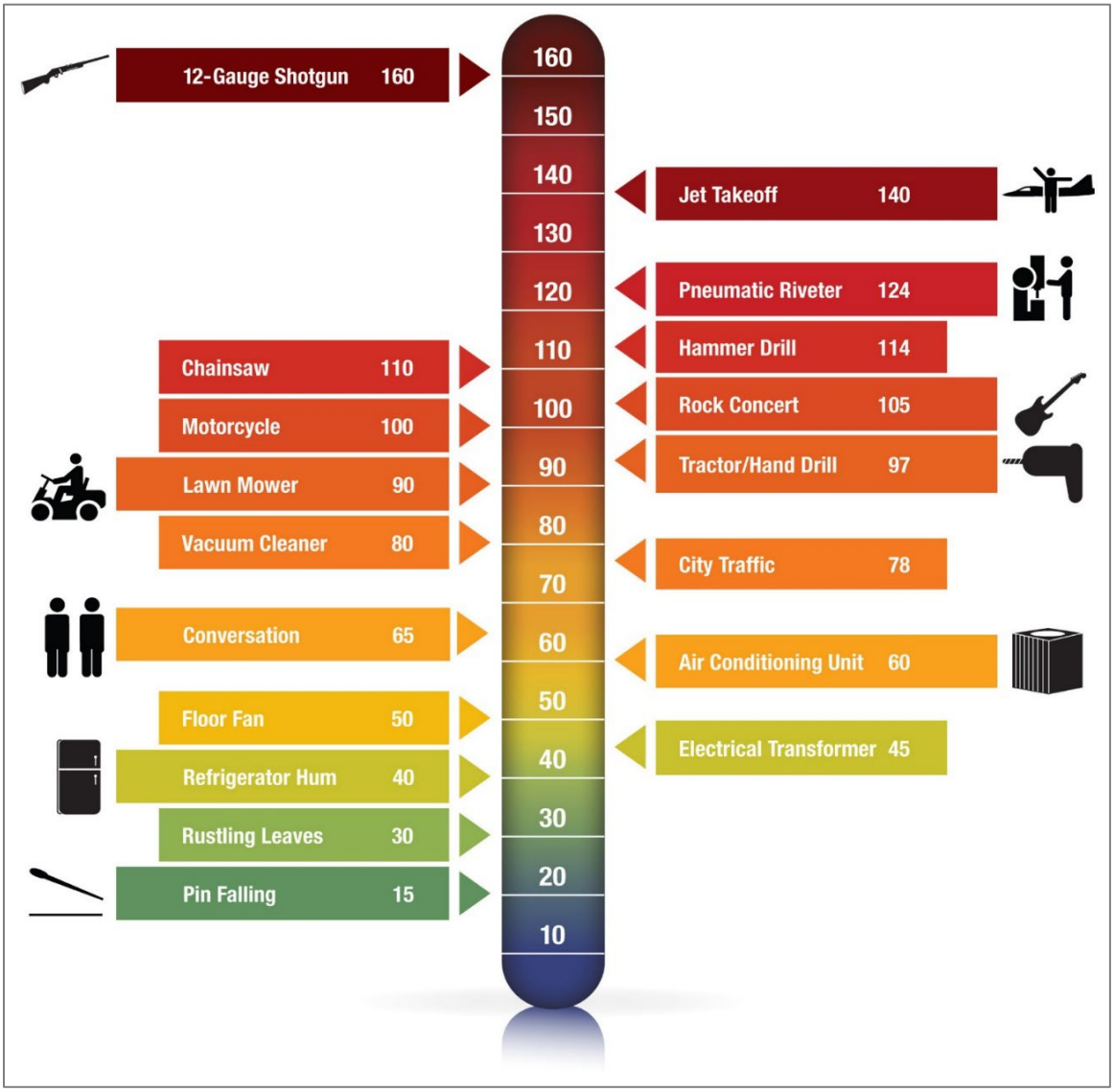
Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two sources simultaneously produce sounds of the same loudness, the resulting sound level at a given distance would be approximately 3 dB higher than one of the sources under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level of approximately 5 dB louder than one source, and 10 sources of equal loudness together produce a sound level of approximately 10 dB louder than the single source.

A-Weighted Decibels

Figure 3.12-1 illustrates sound levels associated with common sound sources. The perceived loudness of sounds is dependent on many factors, including SPL and frequency content. However, within the usual range of environmental sound levels, perception of loudness is relatively predictable and can be approximated by

frequency filtering using the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard descriptor for environmental noise assessment. All noise levels reported in this section are presented in terms of A-weighting unless otherwise noted.

Figure 3.12-1: Decibel Scale and Common Noise Sources



Sources: National Institute for Occupational Safety and Health 2020; 3M 2016.

Human Response to Changes in Noise Levels

As discussed above, the doubling sound energy results in a 3 dB increase in the sound level. However, an exact doubling of the sound level as measured by precise instrumentation will usually differ from the subjective human perception of a doubling of loudness.

Under controlled conditions in a laboratory setting, the trained, healthy human ear can discern 1 dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency range (1,000–8,000 Hz). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible; however, it is widely accepted that people can begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness;

therefore, a doubling of sound energy that would result in a 3 dB increase in SPL would generally be perceived as barely detectable. Please refer to **Table 3.12-1**.

Table 3.12-1: Approximate Relationship between Increases in Environmental Noise Level and Human Perception

Noise Level Increase, dB	Human Perception (Typical)
Up to about 3	Not perceptible
About 3	Barely perceptible
About 6	Distinctly noticeable
About 10	Twice as loud
About 20	Four times as loud

Note: dB = decibels.
Source: Egan 2007.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect land use. Noise-sensitive land uses typically include residences, hospitals, schools, transient lodging, libraries, and certain types of recreational uses. Noise-sensitive residential receivers are found throughout the plan area.

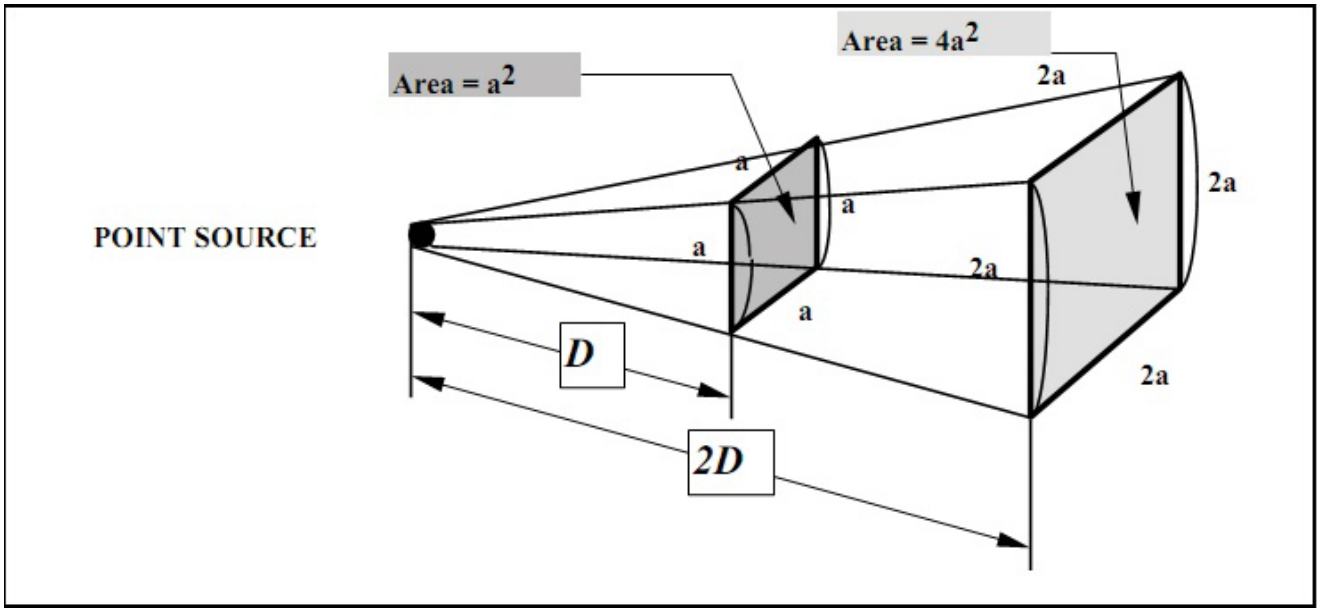
Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

Geometric Spreading

Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is called *spherical spreading*. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point/stationary source as its energy is continuously spread out over a spherical surface (see **Figure 3.12-2**).

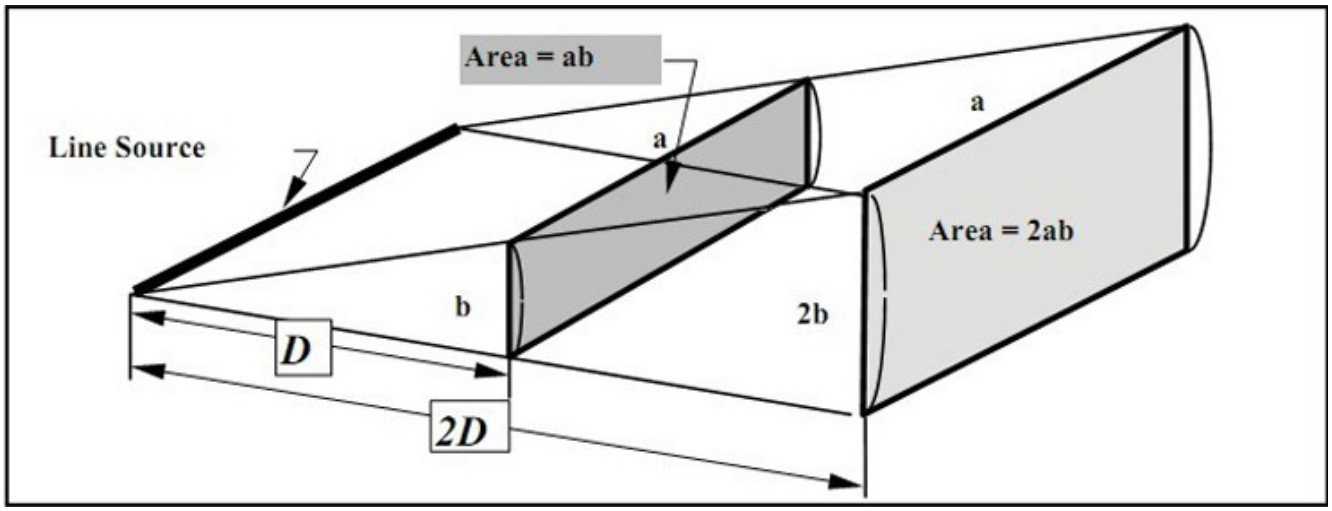
Figure 3.12-2: Point Source Spreading with Distance



Source: Caltrans 2013.

Roadways and highways, and to some extent, moving trains, consist of several localized noise sources on a defined path and hence are treated as "line" sources, which approximate the effect of several point sources (see **Figure 3.12-3**). Noise from a line source propagates over a cylindrical surface, often referred to as *cylindrical spreading*. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. Therefore, noise attributable to a line source attenuates less with distance than a point source with increased distance.

Figure 3.12-3: Line Source Spreading with Distance



Source: Caltrans 2013.

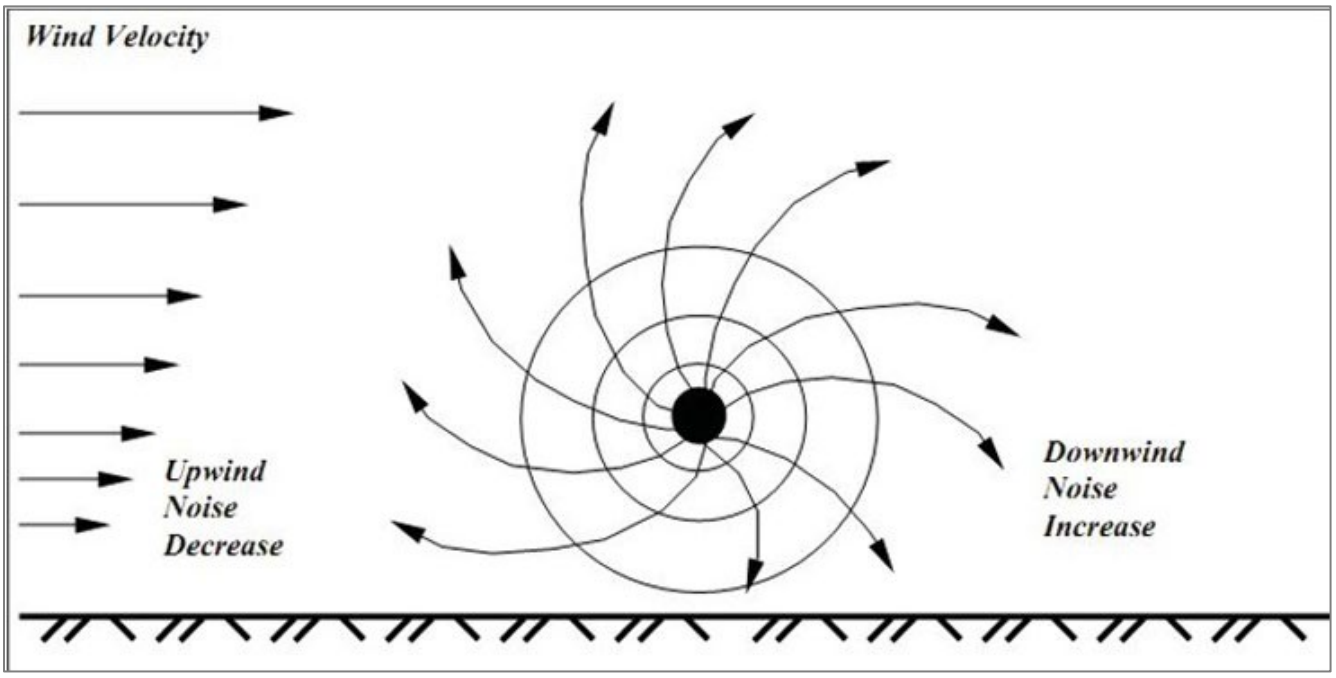
Ground Absorption

The noise propagation path from many typical sources, such as roadways, to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, excess attenuation has also been expressed in terms of attenuation per doubling of distance. No excess ground attenuation is generally assumed for acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a paved parking lot or body of water). For acoustically absorptive or soft sites (i.e., sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is typically assumed. When added to the attenuation rate associated with cylindrical spreading from traffic noise sources, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance. Adding to spherical spreading (point sources) results in an overall drop-off rate of approximately 7.5 dB. These approximations are generally applicable only for receivers within 300 feet of the noise source(s) and should not be applied to sound path lengths of more than 300 feet.

Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas receivers upwind from the source can have lowered noise levels. This is illustrated in **Figure 3.12-4**.

Figure 3.12-4: Wind Effects on Noise Levels



Source: Caltrans 2013.

In addition to the enhancing effect produced by wind, sound levels can increase at large distances from the source (e.g., more than 500 feet) because of atmospheric temperature inversions (i.e., increasing temperature with elevation) or can decrease with distance from the source at a higher rate than the typical spreading loss with distance rate (see above) because of a temperature lapse condition (i.e., decreasing temperature with elevation).

Other factors, such as air temperature, humidity, and turbulence, can also affect sound propagation. For instance, air temperature and humidity affect the rate of molecular absorption as sound travels large distances. A sound consisting primarily of middle frequencies, such as speech or animal vocalization, attenuates approximately five additional decibels for every 1,000 feet of travel with an air temperature of 70 degrees Fahrenheit and a humidity of 30–40%. This atmospheric effect is in addition to the other effects discussed above.

Vibration

Vibration is energy transmitted in waves through the ground. These energy waves dissipate with distance from the vibration source. Because energy is lost during the transfer of energy from one particle to another, the vibratory energy is reduced with increasing distance from the source. Vibration attenuates at a rate of approximately 50% for each doubling of distance from the source. This approach only takes into consideration the attenuation from geometric spreading. Because additional factors reduce vibration over distance (e.g., damping from soil condition), this approach tends to provide for a conservative assessment of vibration level at the receiver.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Vibration is typically described by its peak amplitude and root-mean-square (RMS) amplitude. The RMS value can be considered an average value over time. The peak vibration velocity is the same as the "peak particle velocity" (PPV), generally presented in units of inches/second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal, and PPV is generally used to assess the potential for damage to buildings and structures. The RMS amplitude is typically used to evaluate

human annoyance to vibration. The RMS velocity is often expressed in decibel notation as VdB, which serves to compress the range of numbers required to describe vibration (FTA 2018: 7-4; Caltrans 2020:7).

PHYSICAL SETTING

The existing noise environment in the Bay Area comprises two primary categories of noise sources: transportation and non-transportation. Transportation sources include surface vehicle traffic; railroad train operations, including light rail and commuter trains; and aircraft operations. Non-transportation, or stationary/fixed, sources include commercial/industrial equipment, construction equipment, and any other sources not associated with transporting people or goods. Existing noise exposure in the Bay Area associated with these primary noise sources is presented below.

Traffic Noise Sources

The ambient noise environment in urban areas is primarily influenced by traffic noise. Traffic noise exposure is primarily a function of the volume of vehicles per day, the speed of those vehicles, the type of ground (i.e., hard or soft), the number of those vehicles represented by medium and heavy trucks, the distribution of those vehicles during daytime and nighttime hours, and the proximity of noise-sensitive receivers to the roadway. Baseline traffic noise (based on the traffic study) in the plan area has been characterized using traffic noise modeling. The baseline for the noise analysis is a simulation of 2023 traffic levels and land use consistent with the plan's base year for transportation. According to modeling conducted for all roadway types within the plan area, average noise levels range from approximately 54 dBA CNEL (near collectors and small roads) to as high as approximately 77 dBA CNEL (near freeways). Refer to Impact NOISE-2 and **Table 3.12-7** for more details regarding traffic noise modeling. The traffic noise assessment in this analysis is inclusive of bus transit because buses are an assumed percentage of overall roadway volumes used in the calculation of roadside noise levels.

Rail Noise Sources

The Bay Area is also affected by noise from freight and passenger rail operations. Although these operations generate significant noise levels in the immediate vicinity of the railways, train operations are intermittent and area railways are widely dispersed. Commuter rail, such as San Francisco Municipal Railway and Valley Transportation Authority, operate with more frequency than standard gauge rail operations but at lower speeds, resulting in lower noise levels. Bay Area Rapid Transit (BART) operations, on the other hand, can attain higher speeds and have the potential for greater noise levels along extended stretches. Based on available data, noise levels from rail operations in the plan area can range from 62 dBA CNEL to 81 dBA CNEL (California High-Speed Rail Authority 2020). Train operations may also be a source of ground vibration near the tracks. Vibration levels depend on several factors, including track and train type, ground type, and the speed and weight of the passing train.

Aircraft Noise Sources

The Bay Area has many airports, including public-use, private-use, and military facilities. Major airports include San Francisco International, Oakland International, and Norman Y. Mineta San Jose International. In addition to the daily aircraft operations originating and terminating at these facilities, aircraft not using these airports frequently fly over the Bay Area. All of these operations contribute to the overall ambient noise environment. In general, like rail noise, the proximity of the receiver to the airport and aircraft flight path determines the noise exposure. Other contributing factors include the type of aircraft operated, altitude of the aircraft, and atmospheric conditions. Atmospheric conditions may contribute to the direction of aircraft operations (flow) and affect aircraft noise propagation.

As discussed in further detail below, State law requires land use commissions to prepare and adopt an airport land use compatibility plan (ALUCP) for each public-use and military airport. These plans typically

include airport noise contour maps, which are modeled based on airport-specific activity data. Airport noise contours are specific to each airport. However, for informational purposes, noise contours from three of the largest airports in the plan area (San Francisco International Airport, Oakland International Airport, and Mineta San Jose International Airport) are briefly identified below.

According to the ALUCP for San Francisco International Airport, the 65 dBA CNEL contour extends approximately 6 miles northwest of the airport (C/CAG 2012). According to the ALUCP for Oakland International Airport, the 65 dBA CNEL contour extends approximately 5 miles south of the airport (Alameda County 2010). According to the ALUCP for San Jose Mineta International Airport, the 65 dBA CNEL contour extends approximately 2.5 miles northwest and 3 miles southeast of the airport (Santa Clara County 2024). Many other smaller airports and airstrips in the plan area with widely varying noise levels contribute to the existing ambient noise levels.

Construction Noise Sources

New development and implementation of transportation projects would necessarily include construction activities that create relatively short-term noise exposure. Noise production from construction equipment varies greatly depending on factors such as the operation being performed and the equipment type, model, age, and condition. Noise associated with heavy equipment diesel engine operations often dominate the noise environment in the vicinity of construction sites. Stationary sources, such as generators, pumps, and compressors, may also produce a significant contribution; however, if present, operations from impact equipment (e.g., pile driving, pavement breaking) will generally produce the highest noise levels and may also produce significant vibration in the vicinity. Maximum noise exposure from typical construction equipment operations is approximately 75–100 dB (L_{max} at 50 feet), with noise from heavy demolition and pile-driving operations having the highest noise production. Please refer to **Table 3.12-2** for typical construction noise levels.

Table 3.12-2: Typical Noise Levels from Demolition/Construction Equipment Operations

Construction Equipment	Noise Exposure Level, dB L_{max} at 50 Feet
Air Compressor	78–81
Backhoe	78–80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82–83
Concrete Mixer (Truck)	79–85
Concrete Pump (Truck)	81–82
Concrete Vibrator	76–80
Crane	81–88
Dozer	82–85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88–89
Loader	79–85
Paver	77–89
Pile Driver (Impact)	101

Construction Equipment	Noise Exposure Level, dB L_{max} at 50 Feet
Pneumatic Tool	85
Pump	76–81
Rail Saw	90
Rock Drill	81–98
Roller	74–80
Saw	76
Scarifier	83–90
Scraper	84–89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Heavy Diesel Truck	88

Notes: L_{max} = maximum sound level; dB = decibels.
Source: FTA 2018.

INDUSTRY AND OTHER NON-TRANSPORTATION NOISE SOURCES

A wide variety of industrial and other non-transportation noise sources are located in the Bay Area. These include manufacturing plants, landfills, treatment plants (e.g., water), power generation facilities, food packaging plants, lumber mills, and aggregate mining facilities, just to name a few. Noise generated by these sources varies widely but, in many cases, may be a significant if not dominant contributor to the noise environment.

3.12.4 Regulatory Setting

FEDERAL REGULATIONS

Title 23, Part 772 of the Code of Federal Regulations

Title 23, Part 772 of the CFR is the federal regulation governing traffic noise impact. A federal or federally funded project would have a traffic noise impact if it involves the construction of a new highway or includes substantial modification of an existing highway where the project would result in a substantial operational noise increase or where the predicted operational noise level approaches or exceeds the FHWA NAC. In this case, a "substantial increase" is not defined by FHWA but is generally defined by the State or local governing agencies. The noise level is defined as "approaching" the NAC if it is within 1 dB of the applicable criterion. **Table 3.12-3** summarizes the FHWA NAC as presented in the US Department of Transportation (DOT)/FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance document.

Table 3.12-3: Summary of FHWA Noise Abatement Criteria

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

Notes: L_{eq} = equivalent sound level, dBA = A-weighted decibels.
Source: DOT 2011.

Title 14, Part 36 of the Code of Federal Regulations

Aircraft operated in the United States are subject to federal requirements for noise emission levels. The requirements are set forth in 14 CFR 36, which establishes maximum acceptable noise levels for specific aircraft types, considering model year, aircraft weight, and number of engines.

The Federal Aviation Administration (FAA) Part 150 program encourages airports to prepare noise exposure maps that show land uses that are incompatible with high noise levels (FICON 1992). The program proposes measures to reduce any incompatibility. With an FAA Part 150 program approved, airport projects, such as land acquisition and residential/school sound insulation, become eligible for federal Airport Improvement Program funding.

Federal Transit Administration Noise Impact Criteria

Transit Operations Noise

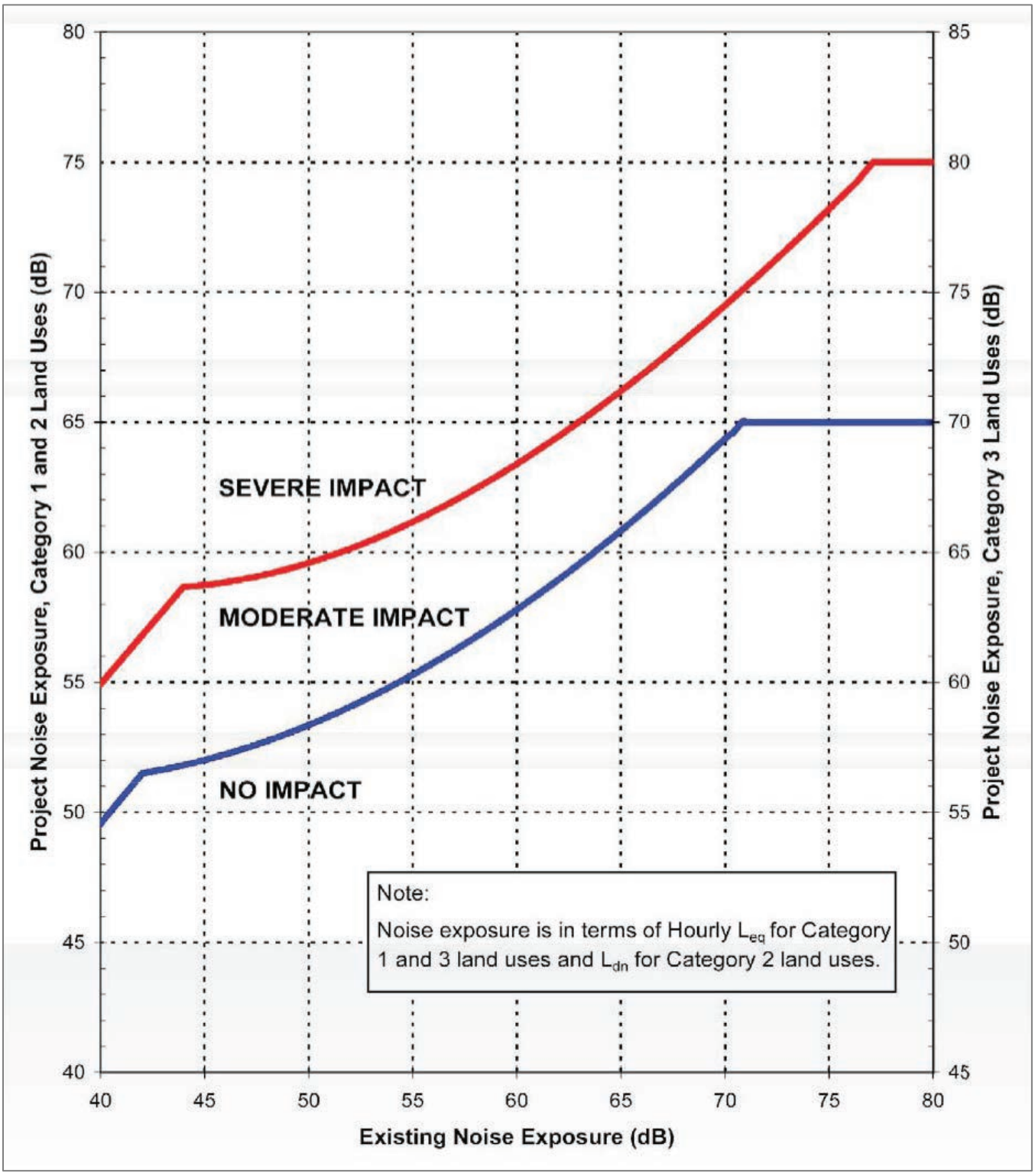
The Federal Transit Administration (FTA) offers regulations regarding noise exposure associated with federally funded transit projects. "Moderate impact" and "severe impact" criteria are established based on the existing ambient noise environment and the noise sensitivity of the receiving land use. Three categories of land use are established for the impact analysis:

- Category 1: Includes lands set aside for serenity and quiet or for outdoors performing arts entertainment (e.g., national historic landmarks, outdoor amphitheaters)
- Category 2: Residences and buildings where people normally sleep (e.g., homes, hospitals, hotels)
- Category 3: Institutional land with primary daytime or evening use (e.g., schools, libraries, churches, medical offices, theaters, parks)

Figure 3.12-5 is a graphical representation of the FTA noise impact criteria. Please note that Categories 1 and 3 apply the L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity. Category 2 applies the L_{dn} because these receivers may be affected by nighttime (10:00 p.m.–7:00 a.m.) transit-related events.

Subjectively, a "moderate impact" is generally noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. A "severe impact" would likely produce a high percentage of highly annoyed people in the community.

Figure 3.12-5: FTA Noise Impact Criteria



Source: FTA 2018.

Federal Transit Administration Vibration and Noise Impact Criteria

FTA offers regulations regarding vibration exposure associated with federally funded transit projects. Three categories of land use are established for the impact analysis:

- Category 1: Buildings where vibration would interfere with interior operations
- Category 2: Residences and buildings where people normally sleep (e.g., homes, hospitals, hotels)
- Category 3: Institutional land with primary daytime or evening use (e.g., schools, libraries, churches, medical offices, theaters, parks)

Table 3.12-4 summarizes the FTA vibration impact criteria.

Table 3.12-4: FTA Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	GVB Impact Levels (VdB re 1 microinch /sec) Frequent Events[1]	GVB Impact Levels (VdB re 1 microinch/sec) Occasional Events[2]	GVB Impact Levels (VdB re 1 microinch/sec) Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primary daytime use.	75 VdB	78 VdB	80 VdB

Notes: GVB = groundborne vibration; VdB re 1 microinch/sec = vibration decibels referenced to 1 microinch per second and based on the root-mean-square velocity amplitude.

[1] "Frequent events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.

[2] "Occasional events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

[3] "Infrequent events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Source: FTA 2018:123–126.

Construction Noise

In addition to transit operations noise, FTA offers guidance with respect to the evaluation of transit construction noise exposure. Like the operational noise criteria, construction noise criteria should consider the existing (ambient) noise environment. In addition, construction noise exposure should consider the duration of construction activities and the receiving land use (i.e., sensitivity of the receiver). The FTA construction noise guidelines are summarized in **Table 3.12-5**.

Table 3.12-5: Summary of FTA Construction Noise Criteria (Guidelines)

Affected Land Use Type	Hourly L_{eq} dBA Daytime (7 a.m.–10 p.m.)	Hourly L_{eq} dBA Nighttime (10 p.m.–7 a.m.)	8-hour L_{eq} dBA Daytime (7 a.m.–10 p.m.)	8-hour L_{eq} dBA Nighttime (10 p.m.–7 a.m.)
Residential	90	80	80	70
Commercial	100	100	85	85
Industrial	100	100	90	90

Notes: FTA = Federal Transit Administration; L_{eq} = equivalent sound level, dBA = A-weighted decibels. In urban areas with very high ambient noise levels, construction noise should not exceed ambient noise levels plus 10 dB.

Source: FTA 2018.

Construction Vibration

FTA has published guidance relative to impacts from vibration exposure. FTA has established an impact criterion of 0.5 in/sec PPV for reinforced-concrete, steel, or timber structures. Structural damage to buildings would not be expected below this value. Regularly experienced vibration levels of 80 vibration decibels (VdB; 0.01 in/sec PPV) or higher may create an annoyance response from human receivers and may be considered a nuisance.

STATE REGULATIONS

California Department of Transportation Noise and Vibration Standards

Traffic Operations Noise

The Caltrans Traffic Noise Analysis Protocol (Protocol) establishes policies and procedures to be used in the assessment of traffic noise exposure and impact for new construction and reconstruction projects. The NAC in the Protocol are the same as those presented in 23 CFR 772 (see DOT/FHWA information above). The Protocol defines a substantial project-related traffic noise level increase when the project's worst-case hour exceeds the ambient worst-case hour by 12 dB or more.

Rail Operations Noise

Caltrans endorses the use of the FTA noise criteria and methodologies for assessing project-related rail noise and vibration impacts.

Construction Noise

Caltrans Standard Specifications, Section 14-8.02, "Noise Control," establishes a construction noise exposure/production limit of 86 dB (L_{max}) at a distance of 50 feet between 9:00 p.m. and 6:00 a.m. In addition, this specification establishes that all internal combustion engines should be equipped with manufacturer-recommended mufflers and that no internal combustion engines may be operated without mufflers (Caltrans 2018).

Vibration

In 2020, Caltrans published the *Transportation and Construction Vibration Manual*, which provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage (Caltrans 2020). **Table 3.12-6** presents Caltrans-recommended levels of vibration that could result in damage to structures exposed to continuous vibration.

Table 3.12-6: Caltrans-Recommended Vibration Levels

PPV (in/sec)	Effect on Buildings
0.4–0.6	Architectural damage and possible minor structural damage
0.2	Risk of architectural damage to normal dwelling houses
0.1	Virtually no risk of architectural damage to normal buildings
0.08	Recommended upper limit of vibration to which ruins and ancient monuments should be subjected
0.006–0.019	Vibration unlikely to cause damage of any type

Notes: PPV = peak particle velocity; in/sec=inches per second.
Source: Caltrans 2020.

California Code of Regulations

Aircraft Operations

The California Airport Noise Standards, Title 21, Section 5000 et seq. of the CCR apply to any airport that is deemed to have a "noise problem" as established by the local county board of supervisors in accordance with the provisions in the regulation. Currently, in the Bay Area, Norman Y. Mineta San Jose International Airport and San Francisco International Airport have been given this designation. The standards establish a noise exposure limit "acceptable to a reasonable person residing in the vicinity of an airport" of 65 dB CNEL.

Noise Insulation Standards

The California Noise Insulation Standards found in CCR, Title 24, Part 2 (Volume 1, Chapter 12, "Interior Environment," Section 1207.11.2) establish requirements for new multifamily residential units, hotels, and motels that may be subject to relatively high levels of transportation noise. In this case, the noise insulation criterion is 45 dB L_{dn}/CNEL inside habitable, noise-sensitive spaces. For developments with exterior transportation noise exposure (e.g., freeway, expressway, parkway, major street, thoroughfare, airport, rail line, rapid transit line noise) exceeding 60 dB L_{dn}/CNEL, an acoustical analysis and mitigation (if required) must be provided showing compliance with the 45 dB L_{dn}/CNEL interior noise exposure limit.

REGIONAL AND LOCAL REGULATIONS

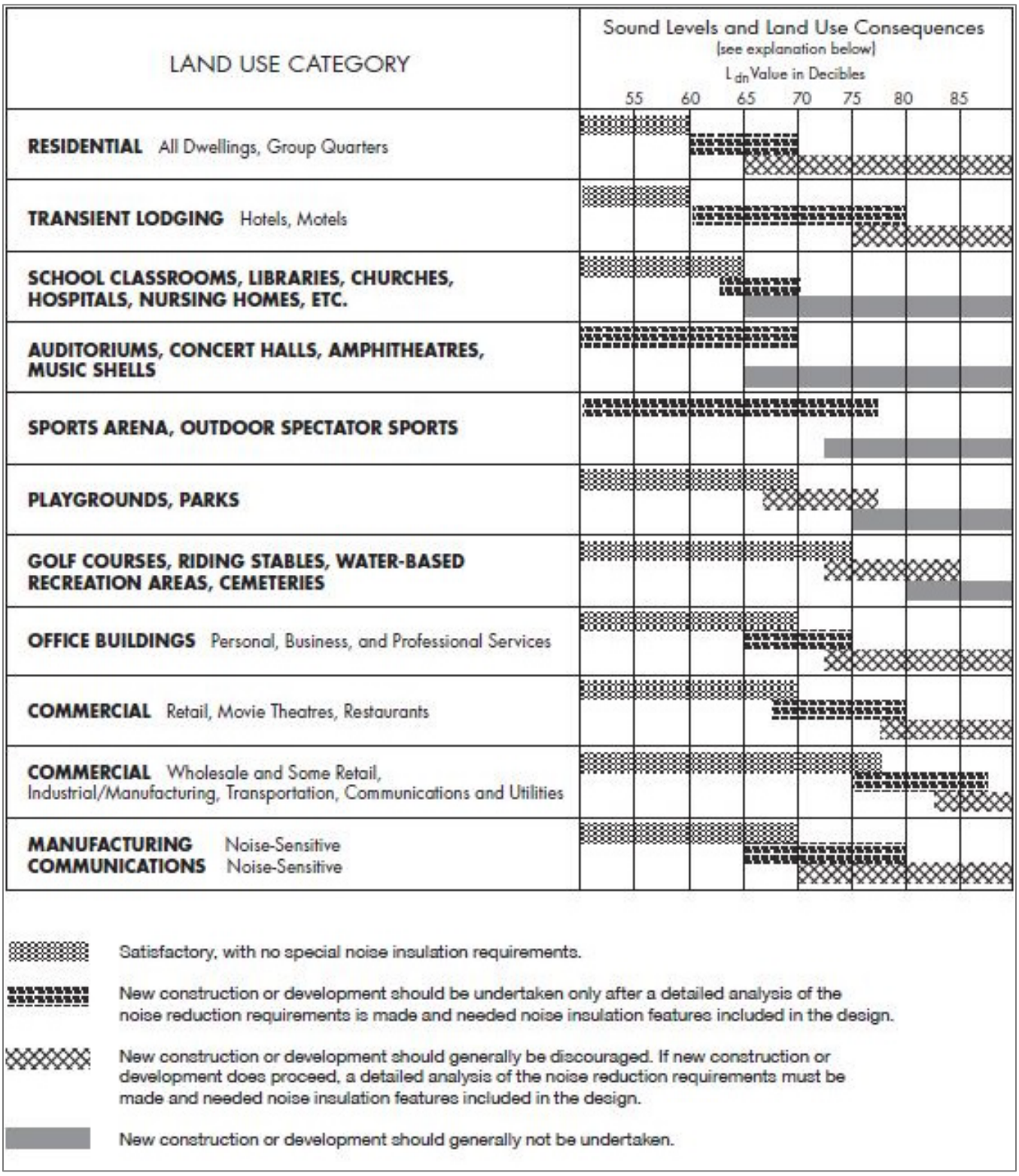
City and County General Plans

Cities and counties in California must adopt a noise element as part of their general plans to identify, assess, and provide mitigation for noise problems in their communities. According to California Government Code Section 65302, the noise element of a general plan is to be used as "a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise." The noise element should assess current and projected future noise levels associated with local noise sources, consisting of, but not limited to, traffic, trains, aircraft, and industrial operations. California general plan guidance establishes land use compatibility guidelines for various land uses and considers exterior noise levels of below 60 dBA CNEL as normally acceptable for low-density residential land uses, and below 65 dBA CNEL as normally acceptable for multifamily residential land uses. Local jurisdictions may adopt their own noise exposure goals and policies, which may or may not be the same as or similar to those recommended by the State.

In general, State guidance reflects the fact that noise-sensitive land uses are compatible with exterior transportation-related noise exposure not exceeding 65 dB L_{dn}/CNEL, typical standards for suburban areas. However, urban development, such as would occur in transit priority areas, which are required to be near transit, typically near highly trafficked roadways, are frequently located in areas subject to higher noise, and local standards often provide that higher noise levels are conditionally acceptable for residential uses in such areas, so long as it can be demonstrated that interior noise levels would be acceptable, as discussed further below. One example of an urban area with higher noise compatibility standards is the city of San Francisco, which lists noise levels as high as 70 dB L_{dn}/CNEL as conditionally acceptable for residential land uses (see **Figure 3.12-6**). Therefore, in areas exceeding 70 dBA CNEL in San Francisco, if appropriate measures are taken to reduce noise exposure, especially interior noise levels, higher exterior noise levels are considered acceptable.

In addition, according to the Title 24 standards described above and State general plan guidelines, interior noise exposure should not exceed 45 dB L_{dn}/CNEL in noise-sensitive spaces, whether in suburban or urban environments. Standard modern building techniques and requirements, such as the use of dual-paned windows, typically reduce exterior-to-interior noise transmission by 20 to 25 dB (DOT 2011: 30). The standards in the noise elements of locally adopted general plans are for planning policy purposes and are generally not regulatory. Most jurisdictions regulate noise through their municipal code.

Figure 3.12-6: City of San Francisco Representative Land Use Compatibility Criteria



Source: City of San Francisco 2023.

The local noise code is generally applied to address noise complaints associated with non-transportation sources (e.g., public address systems, mechanical equipment) and may also address construction noise exposure/production limits. Noise exposure criteria presented in municipal codes should match performance criteria presented in the noise element of the general plan for the given jurisdiction.

Cities and counties often provide noise-level performance standards for non-transportation noise sources (e.g., commercial/industrial facilities, mechanical equipment). These standards address intermittent noise exposure and are often in terms of the hourly average noise level (i.e., L_{eq}) or maximum noise level (i.e., L_{max}). These criteria are generally tied directly to the standards presented in the city or county municipal code (i.e., noise ordinance).

3.12.5 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Criterion NOISE-1);
- generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Criterion NOISE-2);
- generate excessive groundborne vibration or groundborne noise levels (Criterion NOISE-3); or
- for a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public-use airport, expose people residing or working in the project area to excessive noise levels (Criterion NOISE-4).

The following impact discussions include numeric thresholds that apply to the applicable significance criteria, where appropriate.

METHOD OF ANALYSIS

The method for the programmatic analysis of noise and vibration impacts is described below. Because this analysis is programmatic and focuses on impacts of the proposed plan on a regional basis, it does not account for site-specific conditions (elevation differences, noise barriers, precise site conditions, detailed traffic conditions). Project-specific noise or acoustical analyses may be required as part of the environmental review prior to project approval by the appropriate lead agency. The baseline for this analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025. However, impacts relying on analysis from Travel Model 1.6 reflect existing conditions as 2023 because it is the most recent year for which comprehensive land use, and traffic levels are available for the Bay Area region.

Construction Noise

Construction noise can be characterized based on the type of activity and associated equipment needed. Because of the programmatic nature of this analysis, construction timelines, required activities, and construction equipment lists are not currently available. Although precise construction noise impacts cannot be determined without specific project and property information, the analysis does assess the

potential for construction noise impacts using a modeling scenario likely to represent actual conditions. To evaluate potential construction noise impacts, reference noise levels associated with six pieces of construction equipment, including two of the loudest pieces of equipment (i.e., an impact pile driver and a crane), were used to model construction noise levels associated with the types of projects anticipated to be developed under the proposed plan (e.g., roadway improvements, land use development). Reference noise levels for specific equipment or activity types are well documented, and the usage thereof is common practice in the field of acoustics. Construction source noise levels were determined based on methodologies, reference emission levels, and usage factors from the FTA *Guide on Transit Noise and Vibration Impact Assessment* methodology (FTA 2018) and FHWA *Roadway Construction Noise Model User's Guide* (FHWA 2006).

Construction noise standards vary by jurisdiction throughout the plan area but generally limit construction activities to times when noise would have the least effect on nearby land uses (i.e., during the daytime). In addition, some cities include robust construction noise ordinances that contain either property line performance standards relative to the duration of construction, receiving land use, and time of day (Oakland Planning Code Section 17.120.050) or restrict construction-related activities within a specific distance of a residential unit to certain hours of the day (City of San Jose Municipal Code Section 20.100.450). Consequently, depending on the project location, extent of construction activities involved, and the proximity of construction to existing receptors, localized construction-related noise effects may vary substantially throughout the plan area. Therefore, this analysis applies the following criteria to evaluate the temporary effects of construction noise:

- FTA-recommended daytime (i.e., 90 dBA L_{eq}) and nighttime (80 dBA L_{eq}) noise standards for sensitive land uses;
- Caltrans: 86 dB L_{max} at 50 feet; and
- 5+ dBA increase in short-term noise levels (5 dBA is the threshold at which noise is readily perceptible [Caltrans 2013]).

However, individual projects associated with the proposed plan would be subject to the requirements of applicable agencies (e.g., local).

Operational Noise

Traffic Noise

For this noise analysis, 24-hour CNEL traffic noise levels were modeled using outputs from Travel Model 1.6, including traffic volume, speed information, vehicle type, and time of day volume profiles. The modeled traffic noise levels are based on average daily traffic volumes occurring on every road type (i.e., freeway, expressway, arterial, collector) throughout each county. Therefore, reported noise levels represent average noise levels by roadway type in each county within the plan area. The existing year (2023) condition was compared to the proposed plan (2050) to evaluate the proposed plan. The analysis reports the potential for noise impacts associated with absolute noise levels, as well as substantial increases in noise.

According to the range of existing standards in the plan area, a traffic noise impact would occur if a project exceeded exterior noise levels of 70 dBA CNEL associated with noise levels from major freeways/expressways and 65 dBA CNEL from major arterial, collector, and other roadway types. Freeways and expressways are designed to accommodate high traffic volumes and vehicle speeds and therefore typically represent the primary sources of transportation-related noise. Transit corridors may also contribute to localized noise levels, particularly where bus or rail service is frequent or involves high-capacity vehicles. Further, these types of facilities are typically concentrated in urban areas in proximity to commercial centers where ambient noise levels are highest. For these reasons, these facilities are

inherently noisy and contribute substantially to ambient noise levels. Major arterials, collectors, and other roadway types do not carry as much traffic as freeways and expressways and typically extend beyond the centralized urban core to potentially quieter areas less influenced by freeways. Therefore, these roadway types result in lower noise levels than freeways, expressways, and transit corridors and use lower significance thresholds because they serve fewer urban areas.

In addition to the use of an absolute noise threshold for traffic noise, relative noise increases with the implementation of the proposed plan were also evaluated. As ambient noise levels increase, a smaller increase in noise is sufficient to cause annoyance (FTA 2018). Therefore, when existing noise levels exceed applicable thresholds, a smaller increase threshold was applied. Specifically, in this analysis, a "substantial" traffic noise increase is defined as an increase of 1.5 dBA or more if existing traffic noise levels are already above thresholds defined above (i.e., 70 dBA CNEL on freeways and expressways and 65 dBA for all other roadway types) or an increase of 3 dBA or more if existing traffic noise levels are below the thresholds.

Existing traffic noise in the plan area has been characterized by traffic noise modeling. The existing conditions for the traffic noise analysis is a simulation of 2023 traffic patterns using Travel Model 1.6. According to modeling conducted for all roadway types in the plan area, average noise levels in the 2023 existing conditions range from 54.5 dBA CNEL (near collectors and small roads) to 76.8 dBA CNEL (near freeways). Traffic noise modeling results are presented in **Table 3.12-7** (refer to Appendix E for modeling details). Changes in the land use growth footprint and the implementation of proposed transportation strategies, such as tolling and speed limits, would affect the distribution of vehicle travel throughout the region.

Bay Area UrbanSim 2.6 and Travel Model 1.6 allow the proposed plan (2050) traffic simulation to reflect both the forecasted land use growth footprint and the implementation of transportation projects and strategies. However, because Travel Model 1.6 is not sensitive to the full range of strategies in the proposed plan, the results presented in **Table 3.12-7** and throughout this analysis do not account for the implementation of transportation strategies, such as Strategy EN9, "Expand Transportation Demand Management Initiatives," due to limitations that do not allow for the distribution of the vehicle miles traveled (VMT) reductions by county. Therefore, this impact assessment includes overall VMT increases from implementing both the land use growth footprint and transportation projects under the proposed plan.

With respect to transportation strategies, freeway volumes are projected to go down with application of plan strategies, including Strategy T5, "Implement Pricing Strategies to Manage Demand" and Strategy T10, "Advance Regional Vision Zero Policy through Street Design and Reduced Speeds," both of which are designed to reduce freeway traffic and, thus, per capita VMT. In addition, traffic noise modeling for the proposed plan does not account for noise attenuation provided by existing noise barriers and, therefore, represents a conservative and worst-case approach.

Transit Noise

With regard to transit noise, existing noise levels were determined based on available data for transit (e.g., BART, Caltrain) within the plan area. Increases in transit noise were not modeled but evaluated based on the best available information, such as growth projections and ridership data. Consistent with the method used to establish the noise compatibility thresholds discussed above, transit noise was also evaluated by considering existing noise levels and reviewing applicable noise standards already established by local agencies. To assess long-term permanent increases in transit noise, the following criteria were used:

- based on the range of existing standards in the plan area, exceeds project-specific exterior noise levels of 70 dBA CNEL;
- California Building Code and California General Plan guidelines recommended interior noise levels of 45 dBA CNEL; or

- result in a long-term perceptible increase in ambient noise levels (1.5 dBA or greater) in an area where the applicable noise threshold is already exceeded; in areas where applicable thresholds are not exceeded, a 3-dBA increase or greater would be considered substantial.

Table 3.12-7: Average Noise Levels by Roadway Type by County

County	Roadway Type	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) 2023 (Existing)	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) 2050 Plan	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) Net Change (dB)
Alameda	Freeway	**76.5**	**75.7**	-0.8
	Expressway	**72.7**	**73.9**	+1.2
	Major Arterial	63.7	63.4	-0.3
	Collector and Other	56.9	60.1	**+3.2**
Contra Costa	Freeway	**75.6**	**74.0**	-1.7
	Expressway	**70.8**	**71.1**	+0.2
	Major Arterial	61.8	61.5	-0.3
	Collector and Other	56.8	59.2	+2.4
Marin	Freeway	**75.0**	**72.0**	-1.3
	Expressway	n/a	n/a	n/a
	Major Arterial	62.3	60.4	-1.9
	Collector and Other	55.6	56.3	+0.7
Napa	Freeway	**75.0**	**71.4**	-3.6
	Expressway	**72.7**	**72.0**	-0.7
	Major Arterial	63.7	61.6	-2.1
	Collector and Other	55.7	56.7	+0.9
San Francisco	Freeway	**76.8**	**76.2**	-0.6
	Expressway	68.6	69.6	+1.0
	Major Arterial	64.5	64.4	-0.1
	Collector and Other	54.4	58.3	**+3.9**
San Mateo	Freeway	**76.3**	**75.1**	-1.2
	Expressway	**71.2**	**72.6**	+1.3
	Major Arterial	62.2	62.4	+0.2
	Collector and Other	56.4	59.4	**+3.0**
Santa Clara	Freeway	**75.0**	**74.2**	-0.8
	Expressway	**70.8**	**73.3**	**+2.5**
	Major Arterial	62.7	62.7	0.0
	Collector and Other	55.8	58.8	**+3.1**

County	Roadway Type	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) 2023 (Existing)	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) 2050 Plan	Modeled Traffic Noise (CNEL/L_{dn} [dBA] at 100 feet from Roadway Centerline) Net Change (dB)
Solano	Freeway	**75.9**	**72.3**	-3.6
	Expressway	69.0	68.8	-0.2
	Major Arterial	60.6	58.9	-1.7
	Collector and Other	56.5	57.7	+1.1
Sonoma	Freeway	**73.1**	**70.9**	-2.2
	Expressway	**71.7**	**70.7**	-1.0
	Major Arterial	63.0	61.8	-1.2
	Collector and Other	59.1	60.1	+1.1

Notes: CNEL = community noise equivalent level; L_{dn} = day-night average level; dBA = A-weighted decibel; dB = decibel.
Bolded text represents areas that exceed project-specific maximum noise exposure limits (i.e., 70 dBA CNEL for freeways and expressways and 65 dBA CNEL for major arterials, collectors, and all other roads) and where a substantial permanent increase in noise of 1.5 or greater or 3.0 dB or greater would occur.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Stationary Noise

This impact analysis assesses also how new stationary noise sources associated with the implementation of the proposed plan could affect the noise environment. Due to the programmatic nature of this analysis and the localized nature of stationary noise sources, operational stationary noise levels cannot be accurately modeled. Therefore, this analysis identifies potential stationary noise sources and reference noise emission levels for activities and equipment associated with future development (e.g., building HVAC equipment, transit facility noise) and assesses potential noise impacts qualitatively.

A comprehensive review of noise compatibility standards for cities and counties in the plan area was conducted, and it revealed widely varying standards of noise levels that are considered acceptable for different land uses (e.g., residential, commercial, and schools). However, the overarching theme identified was that acceptable noise levels for sensitive land uses likely to be located in urbanized and densely populated areas, such as downtowns or near major roadways or transit corridors (e.g., US Highway 101, BART right-of-way), would be higher than for land uses that would in suburban or rural areas.

Under the proposed plan, the land use growth footprint would be primarily focused in existing urbanized areas and highly concentrated in the largest cities in the plan area (e.g., San Francisco, Oakland, and San Jose), which currently experience relatively high noise levels. Therefore, considering the relatively high noise environment where development would occur and available guidance from the State and local jurisdictions within the plan area, the noise compatibility thresholds described above were established based on the range of standards in the region. In addition to exterior noise compatibility guidelines, this analysis also considers interior noise standards set by the California Building Code.

Construction Vibration

Construction activities could potentially expose nearby structures and people to ground vibration levels that result in structural damage or negative human response. Because of the programmatic nature of this analysis, a detailed construction equipment list is not available. Although precise construction vibration impacts cannot be determined without specific project and property information, the analysis does assess the potential for construction noise vibration under scenarios likely to represent actual conditions.

Construction activities that could expose people to excessive vibration, resulting in sleep disturbance or prolonged disruption to daily activities/work, are more likely to occur during construction activities that involve impact equipment (e.g., pile drivers, blasting). Blasting equipment is typically required to remove rock, and pile drivers are typically required for building larger structures, such as bridges and multistory buildings. Projects associated with the proposed plan could include roadway widenings. Therefore, it can be assumed that this type of equipment would be used for some construction activities associated with development under the proposed plan. More typical construction activities associated with the development of the proposed plan would include less vibration-intensive equipment, such as bulldozers and graders. Cities and counties, including the jurisdictions in the plan area, typically do not establish individual quantitative standards for construction-related vibration. Thus, to evaluate vibration levels from transit-related vibration, Caltrans and FTA guidance was used. Caltrans guidance was used to evaluate potential structural damage to existing structures from construction vibration activities, and FTA vibration criteria were used to evaluate potential disturbance to sensitive receptors from vibration. Specifically, the following criteria were used:

- Caltrans-recommended vibration levels for risk of architectural damage to normal dwelling houses: 0.2 PPV in/sec, and
- FTA vibration impact criteria for sensitive land uses to frequent events: 72 VdB.

Construction vibration levels and contour distances were determined based on methodologies, reference emission levels, and usage factors in the FTA *Guide on Transit Noise and Vibration Impact Assessment* (FTA 2018). Reference levels for vibration emissions for specific equipment types are well documented, and the usage thereof is common practice in the field of acoustics.

Operational Vibration

FTA guidance was used to evaluate vibration levels from transportation-related vibration. Generally, available data (e.g., the increase in the number of additional hourly train pass-by events) are insufficient to provide a detailed analysis; therefore, vibration impacts were assessed using the best available data from published sources and established reference vibration levels.

Airport Noise

Detailed quantitative analysis of potential impacts related to people residing by or working near public-use and private airports and military airfields is not practical given the high level of the proposed plan. Therefore, the analysis is largely qualitative. The following guidance was used to evaluate impacts related to airport noise:

- California Airport Noise Standards, Title 21, Section 5000: 65 dBA CNEL, and
- Federal Interagency Committee on Aviation Noise: 65 dBA (interior) single-event noise levels.

IMPACTS AND MITIGATION MEASURES

Impact NOISE-1: Generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (PS)

Land Use Impacts

This impact analysis focuses on construction-related noise effects. Please see Impact NOISE-2 for a discussion of operation-related noise effects. As discussed above in Section 3.12.1, "Environmental Setting," noise levels, including construction-related noise, dissipate rapidly from the source. Therefore,

sensitive land uses that are closest to activities are of greatest concern when evaluating construction noise. In addition, construction activities are typically temporary and change throughout the day.

As explained in Section 3.1, "Approach to the Analysis," the regional growth forecast for the Bay Area projects that between 2020 and 2050, the region will grow by 1.8 million residents, 1.4 million jobs, 1 million new households, and 1.5 million new housing units. To accommodate the projected regional growth forecast, the proposed plan designates Growth Geographies and identifies a set of land use strategies that affect the location, use, and density of the land use growth footprint.

Implementation of the proposed plan's forecasted development pattern would result in construction activities that could result in temporary noise impacts associated with grading, excavating, earthmoving, paving, building or structure construction, and other related activities. Construction activities would require the use of various noise-generating construction equipment, such as dozers, loaders, forklifts, cranes, jackhammers, pile drivers, paving equipment, and trucks. These types of heavy-duty equipment generate noise in the immediate vicinity of the source, often resulting in temporary noise levels that are substantially higher than existing conditions. **Table 3.12-2** summarizes typical construction noise levels for various pieces of construction equipment. However, noise effects from construction activities depend on several factors, including the types of surrounding land uses, duration and type of construction activities, distance between source and receptor, existing ambient noise levels, and the presence or absence of barriers between source and receptor.

Because of the regional scale of the proposed plan and the programmatic level of this analysis, and because specific development projects have not been proposed, specific construction-related details (e.g., location, schedule, equipment type/number) for individual land use development projects are not available. Therefore, as detailed under "Methods of Analysis," a representative construction scenario, including typical equipment (i.e., pile driver, cranes, trucks, generators, jackhammers, backhoes) was assumed to evaluate potential construction impacts. According to reference noise levels for these types of construction equipment (shown in **Table 3.12-2**), construction noise could reach levels of 94.5 dBA L_{eq} and 101.4 dBA L_{max} at 50 feet from construction sites (see Appendix E for modeling inputs and results). Although other specialized equipment may be used (e.g., for tunnel boring), the modeling scenario includes the simultaneous operation of two of the loudest pieces of construction equipment (i.e., jackhammer and impact pile driver), which would generate similar or louder noise levels compared to other specialized equipment. Thus, modeled construction noise levels are conservatively high.

Construction noise could exceed the FTA-recommended daytime (i.e., 90 dBA L_{eq}) and nighttime (i.e., 80 dBA L_{eq}) noise standards for residential receptors within approximately 84 feet (daytime) and 265 feet (nighttime) of construction activity, respectively. Construction noise also would exceed the Caltrans noise standard (i.e., 86 dB L_{max}) within approximately 294 feet of construction activity (see Appendix E for modeling inputs and results). Therefore, according to the modeling conducted, construction-related noise levels could exceed applicable construction-related noise standards and thresholds, depending on proximity to existing sensitive land uses and duration of construction activities. In addition, although construction noise is short term, it can nonetheless result in substantial increases in noise (e.g., 5+ dBA) in ambient noise levels in the immediate vicinity of a construction site. Therefore, construction-related noise associated with the land use growth forecast could exceed applicable noise thresholds, resulting in a potentially significant (PS) noise impact.

Sea Level Rise Adaptation Impacts

The proposed plan includes sea level rise adaptation projects to protect communities in regularly inundated shoreline areas that may be affected by sea level rise. Implementing these sea level rise adaptation projects would result in the construction of various levees, seawalls, elevated roadways, marsh restoration, and tidal gates. Construction of such projects could result in temporary construction

noise impacts associated with grading, excavating, earthmoving, and other related activities. The associated noise levels would be like those presented above for construction associated with land use development projects because similar construction equipment would be used.

Like construction noise levels associated with forecasted development pattern, temporary noise levels generated by construction of sea level rise adaptation projects could exceed local standards and thresholds identified, depending on proximity to existing sensitive land uses and duration of construction activities. Therefore, implementing the proposed plan's sea level rise adaptation projects may result in the generation of excessive temporary construction noise levels, which would be potentially significant (PS).

Transportation System Impacts

Construction-related noise impacts of transportation projects, like those discussed above, would depend on the extent of construction being undertaken, proximity to existing sensitive land uses, and applicable noise standards. Construction activity could require heavy-duty construction equipment, such as bulldozers and cranes. In addition, some transportation network improvements, such as roadway expansion, could require a pile driver, which is typically required for building large structures. However, because of the regional scale of the proposed plan, specific construction-related details (e.g., location, schedule, equipment type/number) for individual projects are currently unknown. Therefore, the same representative construction scenario described under "Land Use Impacts" was assumed for transportation system projects to evaluate potential construction impacts. According to reference noise levels for the assumed types of construction equipment (shown in **Table 3.12-2**) and accounting for typical usage factors, construction noise could reach levels of 94.5 dBA L_{eq} and 101.4 dBA L_{max} at 50 feet from future proposed construction sites. Refer to Appendix E for modeling inputs and results. According to the modeling conducted, construction noise levels could exceed FTA-recommended exterior residential daytime and nighttime construction noise standards of 90 dBA L_{eq} and 80 dBA L_{eq}, respectively, and Caltrans-recommended levels (i.e., 86 dBA L_{max} at 50 feet). In addition, depending on proximity to existing land uses, existing ambient noise levels, and duration and timing of construction activities, construction could result in a substantial (e.g., 5+ dBA) increase in noise.

Construction of transportation network improvements under the proposed plan could increase noise levels for the reasons described above. In addition, as discussed above, transportation system projects would have the potential for localized noise impacts, particularly when pile driving or other similar invasive foundation work may be required. The effects of construction noise would be of greatest concern to the land uses closest to construction activities.

Proposed transportation projects are spread throughout the Bay Area and are generally limited to existing transportation corridors. Refer to **Table 2-9** and **Figure 2-4** (see Chapter 2, "Project Description") for specific transportation project types and locations. In addition, transportation projects typically progress linearly (i.e., along the right-of-way), and nighttime construction is sometimes required to minimize traffic congestion during peak travel periods. Therefore, construction activities could affect individual receptors for shorter periods of time because elevated noise levels would only occur temporarily in the location where the construction occurs before moving along the right-of-way. However, such activity could result in greater disturbance to nearby receptors if construction occurs during evening and nighttime hours when residents are generally more susceptible to noise disturbance.

For these reasons, construction noise associated with the implementation of transportation projects would be potentially significant (PS).

Conclusion

Because implementation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects could result in substantial construction noise levels such that

nearby receptors could be adversely affected and applicable noise standards exceeded, this impact is considered **potentially significant (PS)**. Mitigation Measure NOISE-1 addresses this impact and is described below.

Mitigation Measures

Where feasible and as applicable, implementing agencies and/or project sponsors shall implement measures based on project- and site-specific considerations, including those identified below.

Mitigation Measure NOISE-1 To reduce construction noise levels to achieve the applicable noise standards of the relevant jurisdiction in the plan area, implementing agencies and project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- Comply with local construction-related noise standards, including restricting construction activities to permitted hours as defined under local jurisdiction regulations.
- Notify residents and occupants within 294 feet of the project construction area at least 30 days in advance of anticipated times when noise levels are expected to exceed limits established in the noise element of the general plan or noise ordinance.
- Designate an on-site construction complaint and enforcement manager for the project.
- Post procedures and phone numbers at the construction site for notifying the implementing agency staff and construction contractor (during regular construction hours and off-hours), along with permitted construction days and hours, complaint procedures, and who to notify in the event of a problem.
- Properly maintain construction equipment and outfit construction equipment with the best available noise suppression devices (e.g., mufflers, silencers, wraps). Equipment engine shrouds shall be closed during equipment operation.
- Prohibit the idling of construction equipment for extended periods of time in the vicinity of sensitive receptors.
- Locate all stationary equipment (e.g., generators, compressors, rock crushers, and cement mixers) and staging areas as far as possible from nearby noise-sensitive receptors, or locate such equipment to the extent feasible such that an existing or constructed noise attenuating feature (e.g., temporary noise wall or blanket) blocks the line of sight between affected noise-sensitive receptors and construction staging areas.
- Use hydraulically or electrically powered tools (e.g., jack hammers, pavement breakers, and rock drills) for project construction to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust should be used. External jackets on the tools themselves should be used, if such jackets are commercially available.
- Quieter procedures should be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.
- For construction activity that would occur within a clear line of sight of an adjacent off-site sensitive receptor (as defined by the local jurisdiction), take place outside of hours during which construction activity is exempt from local noise standards, and exceed applicable construction noise standards or thresholds, the construction contractor shall install temporary sound barriers to attenuate noise, such as temporary noise curtains, sound walls, or similar products that provide a barrier to construction noise. The temporary sound barrier shall be located between the project construction noise sources and receptors to shield the receptors from construction noise. When installed properly,

acoustic barriers can reduce construction noise levels by approximately 8–10 dB (EPA 1971). The installation of any temporary sound barrier shall meet all the following criteria:

- be installed as close as feasible to the boundary of the construction site within the direct line of sight path of the nearby sensitive receptor(s);
- consist of durable, flexible composite material featuring a noise barrier layer bound to sound-absorptive material on one side; and
- consist of rugged, impervious material with a surface weight of at least 1 pound per square foot, such that a minimum of 10 dBA reduction is achieved on the receiving side of the sound barrier.

Significance after Mitigation

Implementation of Mitigation Measure NOISE-1 would provide reductions in daytime and nighttime construction noise levels by ensuring proper equipment use, locating equipment away from sensitive land uses, and requiring the use of enclosures, shields, and noise curtains. Implementation of these noise-reduction features would reduce construction noise levels by approximately 10 dBA or more (NCHRP 1999; EPA 1971). To the extent that a local agency requires an individual project to implement all applicable mitigation measures described above, construction noise levels could be reduced by 10 dBA. Greater reductions may be achieved and the frequency and intensity of construction-related noise at nearby receptors may be further reduced, depending on actual construction activities and proximity to receptors. However, there could be cases where noise-level reductions from implementation of mitigation would not be sufficient to reduce noise to an acceptable level. This impact would remain significant and unavoidable (SU).

Projects taking advantage of the CEQA streamlining provisions of Senate Bill (SB) 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact NOISE-2: Generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (PS)

Land Use Impacts

As noted above, this impact discussion focuses on the operation-related noise impacts of proposed plan implementation. The proposed plan's land use growth footprint occurs throughout the region. Many of the Growth Geographies in the proposed plan are purposely located along existing and projected transit corridors to facilitate a reduction in VMT in the region. Nevertheless, land use development would result in increased traffic and subsequent traffic noise increases. Transit noise exposure would vary greatly depending on proximity to existing noise sources (e.g., transit corridors) and ambient noise levels, and typically, urbanized areas where most development would occur would experience higher noise levels compared to more rural or less densely populated areas. In addition, land use development would include new stationary noise sources (e.g., HVAC equipment, truck loading/unloading), which would also contribute to the noise environment. Noise exposure and effects would vary depending on the proximity of sensitive receptors to existing and new noise sources (e.g., transit corridors) and ambient noise levels. Traffic and stationary noise sources are discussed separately below.

Land Use–Related Traffic Noise

Implementation of the proposed plan would result in a mixture of development and redevelopment within the land use growth footprint throughout the plan area, primarily in designated Growth Geographies. As detailed in Chapter 2, "Project Description," 77% of the land use growth footprint would occur within land designated as urban built-up and where roadways have high levels of vehicle use. Changes in land use due to forecasted growth would generate new trips, and these trips would be distributed on existing and potentially expanded roadways. Roadway volumes would increase on some roadways in the region and decrease on others, depending on the land use growth footprint relative to the local roadway system.

Traffic noise impacts were assessed at the county level, and traffic noise modeling was conducted using the most recently available data (2023) and buildout (2050) scenarios. Traffic noise modeling results represent both regional and local noise levels, but because projected noise is based on outputs from the regional travel demand model (Travel Model 1.6), the noise modeling outputs are necessarily imprecise and should be treated as generally representative of likely noise levels and changes from baseline conditions. As detailed under "Methods of Analysis," to assess long-term permanent increases in traffic noise, the following criteria were used:

- based on the range of existing standards in the plan area, exceeds project-specific exterior noise levels of 70 dBA CNEL associated with noise levels from major freeways/expressways and 65 dBA CNEL from all other roadway types;
- California Building Code and California General Plan Guidelines–recommended interior noise levels of 45 dBA CNEL for any roadway type; and
- results in a long-term perceptible increase in the ambient noise level (1.5 dBA or greater) in an area where the applicable noise threshold is already exceeded; in areas where applicable thresholds are not exceeded, a 3 dBA increase or greater would be considered substantial.

Table 3.12-7 identifies existing and existing-plus-proposed-plan average noise levels by roadway type (e.g., freeways, expressways, major arterials, and collectors) for each county in the plan area and identifies significant noise increases in bold text. According to the modeling conducted and indicated by bold numbers within the existing conditions column in **Table 3.12-7**, average noise levels on freeways under existing conditions exceed applicable noise thresholds of 70 dBA CNEL in every county in the region. In addition, existing noise levels on expressways exceed the 70 dBA threshold for expressways in all counties except Marin, San Francisco, and Solano Counties. Existing average noise levels on smaller roads, such as major arterials and collectors, do not currently exceed levels of 65 dBA CNEL (i.e., threshold applied to roads other than freeways/expressways) in any county.

As shown in **Table 3.12-7**, traffic noise increases that would result from the projected land use growth footprint would not exceed the absolute noise-level threshold for major arterial, collector, and other roadways (i.e., 65 dBA CNEL) in the plan area. However, traffic noise increases would continue to exceed the applicable CNEL absolute noise-level threshold of 70 dBA CNEL along all freeways in the plan area and along all expressways except those in Marin, San Francisco, and Solano Counties. In addition, as shown in **Table 3.12-7**, increases in traffic-related noise would occur with implementation of the proposed plan, with increases ranging from 0.2 dBA to 3.9 dBA.

Regarding interior noise thresholds of 45 dBA CNEL, buildings provide varying degrees of exterior-to-interior noise reduction but typically can achieve a minimum 25 dBA reduction. Therefore, receptors in areas experiencing noise levels below the exterior noise thresholds of 70 dBA CNEL would also experience acceptable interior noise levels of 45 dBA CNEL (i.e., areas further away from a freeway's 70 dBA CNEL contour). According to the modeling conducted, under existing conditions, freeway 70 dBA CNEL contours within the plan area range from a minimum distance of 224 feet to a maximum distance of 488 feet from the freeway centerlines. With implementation of the proposed plan, freeway 70 dBA CNEL contours in the

plan area would range from a minimum distance of 135 feet to a maximum distance of 468 feet from the freeway centerlines, a decrease of 20 feet (see Appendix E for noise contour details) over existing conditions. In other words, the plan would result in a slight noise reduction on the overall freeway network within the plan area.

Given that exterior noise levels associated with freeways in the plan area currently exceed 70 dBA CNEL (up to 488 feet from the freeway centerlines) and would continue to exceed 70 dBA CNEL (up to 468 feet from the freeway centerline) under the proposed plan, the interior noise thresholds may also be exceeded in these areas. Although interior and exterior noise levels may continue to exceed traffic noise thresholds, these exceedances would be less pronounced along most roadway types in the plan area compared to existing conditions, as shown in **Table 3.12-7**.

Nevertheless, because the proposed plan would result in traffic noise levels that exceed interior noise thresholds and the absolute noise threshold for freeways and expressways (i.e., 70 dBA CNEL), and would result in a substantial noise increase (i.e., 1.5+ dBA where existing traffic noise levels are already above absolute noise-level thresholds or an increase of 3 dBA+ where existing noise levels are below the thresholds) in some areas, this impact would be potentially significant (PS).

Land Use–Related Stationary and Community Noise Sources

Typical community noise sources in the plan area include small mechanical devices (e.g., lawn mowers, leaf blowers), parks and playgrounds, restaurants and bars, commercial uses, and industrial plants. Stationary sources may include HVAC units, delivery trucks loading and unloading at commercial land uses, and other equipment associated with commercial and industrial land uses (e.g., pumps, back-up generators, auto body shops). Stationary equipment and community noise are typically regulated through local municipal codes, which provide performance-based noise standards specific to the noise source and give the local jurisdiction the ability to enforce noise standards. To assess long-term increases in stationary noise sources, the following criteria were used:

- based on the range of existing standards in the plan area, exceeds exterior project-specific noise levels of 70 dBA CNEL (applicable to urban areas/mixed-use areas) and 65 dBA CNEL (applicable to suburban/rural areas), and
- California Building Code and California General Plan Guidelines–recommended interior noise level of 45 dBA CNEL (land use compatibility all noise sources and land use).

The proposed plan's forecasted development pattern would result in new residential, commercial, and industrial land uses that could include new stationary sources (e.g., HVAC units, mechanical equipment) and generate increased levels of community noise. While the exact magnitude of increased noise from the introduction of new land uses is speculative, it is foreseeable that in certain locations, the noise associated with implementation of the forecasted land use growth footprint could introduce noise levels that exceed applicable noise standards or result in a substantial permanent increase in noise.

Typical community noise sources associated with residential land use include small mechanical devices for residential maintenance (e.g., lawnmowers, leaf blowers), and HVAC equipment. Noise levels from residential maintenance equipment could range between 88 and 99 dBA at 3 feet (Berger et al. 2010). Noise levels from HVAC equipment can vary depending on the unit efficiency, size, and location, but generally ranges from 60 to 70 dBA L_{eq} at 3 feet (Carrier 2022). Commonly installed building equipment, such as HVAC systems and emergency generators, can be located within the interior of a structure, on rooftops, or in direct line of sight to adjacent land uses. Depending on the proximity to sensitive receptors, noise levels associated with mechanical devices and HVAC systems could exceed applicable noise standards at nearby noise-sensitive receptors and could result in a substantial increase over existing ambient noise levels (i.e., 5+ dBA).

Stationary noise sources associated with commercial and industrial land uses may include delivery trucks loading and unloading at commercial land uses, large HVAC equipment, and other equipment associated with commercial and industrial land uses (e.g., pumps, back-up generators). As discussed above, detailed information regarding the stationary equipment to be installed for new facilities constructed under the proposed plan is not available. However, noise levels commonly associated with larger commercial-use air conditioning systems can reach levels of up to 70 dBA Leq at 3 feet (Lennox 2020). Reference noise-level measurements of emergency generators with rated power outputs from 50 to 125 kilowatts (kw) result in noise levels ranging from 61 to 73 dB Leq and 63 to 84 dB L_{max} at 45 feet (EPA 1971; FHWA 2006). According to reference noise values and accounting for typical usage factors of equipment used for commercial loading/unloading, noise levels could reach 82 dB Leq and 86 dB L_{max} at 50 feet. Stationary and community noise typically is intermittent in nature and fluctuates throughout the day. For example, HVAC units do not typically run all day but operate in short bursts, whereas noise generated at commercial loading docks may occur more frequently early in the morning when receptors are more sensitive to noise. Implementation of the proposed plan could result in new land uses that include stationary noise sources that expose existing sensitive receptors to excessive noise levels or result in a substantial increase in noise. However, the extent of new stationary noise from these land uses cannot currently be quantified, as the magnitude and location of specific sources are not known. Although specific locations for these noise sources are currently unknown, considering the projected high density of land development in already urbanized areas, where existing sensitive receptors already exist, implementation of the proposed plan's forecasted development pattern (and associated stationary noise sources) could result in the exposure of existing sensitive receptors to exterior noise levels that exceed applicable local thresholds or result in a substantial increase in noise (e.g., 1.5 dB). Therefore, this impact would be potentially significant impact (PS).

Sea Level Rise Adaptation Impacts

The proposed plan also includes sea level rise adaptation projects to protect communities that are located within regularly inundated shoreline areas that could be affected by sea level rise. The sea level rise adaptation projects would include construction of a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. For construction-related impacts refer to Impact NOISE-1 and Impact NOISE-3.

Regarding levees, seawalls, marsh restoration, and tidal gates, no long-term increases in noise would occur because these features would not include stationary equipment that generates noise. Regarding elevated roadway projects, research has shown that noise levels of traffic on elevated urban and suburban roadways, such as freeway overpasses 15–20 feet above grade, are no greater or even less than noise levels generated by traffic on at-grade roadways, largely because the direct line of sound propagation from the noise source is elevated above receptors (Zimmer and Buffington 1997). The following examples of sea level rise adaptation projects may involve elevating existing roadways 15–20 feet above grade, enough to result in noticeable decreases in noise levels, in anticipation of sea level rise:

- SR 37 Corridor - Ultimate Project (Marin, Napa, Sonoma, Solano) and
- Manzanita Sea Level Rise Project (Marin)

In addition, the elevated roads would not be widened and thus would not result in an increase in capacity, so average daily traffic volumes and associated noise would not increase as a result of sea level rise adaptation projects. Therefore, although traffic noise associated with such roadways would increase as a result of implementation of the plan, as discussed above, implementation of the sea level rise adaptation projects could reduce noise levels at the respective project locations, but at a minimum, would not result in additional increases in noise, because an elevated road could move an existing noise source out of the direct line of sight of existing receptors. For these reasons, sea level rise adaptation projects would not result in a significant change or stationary-related noise levels, and this impact would be less than significant (LTS).

Transportation System Impacts

Transit expansion projects under the proposed plan would be implemented in multiple locations throughout the plan area but would occur primarily in urbanized areas and near existing transit facilities. Such projects include:

- BART Silicon Valley Extension, Phase II— San Jose (Berryessa) to Santa Clara (Santa Clara County),
- Caltrain/California High-Speed Rail—Downtown San Francisco Extension (San Francisco),
- Capitol Corridor—South Bay Connect (Alameda County),
- SMART—Santa Rosa to Windsor (Sonoma County), and
- Valley Link—Central Valley to Livermore (Alameda County).

Transit line expansion and expanded service frequency included under the proposed plan could result in increased transit-related noise throughout the region. The effects of increased noise levels would vary greatly depending on the type of transit facility and proximity to existing sensitive land uses.

Noise from rail transit can vary depending on the frequency of trains passing throughout the day, the type of train (i.e., electric or diesel), whether a warning horn is used, and the type of track (i.e., elevated or not). According to available data for Caltrain lines within the region, 24-hour noise levels can range from 70 dBA CNEL/L_{dn} at 50 feet from the track to 82 dBA CNEL/L_{dn} at 45 feet from the track (Peninsula Corridor Joint Powers Board 2014).

Extension of passenger rail transit service, as well as increases in transit frequency, could result in the exposure of existing sensitive land uses to noise levels exceeding the thresholds developed for this analysis (e.g., 70 dBA CNEL). The severity of this impact would depend upon the type (diesel or electric powered) and frequency of rail pass-by events and the existing ambient noise level at the existing receptor. These projects are generally located in urban areas that are already exposed to high levels of vehicle traffic noise.

New transit lines or the expansion of existing transit lines would result in a new substantial noise source that could result in excessive noise exposure depending on the type of existing land uses and proximity to the new noise sources. New rail lines would likely have noise levels similar to those discussed above. Therefore, they could exceed applicable exterior (i.e., 70 dBA CNEL) and interior (i.e., 45 dBA CNEL) noise thresholds at existing sensitive land uses. In addition, because new or expanded rail lines could result in noise levels of 70 dBA CNEL and up to 82 dBA CNEL, when compared to existing conditions where no rail currently exists, noise levels would substantially increase (i.e., likely more than 3 dBA above ambient levels). Implementing agencies or sponsors of transportation projects would coordinate with local jurisdictions to comply with local policies and regulations. In addition to future project-level CEQA review, transportation projects subject to review by the FTA, Federal Railroad Administration, or the FHWA would be subject to project-level NEPA review and compliance with applicable guidance related to noise assessments and mitigation.

Because trains could generate noise levels of up to 82 dBA CNEL/L_{dn}, and transit lines are currently located in urbanized areas near major roads and freeways where noise levels are currently relatively high, a 1.5 dBA increase in transit noise would be considered significant. As explained in Impact TRA-1 in Section 3.15, “Transportation,” the proposed plan includes major investments that create new transit lines or boost frequencies on existing lines. Therefore, it is expected that implementation of the proposed plan would result in a 1.5 dBA or more increase in transit noise. Increases in transit noise on existing facilities would result in a potentially significant (PS) impact.

Conclusion

Implementation of the proposed plan’s forecasted development pattern and transportation projects could result in regional average noise increases and localized traffic-related noise levels that exceed

applicable thresholds, resulting in a substantial permanent increase in noise in some areas. However, as shown in **Table 3.12-7**, along some roadways in some counties, noise levels would decrease with implementation of the plan. In addition, sea level rise adaptation projects would not result in a significant change in traffic- or stationary-related noise levels. Implementation of the proposed plan could expose existing or new sensitive receptors to noise levels that exceed land use compatibility thresholds and could result in a permanent substantial increase in noise. New and expanded passenger rail lines would result in new noise sources and substantial increases in noise depending on proximity to existing sensitive land uses. Because of the traffic noise increases and threshold exceedances in some areas, substantial increases in stationary noise sources, and new or expanded transit services, this impact would be **potentially significant (PS).** Mitigation Measures NOISE-2(a), NOISE-2(b), and NOISE-2(c) address this impact and are described below.

Mitigation Measures

Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below.

Mitigation Measure NOISE-2(a) To reduce exposure from traffic noise when significant and to achieve the applicable noise thresholds for each roadway type (i.e., 70 dBA CNEL for major roads/freeways, 65 dBA CNEL for all other roads, or as otherwise defined in applicable local noise standards), implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations to achieve noise levels in accordance with applicable local noise standards. Measures shall include those identified below (or other equally effective measures):

- Design adjustments to proposed roadway or transit alignments to reduce noise levels in noise-sensitive areas (e.g., below-grade roadway alignments can effectively reduce noise levels in nearby areas by providing a barrier between the source and receptor).
- Use techniques such as landscaped berms, reduced-noise paving materials, and traffic-calming measures in the design of transportation projects.
- Use rubberized asphalt or “quiet pavement” to reduce road noise for new roadway segments, roadways in which widening or other modifications require re-pavement, or normal reconstruction of roadways where re-pavement is planned.
- Maximize the distance between existing noise-sensitive land uses and new noise-generating facilities and transportation systems.
- Contribute to the insulation of buildings or construction of noise barriers around sensitive receptor properties adjacent to the transportation project.
- Use land use planning measures, such as zoning, restrictions on development, site design, and buffers, to ensure that future development is noise compatible with adjacent transportation facilities and land uses.
- Monitor the effectiveness of noise-reduction measures by taking noise measurements and installing adaptive mitigation measures to achieve the standards for ambient noise levels established by the noise element of the general plan or noise ordinance.

Mitigation Measure NOISE-2(b) To reduce the exposure of existing sensitive receptors to non-transportation noise associated with the forecasted development pattern, implementing agencies and/or project sponsors shall, for projects with features that generate stationary noise that are near sensitive receptors, implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- Local agencies approving land use projects shall require that routine testing and preventive maintenance of emergency electrical generators be conducted during the less sensitive daytime hours (per the applicable local municipal code). Electrical generators or other mechanical equipment shall be equipped with noise control (e.g., muffler) devices in accordance with manufacturers' specifications.
- Maximize the distance between noise-sensitive land uses and new noise-generating facilities.
- Improve the acoustical insulation, window quality, and/or other soundproofing of dwelling units (existing or proposed) where setbacks do not sufficiently reduce noise.
- Local agencies approving land use projects shall require that external mechanical equipment, including HVAC units, associated with buildings and other stationary sources (e.g., commercial loading docks) incorporate features designed to reduce noise to below 70 dBA CNEL or the local applicable noise standard. These features may include locating equipment or activity areas in equipment rooms or enclosures that incorporate noise-reduction features, such as acoustical louvers and exhaust and intake silencers. Enclosures shall be oriented so that major openings (i.e., intake louvers, exhaust) are directed away from nearby noise-sensitive receptors. Site design considerations shall also incorporate appropriate setback distances, to the extent practical, from the noise and existing sensitive receptors to minimize noise exposure.

Mitigation Measure NOISE-2(c) To reduce transit-related noise exposure to existing receptors within 50 feet of a rail transit line to below 70 dBA CNEL, or other applicable standard, implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- When finalizing development project site plans or transportation project design, sufficient setback between occupied structures and the railroad tracks shall be provided to minimize noise exposure to the extent feasible.
- When finalizing development project site plans, noise-sensitive outdoor use areas shall be sited as far away from adjacent noise sources as possible, and site plans shall be designed to shield noise-sensitive spaces with buildings or noise barriers whenever possible.
- Prior to project approval, the implementing agency for a transportation project shall ensure that the transportation project sponsor applies the following mitigation measures (or other technologically feasible measures) to achieve a site-specific exterior noise level of 70 dBA CNEL (or other applicable local noise standard) and interior noise level of 45 dBA CNEL at sensitive land uses, as applicable for transit projects:
  - use sound reduction barriers, such as landscaped berms and dense plantings;
  - locate rail extension below grade as feasible;
  - use damped wheels on railway cars;
  - use vehicle skirts;
  - use undercar acoustically absorptive material; and
  - install sound insulation treatments for affected structures.

Significance after Mitigation

Implementation of Mitigation Measure NOISE-2(a) would result in substantial reductions in traffic-related noise. Depending on barrier construction, a 10 dBA in noise reduction is typically feasible (FHWA 2006), which would be adequate to bring the highest modeled traffic noise levels of 76.2 dBA CNEL to below the 70-dBA CNEL threshold. Site design, including proximity to the noise source, can achieve varying degrees

of noise reduction depending on the distance to the source. Building construction methods can typically achieve a minimum of 25 dB exterior-to-interior noise reduction, but much higher levels of reduction are achievable through additional wall insulation and soundproofing techniques. Implementation of Mitigation Measure NOISE-2(b) would require operational measures so that stationary noise sources would be designed to reduce noise to below 70 dBA CNEL and comply with any applicable local noise codes. Implementation of Mitigation Measure NOISE-2(c) would ensure that site-specific planning would include all technologically feasible measures to reduce transit noise to below 70 dBA CNEL for exterior noise levels and 45 dBA CNEL for interior noise levels. Further, site planning and building construction would be developed to achieve the necessary noise reduction based on site-specific parameters. To the extent that a local agency requires an individual project to implement all feasible and as applicable mitigation measures described above, the impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact NOISE-3: Generate excessive groundborne vibration or groundborne noise levels (PS)

Land Use and Sea Level Rise Adaptation Impacts

Construction

Vibration sources include the use of impact equipment (e.g., pile driving) during construction. Construction vibration impacts are considered temporary and localized in nature because they are limited to the time during which a project is being constructed and confined to areas adjacent to the construction site.

Construction activities associated with the projected growth forecasted by the plan may result in varying degrees of temporary ground vibration, depending on the specific type and number of construction equipment used and construction activities involved (e.g., excavation, earthmoving). This analysis assesses potential vibration impacts associated with more typical construction activities that could be used, such as a vibratory roller during paving activities, as well as pile driving, which generates the highest vibration levels (FTA 2018) and is often necessary in the construction of multistory buildings (e.g., apartment buildings). Construction of sea level rise adaptation projects that would include construction of a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates also could involve pile driving, particularly associated construction of elevated roadway projects.

According to FTA, vibration levels associated with pile driving are 1.518 in/sec PPV at 25 feet (FTA 2018). According to FTA's recommended procedure for applying a propagation adjustment to these reference levels, vibration levels from pile driving could exceed the Caltrans-recommended threshold for risk of damage to normal dwellings of 0.20 in/sec PPV within 55 feet of impact pile-driving activities.

A more typical piece of impact construction equipment is a vibratory roller, which is often used during paving activities and produces vibration levels of 0.21 in/sec PPV at 25 feet (for comparison, a large bulldozer generates vibration levels of 0.0089 in/sec PPV at 25 feet) (FTA 2018). A vibratory roller could exceed the threshold for risk of damage to normal dwellings within 26 feet of activity (refer to Appendix E for modeling details). Because most projected growth and associated development would occur in already urban and built-up areas, the potential exists for pile driving and vibratory rolling to occur within 55 feet and 26 feet, respectively, of an existing structure, thus exceeding Caltrans-recommended level of 0.20 in/sec PPV for structural damage.

Vibration levels can also result in interference or annoyance impacts for residences or other land uses where people sleep, such as hotels and hospitals. As discussed in Section 3.12.2, "Regulatory Setting," VdB is the metric used to evaluate human response to different levels of vibration. According to FTA, vibration levels associated with pile driving are 112 VdB at 25 feet, and vibration levels associated with vibratory rollers are 94 VdB at 25 feet (FTA 2018). FTA vibration annoyance potential criteria depend on the frequency of the vibration events. When vibration events occur more than 70 times per day, as would likely be the case with pile driving and vibratory rolling, vibration events are considered "frequent events." Frequent events that exceed 72 VdB are considered to result in a significant vibration impact. According to FTA's recommended procedure for applying propagation adjustments (i.e., modifications to the source reference vibration level to account for the distance from the equipment to the receiver) to these reference levels, vibration levels from pile driving could exceed FTA's recommended guidance for "frequent events" within 545 feet of an existing sensitive land use (refer to Appendix E for modeling details). Vibratory rollers could exceed the threshold of 72 VdB within 136 feet of an existing sensitive land use. Because the proposed plan promotes growth in urban and built-up areas, the potential exists for pile driving to occur within these impact distances of an existing sensitive land use (e.g., residence, library, school), exceeding FTA-recommended levels for vibration annoyance.

Although the exact construction details for land use development projects associated with the proposed plan are currently unknown, the potential exists for impact pile driving to occur within 55 feet of an existing structure and within 545 feet of an existing sensitive land use. Similarly, there is potential for vibratory rolling to occur within 26 feet of an existing historic structure or older building and within 136 feet of an existing sensitive land use. Therefore, construction activity could exceed Caltrans-recommended levels for structural damage (i.e., 0.20 in/sec PPV) and FTA-recommended levels for vibration annoyance (i.e., 72 VdB). This would be a potentially significant (PS) vibration impact.

Operation

Various land uses generate different amounts of vibration and groundborne noise. For example, industrial uses generate substantially more vibration and groundborne noise than residential and commercial uses, as industrial land uses often operate heavy machinery and other vibration-inducing equipment. Normal operation of residential, commercial, and mixed-use buildings is not likely to generate substantial vibration or groundborne noise. Industrial and public buildings could generate vibration and groundborne noise during operations that involve the use of heavy machinery or other vibration-inducing equipment. However, the amount of vibration produced as a result of development associated with projected growth under the proposed plan is not anticipated to be excessive, as workplace vibration is typically addressed from an occupational health and safety perspective. As with noise, vibration dissipates with distance from the source, and thus, surrounding land uses would unlikely be affected. Implementation of the land use growth footprint and strategies in the proposed plan would occur in accordance with the adopted land use plans and zoning ordinances of the cities and counties in the plan area, which typically prohibit vibration-intensive land uses (e.g., industrial) in incompatible (e.g., residential) zones. In addition, the sea level rise adaptation projects would not involve any new or modified operational sources of vibration and thus would not result in any long-term permanent increases in vibration levels. For these reasons, the vibration and groundborne noise impacts related to the operation of the land use growth footprint and sea level rise adaptation projects are not anticipated to exceed applicable vibration thresholds for structural damage or human response. This impact would be less than significant (LTS).

Transportation System Impacts

Construction

As discussed above, construction activities can generate vibration levels that exceed the thresholds for human response and structural damage depending on their proximity to existing sensitive receptors and structures. The transportation projects associated with the proposed plan that would have the greatest

potential for physical impacts would include capacity-increasing projects (e.g., adding travel lanes to freeways). Although the actual footprints and design details of most proposed transportation projects are currently unknown, pile driving, which is typically required for building large structures such as highway lanes, could be required. As detailed above, impact pile driving could exceed Caltrans-recommended thresholds of 0.20 in/sec PPV for structural damage within 55 feet of construction and the FTA threshold for adverse human response of 72 VdB within 545 of a sensitive land use (see Appendix E for modeling details). More typical construction equipment, such as a vibratory roller, could exceed the Caltrans-recommended thresholds of 0.20 in/sec PPV for structural damage within 26 feet of construction and the FTA threshold for adverse human response of 72 VdB within 136 of a sensitive land use (see Appendix E for modeling details). Therefore, the construction-related vibration impacts from transportation project implementation would be similar to those described above for the land use and sea level rise adaptation projects. This would be a potentially significant vibration impact.

Operation

Transportation infrastructure projects generate varying levels of vibration and groundborne noise. Traffic, especially heavy truck traffic, can be a source of vibration and groundborne noise. However, such vibration is rarely high enough to cause structural damage or result in adverse response because vehicles are supported on spring suspensions and pneumatic tires, which reduce the amount of vibration and groundborne noise generated from vehicular traffic. Rail operations, including freight and light rail trains, could also be a source of vibration.

As detailed in Chapter 2, “Project Description,” transit expansion projects would occur in multiple areas in the region but would occur primarily in urbanized areas and near existing transit facilities. Increases in transit-related vibration as a result of the proposed plan could occur throughout the region as transit lines are expanded and service frequency increased. However, vibration levels would vary greatly depending on the type of transit facility and proximity to existing sensitive land uses. In addition, vibration levels dissipate rapidly from the source and typically are associated with short-term events (e.g., a passing train). Therefore, vibration effects are typically limited to localized areas near the vibration source.

Extension of rail transit service to new locations as well as boosts in existing transit frequency in the Bay Area, could result in vibration levels that exceed vibration significance thresholds (i.e., levels developed by the FTA as shown in **Table 3.12-4**). Such projects include:

- BART Silicon Valley Extension, Phase II—San Jose (Berryessa) to Santa Clara (Santa Clara County),
- Caltrain/California High-Speed Rail—Downtown San Francisco Extension (San Francisco),
- Capitol Corridor—South Bay Connect (Alameda County),
- SMART—Santa Rosa to Windsor (Sonoma County), and
- Valley Link—Central Valley to Livermore (Alameda County).

As previously described, FTA provides recommended vibration levels for various land use types based on the frequency of exposure from vibration events (i.e., number of trains passing by a sensitive land use). In some areas in the region, existing development could be exposed to frequent vibration events (i.e., more than 70 trains per day), occurring adjacent to new or expanded rail lines used by BART, Caltrain, or others. The FTA-recommended level for which human disturbance would occur is 72 VdB. Therefore, based on the Generalized Ground Surface Vibration curves in the FTA guidance (FTA 2018: Figure 6-4), sensitive receptors at developments within 200 feet of a railroad could be exposed to vibration levels that exceed the recommended threshold for human disturbance of 72 VdB to frequent events (i.e., 70 or more trains passing by in 1 day).

The degree of increased vibration exposure would depend upon the type (diesel or electric powered) and frequency of rail pass-by events and the existing soil conditions at the existing receptor. Expanding or building new transit lines in unserved areas would result in a new substantial vibration source that could result in vibration effects that exceed FTA-recommended levels (i.e., 72 VdB) within 200 feet of the source. In addition, because new or expanded rail lines could result in vibration levels that exceed applicable criteria (i.e., 72 VdB) within 200 feet, when compared to existing conditions where no rail currently exists, vibration levels would substantially increase. Some of the rail extension projects identified above would expose existing sensitive receptors along extended transit alignments to excessive vibration and permanent substantial increases in vibration levels. Therefore, this would be a potentially significant (PS) impact.

Conclusion

Construction of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects could generate substantial vibration levels. The potential exists for pile driving to occur within 55 feet of an normal dwelling, exceeding Caltrans-recommended levels for structural damage (0.020 in/sec PPV for normal dwellings), and within 545 feet of an existing sensitive land use, exceeding FTA-recommended levels for vibration annoyance to frequent vibration events (i.e., 72 VdB). In addition, the potential exists for less vibration-intensive activities, such as vibratory rolling, to occur within 26 feet of a normal dwelling, exceeding the Caltrans-recommended threshold for structural damage and within 136 feet of an existing sensitive land use, exceeding the applicable FTA threshold. Implementation of the proposed plan's land use growth footprint and sea level rise adaptation projects would not result in substantial sources of operational vibration. However, new and expanded transit lines would result in new vibration sources and substantial increases in vibration depending on proximity to existing sensitive land uses. Therefore, this would be a **potentially significant (PS)** impact. Mitigation Measures Noise-3(a) and Noise-3(b) address this impact and are described below.

Mitigation Measures

Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below.

Mitigation Measure NOISE-3(a) To reduce construction vibration levels to acceptable levels (i.e., 65 VdB to 80 VdB depending on the frequency of the event and 0.1 to 0.6 PPV in/sec depending on building type), implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures):

- To minimize disturbance of receptors within 545 feet of pile-driving activities, implement "quiet" pile-driving technology (such as predrilling of piles and the use of more than one pile driver to shorten the total pile-driving duration), where feasible and as applicable, in consideration of geotechnical and structural requirements and conditions.
- To reduce structural damage, where pile driving is proposed within 55 feet of an existing structure, engage a qualified geotechnical engineer and qualified historic preservation professional (for designated historic buildings only) and/or structural engineer to conduct a preconstruction assessment of existing subsurface conditions and the structural integrity of nearby (i.e., within 55 feet) structures that would be exposed to pile-driving activity. If recommended by the preconstruction assessment, for structures or facilities within 55 feet of pile-driving activities, the project sponsors shall require ground vibration monitoring of nearby structures. Such methods and technologies shall be based on the specific conditions at the construction site. Conditions will be determined through activities such as the preconstruction surveying of potentially affected structures and underpinning of foundations of potentially affected structures, as necessary. The preconstruction assessment shall include a monitoring program to detect ground settlement or lateral movement of structures in the

vicinity of pile-driving activities and identify corrective measures to be taken should monitored vibration levels indicate the potential for building damage. In the event of unacceptable ground movement with the potential to cause structural damage, all impact work shall cease, and corrective measures shall be implemented to minimize the risk to the subject, or adjacent, structure.

- Use cushion blocks to dampen impact noise from pile driving.
- Restrict high-impact construction activities (i.e., vibratory activities that generate 0.20 in/sec PPV or more at 25 feet) within 545 feet of sensitive receptors to permitted hours in accordance with local jurisdiction regulations.

Mitigation Measure NOISE-3(b) To reduce vibration effects from rail operations, implementing agencies and/or project sponsors shall undertake a detailed evaluation of vibration and groundborne noise impacts and identify project-specific mitigation measures as necessary to reduce vibration to a level that complies with applicable local standards or FTA standards. To minimize the effects of vibration and groundborne noise from rail operations, the following measures (or other equally effective measures) shall be implemented where feasible and as applicable based on project- and site-specific considerations:

- Ensure that project sponsors apply the following measures to achieve FTA-recommended vibration levels of 72 VdB at residential land uses, or other applicable standard, for rail extension projects:
  - Use high-resilience (soft) direct fixation fasteners for embedded track.
  - Install ballast mat, or other approved technology for the purpose of reducing vibration, for ballast and tie track.
  - Conduct regular rail maintenance, including rail grinding and wheel truing to recontour wheels, to provide smooth running surfaces.
  - Maximize the distance between tracks and sensitive uses.
  - Implement operational changes, such as limiting train speed and reducing nighttime operations.

Significance after Mitigation

Implementation of Mitigation Measure NOISE-3(a) would reduce vibration impacts by requiring the use of quieter pile-driving technology and ensuring that the proper actions are taken to minimize vibration impacts to adjacent structures. Implementation of the Mitigation Measure NOISE-3(b) would minimize vibration and groundborne noise associated with new and expanded rail systems and operations through vibration control measures for track support (e.g., resilient fasteners, ballast mats) (FTA 2018). To the extent that a lead agency requires an individual project to implement all applicable mitigation measures described above, the impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact NOISE-4: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public-use airport, expose people residing or working in the project area to excessive noise levels (PS)

Land Use Impacts

Public airports typically service entire regions, whereas smaller private airports or airstrips tend to serve local users. However, like other noise sources, noise from airports and aircraft flight events have the greatest effect on nearby land uses. There are 25 public-use airports in the Bay Area that serve commercial and general aviation users (see **Table 3.9-2** and **Figure 3.9-3** in Section 3.9, "Hazards and Wildfire"). Many of the public airports are in urbanized areas where the proposed plan envisions land use development projects. For example, the following airports are located adjacent to the land use growth footprint identified in the proposed plan:

- Oakland International Airport,
- San Francisco International Airport,
- San Jose International Airport,
- Reid-Hillview Municipal Airport (San Jose),
- Moffett Federal Airfield (Mountain View),
- Travis Air Force Base (Fairfield),
- Livermore Municipal Airport, and
- Buchanan Field (Concord).

Most of these airports and airfields have an active ALUCP (or the equivalent) to discourage incompatible land uses within the vicinity of the airport. The FAA Part 150 program encourages airports to prepare noise exposure maps that show land uses that are incompatible with high noise levels, and these are often included in the ALUCP. For example, the ALUCP for San Francisco International Airport includes information on the number of housing opportunity sites within the 70-CNEL contour for airport operations (C/CAG 2012). In addition, noise contours identified in the San Fracisco Bay Oakland International ALUCP indicate that the 65 dBA CNEL is close to existing development (Alameda County 2010: Figure 3-3). Because the locations of new land development are unknown, the potential exists for forecasted development under to the proposed plan to occur in areas of 65 dBA CNEL or 70 dBA CNEL, exceeding recommended airport noise thresholds of 65 dBA CNEL for residential land uses and the project-specific land use compatibility thresholds of 70 dBA CNEL. In addition to increases in exterior CNEL noise levels, increases in interior noise levels near airports have the potential to result in sleep disturbance at nearby sensitive land uses.

To prevent incompatible uses in areas with higher aircraft noise, ALUCPs establish land use policies and criteria (e.g., noise compatibility zones) to limit future incompatible uses in certain areas to minimize noise impacts to people living and working in the ALUCP area. In addition, many local jurisdictions' general plans include land use compatibility standards that designate acceptable levels of noise exposure based on the type of development. Subsequent land use projects would be subject to noise contour standards in each of the ALUCPs, including restrictions identified in the land use compatibility guidelines for each of the region's airports as well as airport noise standards established in the applicable general plan. These standards would preclude the development of sensitive receptors within areas deemed incompatible. The ALUC would identify the land use compatibility standards that apply to the project and determine whether the project is compatible, incompatible subject to specific conditions, or incompatible. However, given the regional scale of the proposed plan and the high level of projected development throughout the region, it is possible that the proposed plan's forecasted development pattern could result in exposure of sensitive receptors to

exterior and interior noise levels from existing airports or airstrips that exceed applicable thresholds. There would be a potentially significant (PS) impact resulting from excessive airport noise levels if projected development were to occur in proximity to existing airports or airstrips that would require mitigation.

Sea Level Rise Adaptation Impacts

The proposed plan includes sea level rise adaptation projects that would include construction of a variety of levees, seawalls, elevated roadways, marsh restoration, and tidal gates. The sea level rise adaptation projects could potentially be located in areas close to existing airports or airstrips, specifically Oakland and San Francisco International Airports; however, they would not consist of habitable structures. Therefore, no sensitive receptors would be exposed to long-term excessive noise levels generated by nearby aircraft, and this impact would be less than significant (LTS).

Transportation System Impacts

There are no airport-related transportation projects identified in the proposed plan. The transportation projects associated with the proposed plan could potentially be located within areas close to existing airports or airstrips; however, they would not consist of habitable structures and are not considered noise-sensitive development. Therefore, no receptors would be exposed to excessive noise levels generated by nearby aircraft, and this impact would be less than significant.

Conclusion

Implementation of the proposed plan's forecasted development pattern could potentially result in new land use development located near existing airports such that sensitive receptors would be exposed to noise levels that exceed applicable exterior and interior noise thresholds. Therefore, this impact would be **potentially significant (PS)**. Mitigation Measure NOISE-4 addresses this impact and is described below.

Mitigation Measures

Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or other equally effective measures:

Mitigation Measure NOISE-4 Local lead agencies for all new development proposed to be located within an existing airport influence zone, as defined by the locally adopted ALUCP or local general plan, shall require a site-specific noise compatibility study. The study shall consider and evaluate existing aircraft noise, based on specific aircraft activity data for the airport in question, and shall include recommendations for site design and building construction to ensure compliance with interior noise levels of 45 dBA CNEL, such that the potential for sleep disturbance is minimized.

Significance after Mitigation

To the extent that a local agency requires an individual project to implement, where applicable, the mitigation measure described above, the appropriate design and building construction would ensure interior noise levels of 45 dBA CNEL, and this impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

3.13 PUBLIC SERVICES AND RECREATION

This section evaluates the potential impacts on schools, police protection, fire protection, emergency medical response, recreation facilities, and other government services (e.g., libraries, prisons, social services) that could result from the implementation of the proposed plan.

No comments related to public services and recreation were received in response to the Notice of Preparation.

3.13.1 Environmental Setting

SCHOOLS

Although the California public school system is under the policy direction of the state legislature, the California Department of Education relies on local control for the management of school districts. School district governing boards and district administrators allocate resources among the schools of the district and set educational priorities for their schools. Each jurisdiction in the nine-county region of the Bay Area provides residents with local public education facilities and services, including elementary, middle, secondary, and postsecondary schools, as well as special and adulteducation.

As of the 2022-2023 school year, there were 1,723 public and charter schools in the Bay Area, with 932,635 enrolled students, and approximately 45,166 full-time equivalent (FTE) teachers. Teachers who work full-time are generally counted as 1.0 FTE, and teachers who work less than full-time are counted by the percentage of time they work (e.g., a half-time position is 0.5 FTE). **Table 3.13-1** lists the number of K-12 public and charter schools within each county.

Table 3.13-1: Bay Area Public Schools and Enrollment by County, 2022-2023

Area[1]	K-12 Schools	K-12 Enrollment	K-12 Full-Time Equivalent Teachers[2]
Alameda County	368	211,930	10,339
Contra Costa County	273	169,225	7,869
Marin County	72	30,483	1,637
Napa County	38	18,625	859
San Francisco County	124	56,501	2,613
San Mateo County	170	84,836	4,414
Santa Clara County	405	236,428	11,292
Solano County	101	60,232	2,839
Sonoma County	172	64,375	3,304
Regional Total	1,723	932,635	45,166

[1] Includes both incorporated cities and unincorporated areas of the county.

[2] Full-time equivalent (FTE) teachers represent teachers with any classroom-based teaching assignment. Administrator, pupil services, and non-classroom-based assignments are not included in these counts. Employees who work full-time are generally counted as 1.0 FTE, and employees who work less than full-time are counted by the percentage of time they work (e.g., a half-time position is 0.5 FTE). Numbers have been rounded to the nearest whole numbers.

Sources: Education Data Partnership 2024; CDE 2024.

EMERGENCY SERVICES

This section provides information on emergency services in the Bay Area, including existing police protection, fire protection, and emergency medical services (e.g., paramedics, emergency medical technicians).

Police Protection

Police services are provided on the state, county, and local levels. Police services provide law enforcement in areas such as crime prevention, traffic and congestion control, safety management, emergency response, and homeland security.

The California Highway Patrol (CHP) is responsible for police protection along the sections of the interstate highway system that traverse the Bay Area. It provides services for the management of traffic, emergency accident response, and protection of the highway system through safety enforcement on interstate roads. CHP services also include various programs and initiatives aimed at improving road safety and awareness for many categories of drivers. Through collaboration with local, state, and federal public safety agencies, its purpose is to minimize exposure of the public to unsafe conditions resulting from emergency accidents and highway impediments (CHP 2025).

Each of the nine counties in the Bay Area has its own sheriff's department responsible for police protection in unincorporated areas of each county. Additionally, each incorporated city and town has a police department responsible for police protection within its own jurisdiction. Unincorporated areas or areas such as transit districts may also contract with county sheriff departments for police services instead of providing their own. Cities and towns may also contract with the county sheriff department to provide law enforcement services.

Police service performances vary by jurisdiction but are typically measured in terms of response times, calculated in the number of minutes it takes a police officer to respond to an incident.

Fire Protection

The Bay Area faces a number of fire threats, including urban, wildland-urban interface, and wildland fires. According to the California Department of Forestry and Fire Protection (CAL FIRE), fire threat in the region ranges from low to extreme depending on factors such as fuel rank, topography, presence of urban development, and expected fire frequency (CAL FIRE 2025). For a detailed discussion of fire hazard risk in the Bay Area, see Section 3.9, "Hazards and Wildfire."

Fire protection services are managed at the local level, typically by municipalities, counties, fire protection districts, or volunteer fire companies. California Government Code Section 38611 states that general law cities must establish a fire department unless it is included within the boundaries of an established fire protection district. State and federal lands are generally served by state and federal fire agencies (e.g., CAL FIRE, National Park Service), and in some cases, businesses and native tribes manage their own fire departments. Each fire protection agency is responsible for serving its own prescribed area, but mutual aid agreements are in wide use across the region such that agencies can rely on assistance from neighboring agencies in the case of overwhelming demand. In an effort to prevent fire-related emergencies altogether, most fire departments and agencies sponsor prevention programs (e.g., public education, vegetation clearance) and enforce fire code regulations in built structures.

Fire protection service performance is typically measured by emergency response times or the ratio of service personnel to service area population. However, because of the varying needs and challenges of each jurisdiction, performance measures differ among agencies, particularly when comparing urban and rural agencies. Fire departments are assigned a Public Protection Classification from the International Organization for Standardization (ISO), a private company that provides information about insurance risk.

To assess fire protection agencies, ISO uses information about emergency dispatch; the number and location of engine companies; the amount of water needed to fight a fire; and local water supply, pressure, and flow. Local fire departments receive a classification from 1 to 10; a classification of 1 is the highest, and a classification of 10 indicates that fire suppression capabilities do not meet ISO's minimum standard.

Emergency Medical Services

Each county of the nine counties in the Bay Area, including incorporated cities and towns within those counties, provides emergency medical services to its residents through the training and certification of paramedics and emergency medical technicians. The various departments charged with administering emergency medical services (e.g., Napa County Emergency Medical Services Agency, San Francisco County Department of Emergency Management) contract with private ambulance services and local fire departments to deploy emergency medical services within their service areas.

LIBRARIES

The San Francisco Bay region is served by several public libraries, including the Alameda Free Library, Alameda County Library, Berkeley Public Library, Contra Costa County Library, Livermore Public Library, Oakland Public Library, Pleasanton Public Library, Richmond Public Library, San Francisco Public Library, and Sonoma County Library. Publicly funded libraries in California are required to maintain a certain amount of local funding depending on the population of a library's service area; however, there are no established standards with which California public libraries must comply (California State Library 2024).

SOCIAL SERVICES

Social services are provided by government agencies, private nonprofit organizations, and private for-profit organizations. The following types of social services are currently available in the proposed plan area:

- **Alcohol, Drug, and Mental Health Services** provide alcohol and drug abuse prevention and treatment services to adults and juveniles and mental health services to seriously mentally ill adults, youths, and families.
- **Adult Education and Job Training** provide educational and job training opportunities to give adult students the knowledge and skills necessary to participate effectively as citizens, employees, parents, and family members.
- **Child Support Services** determine parentage, establish orders for support and medical coverage, and collect and distribute funds from absent parents who have a financial responsibility to support their children.
- **Civic Buildings and Community Centers** include libraries, community centers, and other public buildings not otherwise classified.
- **Courts and Parole Officers** hear and give rulings on the following types of court cases: appeals, civil, criminal, family and children, juvenile, and traffic. Parole officers coordinate parole hearings and supervise defendants not yet sentenced to a term of incarceration and offenders released from incarceration.
- **Health and Disabled Services** provide programs for the medically indigent, older adults, those with disabilities, and detainees; communicable disease prevention and control; protection of food and water; waste and vector control; vital records; nutrition and safety education; and public health nursing services.
- **Homeless and Housing Assistance** provides temporary shelter; food assistance; mental health services; and transitional housing assistance to adults, juveniles, and families.

- **Human Assistance** administers various federal, state, and local government programs designed to provide cash assistance, food stamps, and other social services not otherwise classified.
- **Veteran Affairs** provide medical, mental health, vocational rehabilitation, and employment assistance, educational and other training to veterans.

RECREATION

The Bay Area contains over 1.4 million acres of parks and open space across its nine counties (see **Table 3.13-2**, below, and **Figure 3.11-3** in Section 3.11, "Land Use, Population, and Housing"). However, approximately half of the parks and open space have restricted access or are not available for public use (Bay Area Open Space Council 2025). According to the Bay Area Protected Areas Database compiled by the Bay Area Open Space Council, about 441,551 acres of open space were permanently conserved from 2002 to 2025 (Bay Area Open Space Council 2025). While access by the general public to these reserve areas is restricted, the areas are important for the preservation of wildlife habitats and the protection of the environmental and rural characteristics of various parts of the region.

Table 3.13-2: Acreage of Bay Area Parks and Open Space

Location	Parks and Open Space (acres)[1]
Alameda County[2]	132,900
Contra Costa County[2]	168,600
Marin County[2]	225,100
Napa County[2]	187,200
San Francisco County[2]	5,800
San Mateo County[2]	124,200
Santa Clara County[2]	275,100
Solano County[2]	100,100
Sonoma County[2]	242,700
Regional Total	**1,461,600**

[1] Includes lands that have restricted access or are not accessible to the public. Numbers have been rounded to the nearest 100. Figures may not sum because of independent rounding.

[2] Includes both incorporated cities and unincorporated areas of the county.

Source: Bay Area Open Space Council 2025; compiled by Ascent in 2025.

Parks and open space are generally categorized according to their size and amenities. Smaller parks, such as pocket parks, neighborhood parks, community parks, urban forests, and community gardens, serve local communities, typically are located in urbanized areas, and often include a wide range of improvements from playing fields and picnic areas to playgrounds and fitness trails. These parks are most often managed by local park districts or municipalities, which typically set minimum standards for park acreage based on their population. Larger open space areas, such as regional parks, greenbelts, trails and pathways, natural and wildlife preserves, some private farmlands, some public rangelands, state parks, and federal parks, serve a broader geographic range, typically are located outside of major urbanized areas, and generally include fewer improvements. Management of these parks is divided among a range of organizations and agencies, including regional park districts, state and federal government, private individuals, and nonprofit land trusts.

As noted in Section 3.11, "Land Use, Population, and Housing," the California Coastal Commission and the Bay Conservation and Development Commission (BCDC) regulate land use near the coastline and along the San Francisco Bay, respectively, to protect and enhance the coastline and to promote public

access within the coastal zone of California. On land, the coastal zone varies in width from several hundred feet in highly urbanized areas to up to 5 miles in certain rural areas, and offshore, the coastal zone extends along a 3-mile-wide band of ocean. The coastal zone established by the California Coastal Act does not include San Francisco Bay, where development is regulated by BCDC.

3.13.2 Regulatory Setting

FEDERAL REGULATIONS

Executive Order 12148

Executive Order 12148 was enacted by President Jimmy Carter on July 20, 1979, to merge many of the separate disaster-related responsibilities into the Federal Emergency Management Agency (FEMA). FEMA includes the Federal Insurance Administration, the National Fire Prevention and Control Administration, the National Weather Service Community Preparedness Program, the Federal Preparedness Agency of the General Services Administration, and other emergency-related programs. In March 2003, FEMA joined 22 other federal agencies, programs, and offices to become the US Department of Homeland Security. FEMA's continuing mission within the new department is to lead the effort to prepare the nation for all hazards and effectively manage federal response and recovery efforts following any national incident. FEMA also initiates proactive mitigation activities, trains first responders, and manages the National Flood Insurance Program and the US Fire Administration.

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA 2000) (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for state, local, and Indian tribal governments as a condition of mitigation grant assistance. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for state, local, and Indian tribal entities to closely coordinate mitigation planning and implementation efforts. The requirement for a state mitigation plan is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the state level through the establishment of requirements for two different levels of state plans. DMA 2000 also established a new requirement for local mitigation plans and authorized up to 7 % of Hazard Mitigation Grant Program funds available to a state for development of state, local, and Indian tribal mitigation plans.

US Department of Transportation Act of 1966, Section 4(f) (Amended 2005)

The US Department of Transportation Act (DOT Act) of 1966 included a special provision—Section 4(f)—that stipulated that the Federal Highway Administration and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless:

- there is no feasible and prudent alternative to the use ofland, and
- the action includes all possible planning to minimize harm to the property resulting from use.

The first substantive revision to Section 4(f) since enactment of the DOT Act was made in 2005; it simplified the process and approval of projects that have only minimal impacts on lands protected by Section 4(f). Under the new provisions, once DOT determines that a transportation use of Section 4(f) property results in a minimal impact, analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

Land and Water Conservation Fund Act, Section 6(f)(3)

Section 6(f)(3) of the Land and Water Conservation Fund Act (LWCF Act) of 1965 (16 US Code Section 460l et seq.) contains provisions to protect federal investments in park and recreation resources and the quality of those assisted resources. The law recognizes the likelihood that changes in land use or development may make park use of some areas purchased with LWCF Act funds obsolete over time, particularly in rapidly changing urban areas, and provides for conversion to other use pursuant to certain specific conditions.

Section 6(f)(3) states that no property acquired or developed with assistance under Section 6(f)(3) shall, without the approval of the Secretary of the Department of Interior, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he or she finds it to be in accordance with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he or she deems necessary to ensure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

This requirement applies to all parks and other sites that have been the subject of LWCF Act grants of any type and includes acquisition of parkland and development or rehabilitation of park facilities. If a transportation project would have an effect upon a park or site that has received LWCF Act funds, the requirements of Section 6(f)(3) would apply.

STATE REGULATIONS

California Government Code Section 65995

California Government Code Section 65995 is found in Title 7, Chapter 4.9 of the California Government Code and authorizes school districts to collect impact fees from developers of new residential and commercial/industrial building space. Senate Bill 50, discussed below, amended Government Code Section 65995 in 1998.

Senate Bill 50 (Leroy Greene School Facilities Act of 1998)

The Leroy Greene School Facilities Act of 1998 (Education Code Sections 17070.10–17079.30) eliminated the ability of cities and counties to require full mitigation of school impacts and replaced it with the ability of school districts to assess fees directly to offset the costs associated with increasing school capacity as a result of new development. The act states that payment of developer fees is "deemed to be complete and full mitigation" of the impacts related to planning, new development, or change in government organization relating to educational facilities.

Assembly Bill 2926

In 1986, Assembly Bill No. 2926 (Statutes of 1986, Chapter 887) (AB 2926) authorized the levy of statutory development fees, as well as placed a cap on the number of fees that could be levied, on new residential and commercial/industrial development in order to pay for school facilities. Its overall purpose was to enable school districts to impose developer fees to pay for new school construction (Government Code 53080).

Class Size Reduction Kindergarten-University Public Education Facilities Bond Act of 1998

Proposition 1A, the Class Size Reduction Kindergarten-University Public Education Facilities Bond Act of 1998 (Education Code Sections 100400–100405), is a school construction funding measure that was approved by the voters on the November 3, 1998, ballot. The act created the School Facility Program that allowed eligible school districts to obtain state bond funds for the construction and modernization of educational facilities and accommodate for growth and overcrowding in educational facilities.

California Education Code

School facilities and services in California are subject to the rules and regulations of the California Education Code and governance of the State Board of Education (SBE). SBE is the 11-member governing and policy-making body of the California Department of Education (CDE) that sets K-12 education policy relating to standards, instructional materials, assessment, and accountability. CDE and the state superintendent of public instruction are responsible for enforcing education law and regulations and for continuing to reform and improve public elementary school, secondary school, and childcare programs, as well as adult education and some preschool programs. CDE's mission is to provide a world-class education for all students, from early childhood to adulthood (CDE 2025).

California Emergency Services Act

In 2008, Governor Schwarzenegger signed AB 38, the California Emergency Services Act, which merged the duties, powers, purposes, and responsibilities of the Governor's Office of Emergency Services and the Governor's Office of Homeland Security into a new cabinet-level agency, the California Emergency Management Agency (Cal EMA). In 2013, Governor Edmund G. Brown Jr. merged Cal EMA with the Office of Public Safety Communications and renamed the organization the California Governor's Office of Emergency Services (Cal OES) CAL OES is responsible for overseeing and coordinating emergency preparedness, response, recovery, and homeland security activities within the California. Section 8687.7 of the California Disaster Assistance Act required the development of a Standard Emergency Management System (SEMS) program, for managing multiagency and multijurisdictional responses to emergencies in California. The Cal OES Emergency Management Systems Unit is a multi-agency group charged with methodical review, evaluation, and approval of needed improvements to SEMS. State agencies are required to use SEMS and local government entities must use SEMS in order to be eligible for any reimbursement of response-related costs under the state's disaster assistance programs.

Cal OES serves as the lead state agency for emergency management and coordinates the state response to major emergencies in support of local government. The primary responsibility for emergency management resides with local government. SEMS provides the mechanism by which local government requests assistance from Cal OES, and Cal OES maintains oversight of the state's mutual aid system. Cal OES may task state agencies to perform work outside their day-today and statutory responsibilities and serves as the lead agency for obtaining federal resources.

California Fire Code

Title 24, Part 9 of the CCR is the California Fire Code, which sets forth regulations regarding building standards, fire protection and notification systems, fire protection devices such as fire extinguishers and smoke alarms, high-rise building standards, and fire suppression training. The most recent California Building Standards Code was released in 2022 and became effective on January 1, 2023. The general purpose of the update is principally to update and codify a new edition of the California Building Standards Code (CCR Title 24) that adopts by reference more current editions of the model codes. Development under the proposed plan would be subject to applicable regulations of the California Fire Code.

Title 8 California Code of Regulations Sections 1270 and 6773

In accordance with C.C.R., Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment," the California Occupational Safety and Health Administration (Cal OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

Quimby Act

The 1975 Quimby Act (California Government Code Section 66477) authorized cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. The act states that the dedication requirement of parkland can be a minimum of 3 acres per thousand residents or more and up to 5 acres per thousand residents if the existing ratio is greater than the minimum standard. Revenues generated through in lieu fees collected under the Quimby Act cannot be used for the operation and maintenance of park facilities. In 1982, the act was substantially amended. The amendments further defined acceptable uses of or restrictions on Quimby funds, provided acreage/population standards and formulas for determining the exaction, and indicated that the exactions must be closely tied (nexus) to a project's impacts as identified through studies required by CEQA.

State Open Space Standards

State planning law (Government Code Section 65560) provides a structure for the preservation of open space by requiring every city and county in the state to prepare, adopt, and submit to the Secretary of the Resources Agency a "local open-space plan for the comprehensive and long-range preservation and conservation of open-space land within its jurisdiction." The following open space categories are identified for preservation:

- *open space for public health and safety,* including, but not limited to, areas that require special management or regulation because of hazardous or special conditions;
- *open space for the preservation of natural resources,* including, but not limited to, natural vegetation, fish and wildlife, and water resources;
- *open space for resource management and production,* including, but not limited to, agricultural and mineral resources, forests, rangeland, and areas required for the recharge of groundwater basins;
- *open space for outdoor recreation,* including, but not limited to, parks and recreational facilities, areas that serve as links between major recreation and open space reservations (such as trails, easements, and scenic roadways), and areas of outstanding scenic and cultural value; and
- *open space for the protection of Native American sites,* including, but not limited to, places, features, and objects of historical, cultural, or sacred significance, such as Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines located on public property (further defined in PRC Sections 5097.9 and 5097.993).

State Public Park Preservation Act of 1971

The primary instrument for protecting and preserving parkland is the State Public Park Preservation Act of 1971 (PRC Sections 5400–5409). Under the act, cities and counties may not acquire any real property that is in use as a public park for any nonpark use unless compensation or land, or both, are provided to replace the parkland acquired. This ensures no net loss of parkland and facilities.

McAteer-Petris Act

BCDC is dedicated to the protection and enhancement of San Francisco Bay and the Suisun Marsh and to the encouragement of their responsible use. As the other designated coastal zone management agency, and pursuant to the McAteer-Petris Act, BCDC is designated as the agency responsible for the protection of the bay and its natural resources and for the regulation of the development of the bay and shoreline to their highest potential with a minimum of bay fill. For development projects, including transportation projects, BCDC jurisdiction includes the bay itself (including San Pablo and Suisun Bays, sloughs, and certain creeks) and, in general, a 100-foot band along the bay shoreline.

The McAteer-Petris Act further specifies that certain water-oriented land uses should be permitted on the shoreline, including ports, water-related industries, airports, wildlife refuges, water-oriented recreation and public assembly, desalinization plants, and power plants requiring large amounts of water for cooling purposes. Priority Use Areas (PUAs) designated for such uses in the proposed plan are to be reserved for them to minimize the need for future filling in the bay for such uses. It is necessary to obtain BCDC approval before undertaking any work within 100 feet of the bay shoreline (including grading); filling of the bay or certain tributaries of the bay; dredging; implementing Suisun Marsh projects; performing any filling, new construction, or major remodeling; or otherwise making any substantial change in use, and many land subdivisions in the bay, along the shoreline, in salt ponds, duck hunting preserves, or other managed wetlands adjacent to the bay.

REGIONAL AND LOCAL REGULATIONS

City and County General Plans

State law requires every city and county to adopt a general plan that expresses the community's development goals and embodies public policy relative to the distribution of future land uses, both public and private (LCI 2017). Included in the general plan are potential hazards, policies, and mitigation measures related to recreation, as well as public services and safety. The elements contained in the general plan are intended to promote the highest quality of life in a given jurisdiction.

Each general plan is required to have an open space element that guides the comprehensive and long-range preservation and conservation of "open space land." A wide range of topics are addressed in the open space element, including open space for the preservation of natural resources, open space used for the managed production of resources, open space for outdoor recreation, open space for public health and safety, demands for trail-oriented recreational use, the retention of all publicly owned corridors for future use, and the feasibility of integrating city and county trail routes with appropriate segments of the California Recreational Trails System. Policies and strategies for parks and recreation may include standards for park acreage and requirements for the provision of parks in new residential developments. Senate Bill 1425, which was approved on September 30, 2022, requires each city and county to review and update its local open space plan by January 1, 2026. The local open space plan update must include plans and an action program that addresses specific issues, including climate resilience and other co-benefits of open space.

In addition, each general plan is required to have a conservation element that guides the long-term conservation of natural resources and preservation of open space, including biological resources, water resources, and cultural resources. Assembly Bill 1889, which was approved on September 27, 2024, requires the conservation element of a city or county's general plan to consider the effect of development within the jurisdiction on the movement of wildlife and habitat connectivity.

Each general plan must also include an environmental justice element that addresses the needs of disadvantaged communities. Within the environmental justice element, cities and counties must address access to recreation opportunities through parks and open space for disadvantaged communities (LCI 2020).

Each general plan is also required to have a safety element, which describes plans to promote safety within the jurisdiction, as well as the services available to maintain safety. The purpose of the safety element is to reduce the possible risks related to death, injuries, property damage, and economic and social dislocation resulting from fires, floods, earthquakes, landslides, and other hazards. Included in the safety element is the emergency response section, which describes the service areas of emergency services, including fire, police, and medical, and an evaluation of the adequacy of the existing service and the demand for additional emergency services.

In addition, CCR Section 65302(g) states that a city may adopt a county's safety element "to the extent that the county's safety element is sufficiently detailed and contains appropriate programs and policies for adoption by a city."

General plan policies relating to library services may involve the library level of service, capital facility funding, and library siting. In addition, general plans can evaluate proposed library facilities for consistency with library master plans and explore methods for financing new, expanded, or upgraded library facilities.

Emergency Operations Plans

Local jurisdictions maintain emergency operations plans that detail how emergency and disaster situations are to be handled within that jurisdiction. Jurisdictions may also have Multi-Hazard Emergency Plans that address various threats to the jurisdiction.

Fire District Master Plans

Many jurisdictions and fire districts in the region have adopted or are planning to adopt Fire Department (District) Master Plans. A master plan addresses staffing needs, facility needs, and service goals for the service area and serves as a guiding document for the organization and daily functions of the department.

Recreation and Park Master Plans

Recreation and park master plans outline projected recreation facility needs and strategies for fulfilling those needs. The main purpose of the plans is to provide guidance for addressing preservation, use, development, and administration of recreation facilities. These policy and action documents ensure the preservation of the naturalistic environment while providing developments to facilitate human enjoyment of the parks and recreation areas. Plans can target goals and future actions for a specific park or be generalized to a collection of parks in a larger system.

Regional Shoreline Adaptation Plan

The BCDC Regional Shoreline Adaptation Plan (RSAP) is a guidance document that supports the Bay Area's local governments and communities in addressing the risks of coastal flood hazards through coordinated and consistent adaptation planning and implementation. One of BCDC's primary functions as a coastal zone management agency is to protect, preserve, and increase public access to the bay to the maximum extent feasible. The RSAP identifies the threat of sea level rise to public uses and recreation along the shoreline, including parks, trails, boat launches, marinas, and other public shoreline access points. One of the strategic regional priorities of the RSAP is to provide equitable connected regional shoreline access that balances the need for human enjoyment, sustenance, and cultural connection to the bay with healthy ecosystems (BCDC 2024).

3.13.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- result in substantial adverse physical impacts associated with the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, and other public facilities (Criterion PSR-1) or

- increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment (Criterion PSR-2).

METHOD OF ANALYSIS

This program-level analysis includes a qualitative assessment of impacts related to the need for construction of new or modification/expansion of existing facilities to maintain adequate service ratios, response times, or other performance objective for schools, police and fire protection, emergency medical, other public facilities, and park and recreation services as a result of implementation of the proposed plan. The analysis assesses the amount and location of assumed land uses, sea level rise adaptation projects, and transportation projects under the proposed plan, as compared to existing conditions, and considers how that growth pattern might affect the provision of services as it relates to requiring new or modified/expanded facilities. The baseline for existing services and recreational facilities in the following analysis is the date of Notice of Preparation release in January of 2025. The discussion of projected increases in residents, jobs, and households is based on the data included in Chapter 2, "Project Description," which calculates future growth against a baseline year of 2025. Generally, the analysis in this section is qualitative in nature, addressing generally the types of impacts (not site specific) that could result from construction or modification of facilities needed to meet local service levels. The analysis also considers potential impacts from increased use of existing parks and recreational facilities that could be caused by change in the growth footprint under the proposed plan.

IMPACTS AND MITIGATION MEASURES

Impact PSR-1: Result in substantial adverse physical impacts associated with the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, and other public facilities (PS)

Land Use Impacts

Construction and Operation

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050 the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. The proposed plan designates Growth Geographies and identifies a set of land use approaches to accommodate the projected growth that would result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. The proposed plan was designed to accommodate the people, households, and jobs identified in the regional growth forecast. The overall growth would result in increased demand for services. As the number of households grows, demand for schools and other general government services and facilities (e.g., libraries) would increase. Increases in residential and nonresidential land uses would also increase the number of service calls for emergency services and police and fire protection.

The proposed plan also includes land use strategies that would allow for denser or more compact development in designated Growth Geographies. These strategies would allow greater densities for new commercial development in select Priority Development Areas, Priority Production Areas, and select Transit Rich Areas and provide incentives to employers to shift jobs to housing-rich areas well served by transit. Therefore, service areas for existing service providers may not substantially expand. Implementation of the

proposed plan would result in more dense and intense development than existing conditions, largely as infill development. This type of growth pattern would allow jurisdictions to leverage existing facilities and absorb some of the increased demand more efficiently than if new development were more dispersed.

Overall, with implementation of the plan, the higher density and intensity of new growth in the region, particularly in developed areas, would limit the need to expand service boundaries for law enforcement and fire protection. As a function of distance, these services would not need to expand. However, as a function of response time, plan implementation could result in the need to expand services. As noted in Section 3.9, "Hazards and Wildfire," development that proposes large concentrations of people (such as a job center) or that would site individuals who require special assistance (such as a hospital or senior facility) in an area with identified hazards could cause adverse effects related to the implementation of countywide and jurisdictional emergency plans because there would be more individuals potentially subject to these hazards requiring response from emergency services. As shown in **Table 2-12** in Chapter 2, "Project Description," the increase in population and employment, coupled with limited roadway capacity expansion, would result in an increase in the average trip time of 19%, suggesting an overall increase in congestion. In order to maintain adequate response times, existing emergency service providers may need to expand their capacity and increase their equipment, including ambulances, police cars, fire trucks, and other emergency-related resources (e.g., lifeboats, helicopters) if additional population growth results in substantial increases in the volume of requests for services or a decrease in response times. In cases where future demand exceeds capacity, new facilities may be required. In many cases, particularly police, fire, and emergency medical, adequate service includes consideration of response times, in addition to service ratios.

With respect to increased demand for school-related services, the composition of residential land uses (e.g., single-family residences, multifamily residences) from proposed changes in land use would vary as future development occurs. The generation of additional primary and secondary school-age children and the ability of individual schools to accommodate them is dependent on the type of housing, demographics, and the available capacity of the elementary, middle, and high schools that would accommodate them. This is a dynamic condition that changes over time as population characteristics and other variables change. Therefore, it would be speculative at this time to estimate the number of additional students that would be assigned to individual schools. In cases where increased growth exceeds the capacity of schools and other government-related services and facilities, implementation of the proposed plan could require additional or modified facilities to ensure acceptable levels of service.

At the regional scale, it is not feasible to quantify separate effects on each public service in separate jurisdictions because of the large number of jurisdictions (nine counties, 101 cities) in the plan area and the differing service standards for each service across jurisdictions and lack of site-specific detail for future land use development. Public service standards, performance measures, and policies related to police, fire, emergency protection, and other governmental facilities and services are established by local jurisdictions and agencies. For schools, standards relating to class size are primarily determined by state policy, although local school districts are responsible for the planning and construction of school facilities, and some schools diverge from state policy under overcrowding and scarce funding scenarios.

The following public service standards, performance measures, and related policies are representative of the standards applicable throughout the region:

- **Schools:** School standards related to class size are predominately set at the state level, with school districts also planning for school facilities. Funding for new school construction is provided through state and local revenue sources in the form of development fees. Senate Bill (SB) 50 (1998) governs impact fees from new development for school funding. Payment of fees authorized by this legislation is deemed "full and complete mitigation"; therefore, local agencies cannot require additional mitigation for any school impacts. School impacts fees would be used in combination with state and

other funds to construct new schools. Therefore, SB 50 restricts the ability of local agencies to apply local standards for school impacts, deny project approvals based on school impacts, or require mitigation on the basis that public school facilities are inadequate.

- **Police Protection, Fire Protection, and Emergency Medical Services Response:** Level of service standards for emergency services usually include average response times for service calls and personnel ratios per 1,000 residents. Some individual jurisdictions adopt fire or police master plans that include additional information supporting these goals and policies.
- **Libraries:** Library facilities typically use a service standard of facility feet or acres per capita or per 1,000 residents.
- **Social Services:** Performance measures for social services are subjective, and service standards vary depending on the type of service offered and the jurisdiction where services are provided.

The proposed plan forecasts the general location of future land uses, residential densities, and building intensities in the region through 2025, which extends beyond the horizon year of most local general plans in the plan area. The regional growth forecast could result in increases in demand for public services that exceed existing service capabilities. To meet increased demand for these facilities, existing facilities could require additional personnel and equipment to maintain adequate service levels. In some cases, it would be necessary to construct new facilities or modify existing facilities to maintain adequate capital capacity, equipment, and personnel. Because MTC and ABAG do not have land use authority to adopt local land use plans or approve local land use development projects, future development associated with the land use growth footprint would be ultimately controlled by local jurisdictions throughout the plan area. Future development associated with the land use growth footprint would be required to undergo an evaluation of their contribution to demand on public services prior to approval. In cases where a project would result in increased demand, many jurisdictions require developers to pay impact fees to fund increased demand for public services. However, the amount and extent to which a project must mitigate additional demand would differ on a project-by-project basis depending on size and location and would be the responsibility of the implementing agency/project applicant.

In cases where the proposed plan's forecasted growth pattern would result in the need for new facilities to meet increased demand, short-term construction impacts could occur on a project-by-project basis. For example, the construction of a new school may cause adverse short-term traffic impacts or short-term air quality and noise impacts associated with the use of heavy-duty equipment. If construction occurs on previously undeveloped land, it could have additional impacts including increased stormwater runoff, loss of habitat, effects on cultural/tribal cultural resources, and effects on visual resources. These potential impacts would be evaluated on a project-by-project basis prior to initiating construction activities. Environmental review would be conducted by the appropriate lead agency, and mitigation would be incorporated as needed. For the purposes of this analysis, it is assumed that the construction of new or modified public service facilities resulting from the implementation of the proposed plan could result in adverse environmental effects; however, there is inherent uncertainty surrounding the location and size of future facilities.

Therefore, impacts related to new or expanded school, police, fire, emergency medical, and other government service facilities would be potentially significant (PS). Please see Impact PSR-2 for a discussion of impacts on parks and recreational facilities.

Transportation System and Sea Level Rise Adaptation Impacts

Construction and Operation

Implementation of the proposed plan would include transportation projects that would maintain and optimize the existing transportation system, create healthy and safe streets, and build a next generation

transit network. Sea level rise adaptation projects could result in the construction of levees, sea walls, elevated roadways, marsh restoration projects, and tidal gates. Construction and operation of transportation and sea level rise adaptation projects would not directly result in an increase in residents that would generate new students in the community or new residents that would require new or expanded public service facilities. Further, schools, libraries, parks, and social services would not be needed to support the transportation facilities or sea level rise adaptation projects. Therefore, impacts on public services as a result of transportation and sea level rise adaptation projects in the proposed plan would be less than significant (LTS).

Conclusion

While impacts from sea level rise adaptation and transportation projects are expected to be less than significant, the plan's land use growth footprint to accommodate forecasted regional growth could result in **potentially significant (PS)** impacts related to new or expanded public service facilities. Please see Impact PSR-2 for a discussion of impacts related to parks and recreational facilities. Mitigation Measures PSR-1(a) and PSR-1(b) address this impact and are described below.

Mitigation Measures

Mitigation Measure PSR-1 Implementing agencies and/or project sponsors shall implement the following measure, where feasible and as applicable based on project- and site-specific considerations:

- For projects that could increase demand for public services facilities, implementing agencies and/or project sponsors shall coordinate with relevant service providers to ensure that the existing public services could accommodate the increase in demand. If existing facilities are found to be inadequate to maintain adequate capital capacity, equipment, personnel, and/or response times, facility improvements for the appropriate public service shall be identified in each project's CEQA documentation. Implementing agencies and/or project sponsors shall implement, where feasible and necessary, the mitigation measures described throughout this EIR to address the environmental effects related to the construction of new or expanded public service facilities:
  - Mitigation Measures AES-1 through AES-4
  - Mitigation Measures AGF-1 through AGF-3
  - Mitigation Measures AQ-2 through AQ-4
  - Mitigation Measures BIO-1 through BIO-3 and BIO-5
  - Mitigation Measures GHG-1 and GHG-3
  - Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4
  - Mitigation Measure GEO-7
  - Mitigation Measures HAZ-4, HAZ-6 and HAZ-7
  - Mitigation Measures LU-1and LU-4
  - Mitigation Measures NOISE-1 through Noise-4
  - Mitigation Measures PSR-2
  - Mitigation Measures PUF-1 through PUF-4
  - Mitigation Measure TRA-2

Significance after Mitigation

To the extent that an individual project adopts and implements Mitigation Measure PSR-1 described above, the severity of the impact would be reduced. Mitigation Measure PSR-1 would reduce the severity

of impacts from construction of new or expanded facilities because it would include implementation of measures to offset the impacts of construction of new or physically altered facilities. However, the measures would not reduce this impact to a less-than-significant level, as discussed in the appropriate sections of this EIR. Therefore, this impact would be **significant and unavoidable (SU)**.

Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measure described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measure, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact PSR-2: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment (PS)

Land Use Impacts

Construction and Operation

Currently, the nine-county Bay Area contains nearly 1 million acres of publicly accessible parks and open space containing networks of trails, as well as approximately 7.7 million people, resulting in about 130 acres of public parks and open space per thousand residents. Open space resources, however, are variable and some (such as large open space reserves in Marin, Napa, and San Mateo Counties) serve residents from throughout the region. Smaller parks and playgrounds are intended to serve immediate neighborhoods. Implementation of the proposed plan would increase the number of residents making use of existing parkland and could cause accelerated physical deterioration of parks, trails, and recreational facilities as a result. Most local jurisdictions have their own goals and standards for acceptable amounts of parkland, typically in terms of acres per 1,000 residents (e.g., 5 acres per thousand population) or per capita. Often, park acreage requirements are established with variable amounts dedicated to local parks, regional parks, and regional open spaces. Local jurisdictions strive to ensure that new developments make adequate provisions for new parkland.

The proposed plan's environmental strategies encourage future Bay Area development focused within existing developed areas, ringed by natural lands that are well-maintained and dotted with parks and trails that provide easy access to open space. Support for locally adopted land use policies that limit new construction outside of the existing footprint, combined with investments in natural lands that serve vital ecological purposes and parks and recreation facilities essential to population health and wellbeing are included, with a specific emphasis on improving access to parks and open space and promoting a sustainable development pattern.

The proposed plan includes strategies to protect open space lands and concentrate development within already developed areas. Specifically, Strategy EN4, "Maintain Urban Growth Boundaries" directs new growth to be located within the region's existing urban footprint or growth boundaries. This strategy would confine new development within areas of existing development and areas that are suitable for growth, as established by local jurisdictions. Strategy EN5, "Protect and Manage High-Value Conservation Lands" would provide funds to help protect and conserve high-priority natural and working lands that support recreation opportunities, biodiversity, natural resources, and priority conservation areas. Implementation of Strategies EN4 and EN5 would protect existing recreation resources located within high-priority agricultural and open space lands. Further, Strategy EN6, "Expand Urban Greening in Communities" would expand recreation opportunities through funding quality parks, trails, tree canopy, and urban

greening in communities. Funding for new parks and trails may also be generated at the local level through in-lieu fees collected pursuant to applicable policies and regulations (described above in Section 3.13.2, "Regulatory Setting"). The timing, siting, and project-specific details of individual development projects would dictate the necessity of increasing recreational services in existing service areas or expanding service to new areas. While land use growth could increase demand on recreational services, existing state requirements regarding development of a complete general plan, including Open Space and Conservation Elements, require local jurisdictions to address impacts on recreational facilities. Therefore, the land use growth footprint under the proposed plan would not have a significant impact on recreational resources.

However, implementation of the proposed plan could result in impacts related to the construction or expansion of recreation facilities. As noted above under impact PSR-1, construction may cause adverse short-term traffic impacts or short-term air quality and noise impacts associated with the use of heavy-duty equipment. If construction occurs on previously undeveloped land, it could have additional impacts including increased stormwater runoff, loss of habitat, or damage to cultural/tribal cultural resources. This impact would be potentially significant (PS).

Transportation System and Sea Level Rise Adaptation Impacts

Construction and Operation

Implementation of the proposed plan would include transportation projects that would maintain and optimize the existing transportation system, create healthy and safe streets, and build a next generation transit network. Sea level rise adaptation projects could result in the construction of levees, seawalls, elevated roadways, marsh restoration projects, and tidal gates. Construction and operation of transportation and sea level rise adaptation projects would not contribute to population growth that would generate new residents who would require new or expanded parks or recreation facilities. Further, parks and recreation facilities would not be needed to support the transportation facilities or sea level rise adaptation projects.

However, construction of sea level rise adaptation projects, particularly elevated roadways, levees, and sea walls, would potentially constitute a barrier that would affect the ability of residents to access and utilize regionally important water-oriented uses, such as shoreline parks and trails, water-related recreation, ports, water-related industry, and wildlife refuges along the bay or coast. Implementation of the proposed plan is intended to result in shoreline adaptation that maintains or provides access to shoreline PUAs. The majority of the new sea level rise adaptation footprint would occur within the BCDC shoreline band or the California Coastal Zone, requiring project consistency with the San Francisco Bay Plan (Bay Plan) and applicable Local Coastal Plan adopted policies, respectively. Individual sea level rise adaptation projects would be required to conform to land use restrictions detailed in the Bay Plan or applicable Local Coastal Plan or be consistent with Bay Plan requirements, if applicable, and in particular in relation to maintaining public access.

As noted in Bay Plan Sections 3.11 and 3.13.2, the Bay Plan identifies PUAs, which are reserved for water-oriented land uses, including ports, water-related industries, airports, wildlife refuges, water-oriented recreation and public assembly, desalinization plants, and power plants requiring large amounts of water for cooling purposes. Regionally, the extent of overlap between PUAs and the sea level rise adaptation footprint is approximately 29,000 acres. Individual projects that overlap with PUAs would be required to conform to land use restrictions detailed in the Bay Plan. Generally, implementation of the proposed plan is intended to result in shoreline adaptation that maximizes use of green archetypes and maintains or provides access to shoreline PUAs. In cases where the projected footprint associated with sea level rise adaptation projects overlaps with a PUA, the uses within the PUA must be consistent with Bay Plan requirements. Land use compatibility would be further addressed during subsequent environmental

review as individual projects are implemented and detailed project design or specific plans resolve land use inconsistencies.

Construction activities could create short-term barriers along the shoreline that could result in access closures, detours, and/or project development and staging. For example, access to the bay trail may need to be temporarily disrupted during construction activities. These temporary effects would be minimized with the use of best practices for construction activities, which would be prescribed by the entities described above. With implementation of the sea level rise adaptation projects, access would be improved. In addition, new and expanded capacity roadway projects, bicycle and pedestrian improvements, and increased transit service have the potential to improve access to existing neighborhood and regional parks or other recreational facilities for residents in the region. Therefore, impacts on recreational resources related to transportation and sea level rise adaptation projects would be less than significant (LTS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects have the potential to directly increase demand on recreational services associated with increases in regional growth. Transportation projects could improve access to recreational facilities. These impacts would not be significant because impacts on open space and recreational facilities would be managed at the local level as required by State planning law and existing recreational areas and facilities located within priority conservation areas would not be subject to plan-related development. However, the construction of new or expanded recreational facilities itself may result in significant environmental impacts. Therefore, this impact is **potentially significant (PS)**. Mitigation Measure PSR-2 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure PSR-2 Implementing agencies and/or project sponsors shall implement, where feasible and as applicable, the mitigation measures described throughout this EIR to address the environmental effects related to the construction of new or expanded recreational facilities:

- Mitigation Measures AES-1 through AES-4
- Mitigation Measures AGF-1 through AGF-3
- Mitigation Measures AQ-2 through AQ-4
- Mitigation Measures BIO-1 through BIO-3 and BIO-5
- Mitigation Measures GHG-1 and GHG-3
- Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4
- Mitigation Measure GEO-7
- Mitigation Measures HAZ-4, HAZ-6 and HAZ-7
- Mitigation Measures LU-1 and LU-4
- Mitigation Measures NOISE-1 through Noise-4
- Mitigation Measures PSR-1
- Mitigation Measures PUF-1 through PUF-4
- Mitigation Measure TRA-2

Significance after Mitigation

Implementation of Mitigation Measure PSR-2 would reduce the severity of impacts from construction of new or expanded facilities because it would include implementation of measures to offset the impacts of construction of new or physically altered facilities. However, the measures would not reduce this impact to a less-than-significant level, as discussed in the appropriate sections of this EIR. Therefore, this impact would be **significant and unavoidable (SU)**.

Projects taking advantage of CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measure described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measure, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

3.14 PUBLIC UTILITIES AND FACILITIES

This section describes the environmental setting and assesses the potential for implementation of the proposed plan (to have an impact on public utilities, facilities, and services within the nine counties of the Bay Area. The public utilities, facilities, and services addressed in this EIR are water supply, wastewater (sanitary sewer), stormwater, solid waste, telecommunications, electric power, and natural gas. The analysis is focused on those areas where demand for services may increase as a result of implementation of the proposed plan to accommodate forecasted growth in the region. For a discussion of water quality and flooding, see Section 3.10, "Hydrology and Water Quality."

There were no comments received during the Notice of Preparation scoping process specifically addressing public utilities and facilities.

3.14.1 Environmental Setting

PHYSICAL SETTING

This section describes existing water, wastewater, stormwater, solid waste, telecommunications, electricity, and natural gas providers and infrastructure within the plan area and provides some data regarding existing capacity.

Water Supply

Climatic conditions and annual precipitation are described in Section 3.10, "Hydrology and Water Quality."

San Francisco Bay Hydrologic Region

As defined by the San Francisco Bay Regional Water Quality Control Board (RWQCB), the San Francisco Bay Hydrologic Region (Bay Region) encompasses numerous individual watersheds that drain into the San Francisco Bay and directly into the Pacific Ocean. It covers approximately 4,550 square miles and includes portions of all nine Bay Area counties, as well as Santa Cruz County. Bay Region watersheds are listed in **Table 3.14-1**, and the largest watersheds are depicted in **Figure 3.14-1**.

Table 3.14-1: Watersheds of the San Francisco Bay Hydrologic Region

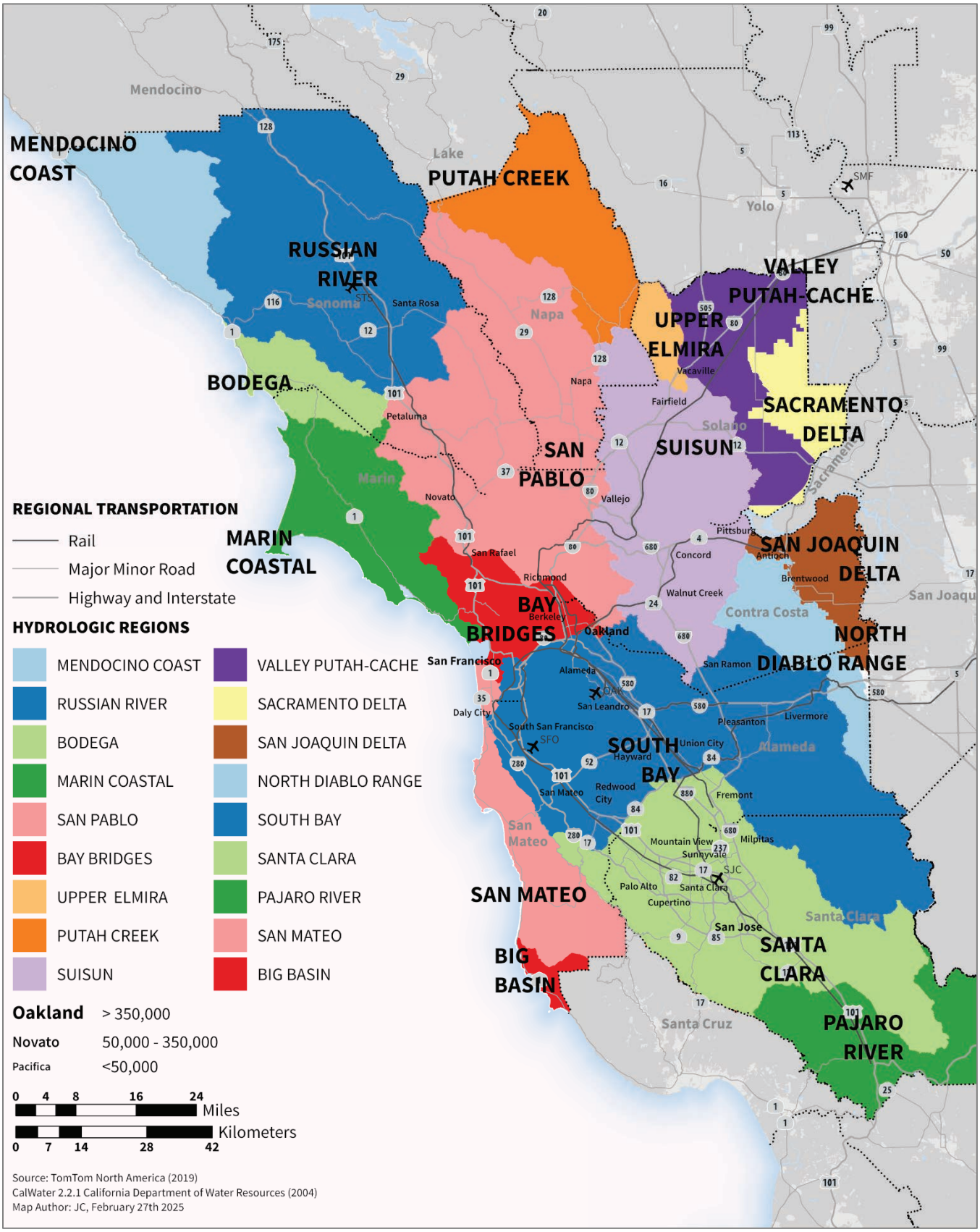
Sub Region	Watershed
North Bay	Mendocino Coast, Russian River, Bodega, Marin Coastal, **San Pablo**, **Bay Bridges**, Upper Elmira, Putah Creek, **Suisun**, Valley Putah-Cache, Sacramento Delta
East Bay	**Bay Bridges**, **San Pablo**, **Suisun**, San Joaquin Delta, North Diablo Range, **South Bay**, **Santa Clara**
South Bay	Santa Clara, South Bay, Pajaro River
West Bay	**Bay Bridges**, San Mateo, **South Bay**, Big Basin

Note: Bold type indicates watersheds that span multiple Bay Area subregions.
Source: DWR 2004; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Water Supply Agencies

Water supply for each county is provided by its respective water supply department or a collection of agencies or companies. Most counties contain several water providers. The focus of this EIR is on a regional analysis of water supply. According to the 2019 San Francisco Bay Integrated Regional Water Management Plan, the agencies and departments included in this description are the major contributors to the water sources in each Bay Area county (SFPUC 2019).

Figure 3.14-1: Major Local Watersheds in the San Francisco Bay Hydrologic Region



Sources: TomTom North America 2019; CalWater 2.2.1 DWR 2024.

Alameda County Water District

The Alameda County Water District (ACWD) serves the Cities of Fremont, Newark, and Union City and the southern portion of the City of Hayward. ACWD is a retail water purveyor that allocates 67% of its water to residential customers and approximately 33% to commercial, industrial, institutional, and large landscape customers. In the 2019-2020 fiscal year, it provided water for a total of 87,323 customers (ACWD 2021). ACWD also manages groundwater through comprehensive programs that protect and improve water supplies. ACWD is the exclusive Groundwater Sustainability Agency for the portion of the Niles Cone Groundwater Basin that underlies ACWD's statutory area.

Bay Area Water Supply & Conservation Agency

The Bay Area Water Supply & Conservation Agency (BAWSCA) was created on May 7, 2003, and represents 27 water suppliers that purchase water from the San Francisco Regional Water System on a wholesale basis and deliver water to people, businesses, and community organizations in San Mateo, Santa Clara, and Alameda Counties. BAWSCA's goals are to ensure a reliable water supply of high-quality water at a fair price for its service area. BAWSCA has the authority to coordinate water conservation, supply, and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes. It should be noted that the other water agencies discussed herein contain members of BAWSCA.

Contra Costa Water District

The Contra Costa Water District (CCWD) provides water to approximately 500,000 people in Contra Costa County, covering a total area of 140,000 acres. It operates and maintains a complex system of water transmission, treatment, and storage facilities to supply both treated and untreated (raw) water to its customers. It provides treated water to approximately 205,000 customers in Clayton, Clyde, Concord, Pacheco, Port Costa and parts of Martinez, Pleasant Hill, and Walnut Creek. In addition, CCWD provides wholesale treated water to the Cities of Antioch and Brentwood and the Golden State Water Company in Bay Point. It also sells untreated water to the Cities of Antioch, Pittsburg, and Martinez and Diablo Water District. CCWD pumps water from four intakes in the Sacramento–San Joaquin Delta (Delta). The intakes are located at Rock Slough, on Old River, on Victoria Canal, and at Mallard Slough. The backbone of the district's water conveyance system is the 48-mile Contra Costa Canal, which starts at Rock Slough and ends at the Martinez Reservoir. In 2020, CCWD served approximately 133,020 acre-feet of water to its customers (CCWD 2021).

East Bay Municipal Utility District

The East Bay Municipal Utility District (EBMUD) serves Alameda, Alamo, Albany, Berkeley, Castro Valley, Crockett, Danville, Diablo, El Cerrito, El Sobrante, Emeryville, Hayward, Hercules, Kensington, Lafayette, Moraga, Oakland, Orinda, Piedmont, Pinole, Pleasant Hill, Richmond, Rodeo, San Leandro, San Lorenzo, San Pablo, San Ramon, Selby, and Walnut Creek. EBMUD's principal water source is the Mokelumne River Basin in the Sierra Nevada. EBMUD has water rights and facilities to divert up to 325 million gallons per day (mgd) from the Mokelumne River, which makes up approximately 90% of the agency's water supply. The other 10% originates as runoff from the watershed lands in the East Bay Area. EBMUD's Mokelumne River facilities include Pardee Dam and Reservoir, located near Valley Springs, and Camanche Dam and Reservoir, located 10 miles downstream of Pardee. Snowmelt from Alpine, Calaveras, and Amador Counties that feeds the upper Mokelumne River is collected in Pardee and Camanche Reservoirs, where it is stored for use by EBMUD. Overall, the basin serves approximately 1.4 million people throughout areas of Alameda and Contra Costa Counties, including services to residential, industrial, commercial, institutional, and irrigation waters (EBMUD 2021).

Marin Municipal Water District

The Marin Municipal Water District (MMWD) serves the populous eastern corridor of Marin from the Golden Gate Bridge northward up to, but not including, Novato, and is bounded by the San Francisco Bay on the east and stretches through the San Geronimo Valley in the west. The incorporated cities and towns of San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere, and Sausalito are within the district's service area. The service area covers approximately 147 square miles, and MMWD serves a population of approximately 190,000 through about 62,000 service connections. MMWD's potable water distribution system includes approximately 886 miles of water mains, 94 pump stations, and 121 treated water storage tanks with a total storage capacity of 74.9 million gallons. Demand for potable and raw water ranged from 23,680 to 29,847 acre-feet of water per year (afy) for the years 2010 through 2019 (MMWD 2021).

City of Napa Water Department

The City of Napa is a major water supply source in Napa County, receiving its annual State Water Project (SWP) entitlement through the Napa County Flood Control and Water Conservation District, which is the contract administrator. The designated water service areas include most of the lower Napa Valley, encompassing all areas within the city limits of the City of Napa and extending up the foothills on the east and west sides of the valley. The city exports water to the Cities of American Canyon, St. Helena, and Calistoga; the Town of Yountville; and the California Veterans Home. The predominant use of land in the area is residential development. In 2020, the population served by the City of Napa Water Department was 86,906. In the City of Napa Urban Water Management Plan the demand is met by supplying water from three major sources: Lake Hennessey, the Milliken Reservoir, and the SWP, as delivered through the North Bay Aqueduct (City of Napa 2022).

San Francisco Public Utilities Commission

The San Francisco Public Utilities Commission (SFPUC) operates the Regional Water System, which provides water to nearly 2.7 million people within San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The Regional Water System consists of more than 280 miles of pipeline and 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. The SFPUC provides water to both retail and wholesale customers (approximately 33% and 67%, respectively) (SFPUC 2021).

The Tuolumne River watershed on the western slope of the central Sierra Nevada, which provides water to the Regional Water System, has three regional water supply and conveyance systems: the Hetch Hetchy System, the Alameda System, and the Peninsula System. The amount of Tuolumne River supplies delivered depends on annual water conditions. In normal years, approximately 85% of SFPUC water supply is provided by runoff from the upper Tuolumne River watershed (SFPUC 2021). This percentage may exceed 90% of SFPUC's supply in dry years, based on the severity and timing of drought conditions. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd, and Lake Eleanor. Water is diverted from the Hetch Hetchy Reservoir into a series of tunnels, aqueducts, and pipelines (the Hetch Hetchy System) that cross the San Joaquin Valley to facilities located in Alameda County (the Alameda System). The Alameda System includes conveyance facilities that connect the Hetch Hetchy System to facilities located in the San Francisco Peninsula (the Peninsula System), which also connects to the City and County of San Francisco's distribution system. This water supply serves customers in San Francisco, as well as 28 wholesale customers located in Alameda, Santa Clara, and San Mateo Counties.

Reservoirs and tanks within San Francisco have the capacity to hold approximately 413 million gallons of water. The SFPUC estimates this capacity to be a 5-day supply at the current average water consumption rate for the city. In addition, there is an emergency supply of existing non-potable water immediately available within the city at Lake Merced, which currently holds approximately 1.9 billion gallons of water. In 2020, the total retail demand for water in the city was 69mgd, and the wholesale purchase requests totaled approximately 132 mgd (SFPUC 2021).

The primary water source for San Mateo County is SFPUC's Regional Water System. In addition to supplies from Hetch Hetchy, the system uses two reservoirs in San Mateo County, Crystal Springs and San Andreas, which collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. Water from the Pilarcitos Reservoir, on Pilarcitos Creek, directly serves one of the wholesale customers, the Coastside County Water District (which serves Half Moon Bay, Miramar, Princeton by the Sea, and El Granada) and can also deliver water to Crystal Springs and San Andreas Reservoirs. San Mateo County wholesale customers of the SFPUC include the Cities of Brisbane, Burlingame, Daly City, East Palo Alto, Menlo Park, Millbrae, San Bruno, and Redwood City; the Town of Hillsborough; the Coastside County Water District; the Cordilleras Mutual Water Association; the Estero Municipal Improvement District; the Guadalupe Valley Municipal Improvement District; the Mid-Peninsula Water District; the North Coast County Water District; and the Westborough Water District. The SFPUC also serves the California Water Service Company Bear Gulch and Bayshore Districts.

Santa Clara Valley Water District

The Santa Clara Valley Water District (SCVWD) is the county's primary water provider, serving Santa Clara County's population of approximately 2 million (SCVWD 2021a). Notably, the SCVWD and SFPUC's wholesale service areas overlap. The SCVWD service area encompasses all the county's 1,300 square miles, and SCVWD serves its 15 cities. Eight retailers in Santa Clara County have contracts with SFPUC to receive water from the SPFUC Regional Water System. The eight retailers, considered to be wholesale customers of SFPUC are the Cities of Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose, and Milpitas; Purissima Hills Water District; and Stanford University. SCVWD does not control or administer SFPUC supplies in the county, but the supply reduces the demands on SCVWD sources of water supply. These eight retailers, however, benefit from the comprehensive water management programs and services provided by SCVWD.

The SCVWD manages groundwater and provides comprehensive water management as authorized by the Santa Clara Valley District Act. SCVWD's water supply system comprises storage, conveyance, recharge, treatment, and distribution facilities that include 10 local reservoirs, the groundwater basin, groundwater recharge facilities, treatment plants, imported supply, and raw treated water conveyance facilities. The primary source of water for SCVWD is groundwater and surface water stored in the reservoirs. The reservoirs store up to 25% of Santa Clara County's water supply. The capacity of all the local reservoirs of SCVWD is 169,140 acre-feet, with 63,362 acre-feet of restricted capacity (SCVWD 2021a).

About half of the county's water supply currently comes from local sources, and about half comes from imported water sources. Groundwater pumping provides up to half of the county's water supply during normal years. SCVWD uses conjunctive use methods—the practice of storing surface water in a groundwater basin in wet years and withdrawing from the basin in the dry years—to ensure proper protection of groundwater aquifers in Santa Clara County. SCVWD manages two groundwater subbasins that transmit, filter, and store water: the Santa Clara Subbasin and the Llagas Subbasin. Santa Clara County also imports water supplies from the Delta through three main pipelines: the South Bay Aqueduct, which carries water from the SWP, and the Santa Clara Conduit and Pacheco Conduit, both of which bring water from the federal Central Valley Project (CVP). SCVWD is contracted to import 152,500 afy and 100,000 afy from the CVP and SWP, respectively (SCVWD 2021a).

Solano County Water Agency

The Solano County Water Agency (SCWA) is a wholesale water agency that provides untreated water to cities and agricultural districts in Solano County and parts of Yolo County from the federal Solano Project and the North Bay Aqueduct of the SWP. SCWA's service area population in 2020 was approximately 440,000 (SCWA 2023). It has water contracts to deliver water to Fairfield; Suisun City; Vacaville; Vallejo; Solano Irrigation District; Maine Prairie Water District; the University of California, Davis; and the California State Prison in Solano. The SWP has rights to water originating from the Sacramento and San

Joaquin Rivers, and it stores water on Lake Oroville on the Feather River. The SWP provides water to the SCWA through the North Bay Aqueduct, a 27-mile-long pipeline that delivers untreated municipal water from Barker Slough in the Delta to Napa and Solano Counties.

The major facilities of the Solano Project are the Monticello Dam, which captures water from Putah Creek in Lake Berryessa; the Putah Diversion Dam, which diverts water out of lower Putah Creek; and the Putah South Canal, which delivers water to local agencies. The Putah South Canal is 33 miles long.

SCWA has contracted with the California Department of Water Resources (DWR) for an ultimate allocation of 47,756 afy from the SWP. In 2015, SCWA delivered a total of 206,030 acre-feet of water to its respective agencies (SCWA 2016).

Sonoma Water

Sonoma Water is a water wholesaler that provides drinking water to nine cities and special districts and to more than 630,000 residents in portions of Sonoma and Marin Counties. The primary water source for Sonoma Water is the Russian River. The Russian River originates in central Mendocino County and discharges into the Pacific Ocean near Jenner, about 20 miles west of Santa Rosa, and it is approximately 110 miles in length. Additionally, the Santa Rosa Plain provides groundwater. Groundwater is an important source of water in Sonoma County because it provides the domestic water supply for most of the unincorporated portion of the county and is a primary source of water for agricultural users. Three water agency wells located along the Russian River- Cotati Intertie Pipeline in the Santa Rosa Plain also provide a portion of the agency's water supply. Sonoma Water diverts water from the Russian River and delivers it to customers through a transmission system. The transmission system consists of six radial collector wells at the Wohler and Mirabel production facilities adjacent to the Russian River. In 2020, Sonoma Water provided approximately 51,000 afy to its customers and contractors (including surplus and non-surplus customers) (Sonoma Water 2021).

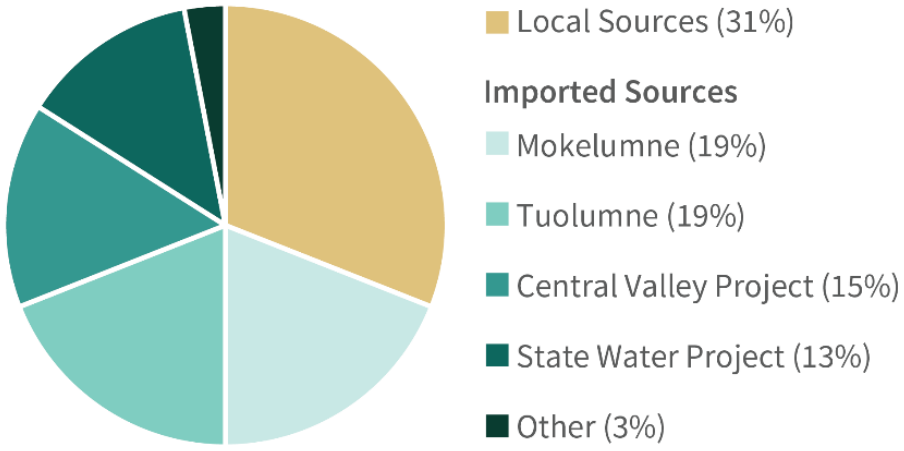
Zone 7 Water Agency

The Zone 7 Water Agency (Zone 7) water service area, located about 40 miles southeast of San Francisco, encompasses an area of approximately 425 square miles of the eastern portion of Alameda County, including the Livermore-Amador Valley, Sunol Valley, and portions of the Diablo Range. The Zone 7 service area also overlies the Alameda Creek watershed. This watershed encompasses almost 700 square miles and extends from Altamont Pass to the east, San Francisco Bay to the west, Mount Diablo to the north, and Mount Hamilton to the south. Zone 7 is the water wholesaler for the Livermore-Amador Valley, as well as the area's flood control agency. It supplies untreated water for agriculture and treated drinking water to the California Water Service Company, Dublin San Ramon Services District, the City of Livermore, and the City of Pleasanton (Zone 7 Water Agency 2021).

Water Supply Sources

To service the region's residential, commercial, and agricultural water needs, Bay Area water agencies must manage diverse water supplies. These include supplies from local and imported sources, as well as through methods such as desalination and the use of recycled water. **Figure 3.14-2** shows the breakdown of typical Bay Area water use by source of supply.

Figure 3.14-2: Bay Area Water Use by Supply Source



Source: SFPUC 2019.

Local Water

Local water supplies come from two interconnected sources: surface water and groundwater. Surface water is water that collects above ground in a stream, river, lake, reservoir, wetland, or ocean. Groundwater is water that has infiltrated into the subsurface that completely fills (saturates) the void space of rocks or sediment. They are physically connected in the hydrologic cycle when, at certain locations or times of the year, water infiltrates the bed of a stream to recharge groundwater or, at others, groundwater discharges, contributing to the base flow of a stream.

A long-term threat to groundwater sources is overdraft. Overdraft is the condition of a groundwater basin in which the amount of water withdrawn by pumping over the long term exceeds the amount of water that recharges the basin. Overdraft is characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years. Overdraft can lead to increased extraction costs, land subsidence, water quality degradation, and environmental impacts. Although the Bay Region was not identified in DWR's last statewide report on groundwater sources in 2020 as an area that is at short-term risk for widespread overdraft conditions (DWR 2021), many strategies identified in the *Bay Area Integrated Regional Water Management Plan* seek to reduce the likelihood of overdraft (SFPUC 2019).

Together, surface water and groundwater currently supply approximately 31% of Bay Area water (SFPUC 2019). Surface water from local rivers and streams (including the Delta) is an important source for all Bay Area water agencies but particularly so in the North Bay counties, where access to imported water is more limited because of infrastructure limitations. The Bay Area has 28 identified groundwater basins, which underlie approximately 30% of the region (see **Figure 3.14-3**). The basins that are most intensively used for water supply are the Santa Clara Valley, Napa-Sonoma Valley, Petaluma Valley, Livermore Valley, and Westside (on San Francisco Peninsula) basins (SFPUC 2019). Groundwater is also an important local supply source for ACWD, BAWSCA member agencies, SCVWD, SFPUC, and Sonoma Water.

Imported Water

The greatest proportion of Bay Area water is imported from Sierra Nevada and Delta sources, which make up approximately 66% of supply (Bay Area IRWMP 2019). As described for SFPUC and EBMUD above, the primary Sierra Nevada sources are the Mokelumne River and Tuolumne River watersheds. Several Bay Area water agencies receive Delta water through the SWP and CVP, which have a vast network of canals and aqueducts for the delivery of water throughout the Bay Area and the Central Valley. Major water conveyance infrastructure delivering water through the SWP and CVP is described in the "Water Supply Infrastructure" section, below.

Figure 3.14-3: Bay Area Groundwater Basins



Sources: TomTom North America 2019; DWR 2024.

Recycled Water

In the 1990s, a number of local agencies joined with DWR and the US Bureau of Reclamation to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. This cooperative effort, known as the Bay Area Regional Water Recycling Program, produced a master plan for regional water recycling in 1999 for the five counties south of the bay. Since then, local water agencies have built a number of projects consistent with the program, and recycled water has come to be widely used in the Bay Area for a number of applications, including landscape irrigation, agricultural needs, commercial and industrial purposes, and as a supply to the area's wetlands. A similar effort for North Bay counties was organized by the North Bay Regional Water Recycling Feasibility Study and Program. Together, these planning efforts have resulted in over 30 agencies in the region developing recycled water programs. In 2015, the Bay Area recycled 58,000 afy, almost 10% of the wastewater effluent generated, and supply is expected to more than double over the next 20 years (SFPUC 2019).

Desalination

Bay Area agencies have explored desalination as an alternative source of drinking water. In 2003, a number of water agencies formed the Northern California Salinity Coalition to formally join together to research and identify regional approaches for addressing salinity impacts, as well as the use and application of desalination (BARDP n.d.). In 2005–2006, MMWD operated a desalination pilot plant, enabling it to conduct environmental studies, test equipment, refine operating costs, and demonstrate the technology to MMWD customers. The agency used the results of the pilot plant operations to refine the design requirements and costs of a full-scale desalination facility. This project is not currently being pursued; other measures like water efficiency, recycled water, and interties are being pursued to increase water reliability with lower costs.

In 2003, ACWD opened the Newark Desalination Facility, the first brackish water desalination facility in northern California, with a capacity of 5 mgd, and it doubled the production to 10 mgd for a total blended production of 12.5 mgd to the distribution system. Eight water agencies in the Bay Area (ACWD, BAWSCA, CCWD, EBMUD, MMWD, SFPUC, SCVWD, and Zone 7 Water Agency) are working together to investigate opportunities for collaboration. The purpose of this planning effort, known as Bay Area Regional Reliability (BARR), is to identify projects and processes to enhance water supply reliability across the region, leverage existing infrastructure investments, facilitate water transfers during critical shortages, and improve climate change resiliency. Projects to be considered will include interagency interties and pipelines, treatment plan improvements and expansion, groundwater management and recharge, potable reuse, desalination, and water transfers. While no specific capacity or supply has been identified, this program may result in additional future supplies that would benefit Bay Area Customers (Brown and Caldwell 2017).

In October 2023, SCVWD completed a preliminary environmental feasibility study for the development of a possible desalination project in Santa Clara County. The study indicated that a desalination facility in Santa Clara County may be feasible provided certain environmental issues are addressed, including the protection of sensitive habitats in the South San Francisco Bay. The second phase of the feasibility study is currently underway and will evaluate the technical feasibility, costs, and regulatory permitting requirements of the possible desalination project (SCVWD 2024).

Water Transfers

Water transfers allow suppliers with excess water supplies to sell their water to those agencies in need. In addition, agriculture-to-urban transfers can allow agricultural districts with marginal lands to be fallowed (taken out of production). Water transfers also provide reduced vulnerability to water shortages resulting from drought, catastrophic events, and system security breaches. Several Bay Area regional water agencies, including ACWD, CCWD, EBMUD, SCVWD, SFPUC, Solano CWA, and Zone 7, have

participated in various types of water transfers to supplement their existing water supplies. Historic and existing water transfer arrangements occurring in the region include, but are not limited to, the following:

- **CCWD Long-Term and Short-Term Water Transfers**. CCWD has long-term agreements that enable it to purchase up to 12,200 acre-feet per year (AFY) from East Contra Costa Irrigation District (ECCID) during droughts (CCWD 2021).
- **SFPUC Water Transfers**. The SFPUC participated in the DWR Drought Bank to help meet demands during the 1987–1992 drought and has also purchased water from the Kern County Water Bank. SFPUC is engaging in discussions with partners to explore potential dry-year transfer opportunities on the Tuolumne River and throughout the San Joaquin Valley (SFPUC 2024).
- **SCVWD Short-Term Water Transfers**. SCVWD participates in water transfers and exchanges on a routine basis. For example, in 2003 when CVP and SWP allocations initially were low, SCVWD purchased 28,000 acre-feet through six separate transactions.

In 2014, the BARR partnership developed a drought contingency plan and have since begun work on a Bay Area Shared Water Access Program (SWAP). The purpose of SWAP is to help guide future transfers and exchanges to address urgent supply shortfalls in times of need. In March 2023, participating BARR partners completed a Strategy Report that provides guidance and serves as a resource to assist BARR partners and other water managers when planning future water transfers and exchanges (BARR 2023).

Water Conservation

Reducing water demand through conservation is a key component of improving water supply reliability in the Bay Area. All of the 11 major water agencies in the region are members of the California Water Efficiency Partnership, formally known as the California Urban Water Conservation Council, which promotes the development and implementation of conservation best management practices (BMPs), such as metering, public information programs, conservation pricing, and washing machine rebates. Many local water agencies are also implementing conservation projects and programs that extend beyond these baseline BMPs.

Water Supply Infrastructure

As noted above, approximately two-thirds of the water used by Bay Area water agencies comes from nonlocal sources. The Mokelumne, Tuolumne, San Joaquin (CVP), and Sacramento (SWP) Rivers all flow from out of region mountain ranges through the Delta. As a result, the region relies on a diverse network of water infrastructure, including the following aqueducts and storage facilities to convey supplies to its residents (SFPUC 2019):

- **Contra Costa Canal**. Originally constructed to serve agricultural needs, the Contra Costa Canal is now the backbone of the CCWD transmission system. The canal spans 48 miles, conveying water from the Delta to CCWD's treatment facilities and raw water customers.
- Hetch Hetchy provides water to 2.6 million
- **Mokelumne Aqueducts**. The three aqueducts that make up the Mokelumne Aqueduct System convey most of EBMUD's supply 87 miles, from Pardee Reservoir on the Mokelumne River to Walnut Creek.
- **North Bay Aqueduct**. The North Bay Aqueduct is an underground pipeline operated remotely by DWR. It extends from the Delta to Benicia, Vallejo, and Napa County. SCWA and the Napa County Flood Control Water and Conservation District, which includes the City of Napa as a member agency, receive Delta supplies through the North Bay Aqueduct.
- **Russian River Transmission Facilities**. Sonoma Water operates diversion facilities at the Russian River and an aqueduct system composed of pipelines, pumps, and storage tanks.

- **San Felipe Division**. A set of pipelines and pumps convey CVP water from San Luis Reservoir to Santa Clara and San Benito Counties. In Santa Clara County, the San Felipe Division terminates at Coyote Pumping Plant, where it connects with SCVWD's Cross-Valley Pipeline.
- **South Bay Aqueduct**. The South Bay Aqueduct conveys water from the Delta through over 40 miles of pipelines and canals. ACWD, Zone 7, and SCVWD receive SWP supplies conveyed through the South Bay Aqueduct.

In addition to pipelines and aqueducts, each Bay Area water agency has its own extensive network of surface water storage reservoirs, groundwater extraction wells, water treatment plants, and distribution pipelines.

Regional Demographics and Water Demand

Numerous factors influence water demand, including employment growth, socioeconomic characteristics, geographic distribution of the population, variation in local precipitation levels, and water conservation practices. Although the Bay Area's population grew steadily for several decades, recent estimates indicate a slight downward population trend since 2020, largely driven by out-migration and other factors (DOF 2023). Despite this recent decline, many water agencies project that long-term population in the region will either stabilize or gradually rebound and thus continue to influence water demand in the coming years (MMWD 2021; SFPUC 2021; EBMUD 2021).

Table 3.14-2 shows the projected water supplies and demands from the most recent urban water management plans (UWMPs) for normal years in the near future (2025) and over the next 20 years (2045). All the water districts, except for SCWA, will be able to provide adequate water supplies to meet projected demand in a year of normal precipitation, although doing so would require some districts to acquire additional supplies. It is possible that demand in the SCWA could exceed the county's supply, which would require the county to acquire additional sources from other counties in the region or elsewhere.

Table 3.14-2: Projected Normal Year Supply and Demand (Acre Feet/Year)

Agency	2025 Supply	2025 Demand	2045 Supply	2045 Demand
Alameda County Water District	68,200	60,900	68,200	67,500
Contra Costa Water District[1]	307,800	238,900	350,700	283,000
East Bay Municipal Utility District	208,500	208,500	234,300	234,300
Marin Municipal Water District	84,800	38,000	84,900	38,200
City of Napa	31,700	15,100	28,900	16,700
San Francisco Public Utilities Commission[1, 2]	242,900	242,900	272,800	272,800
Santa Clara Valley Water District	446,000	330,000	650,000	345,000
Solano County Water Agency[1]	244,000	255,000	Not available	Not available
Sonoma Water	65,000	65,000	74,500	74,500
Zone 7 Water Agency	76,700	50,300	83,200	55,300

Note: Numbers have been rounded to the nearest 100.

[1] Projected supply and demand include retail and wholesale customers (in SFPUC's case, including Bay Area Water Supply & Conservation Agency member agencies).

Sources: ACWD 2021; CCWD 2021; EBMUD 2021; MMWD 2021; City of Napa 2022; SFPUC 2021; SCVWD 2021a; SCWA 2016; Sonoma Water 2021; Zone 7 Water Agency 2021; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Some Bay Area water agencies are projecting future water supply shortfalls in dry years, and some are already seeing such shortfalls, as shown in **Table 3.14-3**. Other agencies anticipate being able to handle a single dry year, largely because of reservoirs or other storage capacity. The severity and timing of dry year shortfalls differ greatly among the agencies because of the wide variation of supply sources, types of use, and climates within the region.

Table 3.14-3: Year of Projected Water Shortages (Single Dry Year)

Agency	First year in which demand is expected to outpace supply during single dry years	First year in which demand is expected to outpace supply during multiple dry years
Alameda County Water District	2020	2023
Contra Costa Water District	none	none
East Bay Municipal Utility District	none	2030
Marin Municipal Water District	none	none
City of Napa Water Department[2]	2040	2035
San Francisco Public Utilities Commission	2025	2025
Santa Clara Valley Water District	none	none
Solano County Water Agency	2015	2015
Sonoma Water	2030	none
Zone 7 Water Agency[2]	none	none

Sources: ACWD 2021; CCWD 2021; EBMUD 2021; MMWD 2021; City of Napa 2022; SFPUC 2021; SCVWD 2021a; SCWA 2016; Sonoma Water 2021; Zone 7 Water Agency 2021; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025. in 2025.

Drought

California has experienced several prolonged droughts, specifically (in recent times) in 1973, 1976 through 1977, 1987 through 1991, 2007 through 2009, and 2011 through 2016. During the most recent drought, the governor declared a state of emergency, calling on all Californians to reduce their water usage by 20% characterizing it as the driest five years on record for the state (State of California 2014). The 2011–2017 drought eased in the winter of 2017, as many parts of California saw dramatically improved hydrologic conditions, with the governor lifting the Drought emergency with major state reservoirs above normal storage levels (State of California 2017).

On February 13, 2023, Governor Newsom signed Executive Order (EO) N-3-23 regarding water use and supply conditions in California. EO N-3-23 aims to enhance water supply resilience in California by: 1) directing the State Water Resources Control Board (SWRCB) to consider modifications to State Water Project and Central Valley Project water right permit conditions in order to enable additional water storage; 2) suspending compliance with CEQA for such approvals; and 3) continuing the Governor's CEQA exemption for groundwater recharge projects to the extent necessary to address drought impacts. Governor Newsom signed EO N-4-23 on March 10, 2023. EO N-4-23 sets forth the conditions under which water users may capture and divert floodwater for groundwater recharge. On March 3, 2023, Governor Newsom signed EO N-5-23, which modified the 2022 drought EO N-7-22. Modifications include ending the voluntary 15% water conservation target, ending the requirements that local water agencies implement level 2 of their drought contingency plans, maintaining the ban on wasteful water uses, preserving all current emergency orders focused on groundwater supply, and maintaining orders focused on specific watersheds that have not benefited as much from recent rain events. EO N-5-23 also retains a state of emergency for all 58 counties to allow for drought response and recovery efforts to continue.

Climate change is expected to increase the number and severity of future droughts (SCVWD 2021b). For this reason, the state has continued to pursue making water conservation a California way of life, passing

further legislation in 2018 to develop new standards for indoor and outdoor residential use, commercial, industrial, and institutional water use for landscape irrigation, and water loss (SWRCB 2021).

As of March of 2025, drought conditions ranging from moderate to extreme are present in approximately 42% of the state. The nine counties in the Bay Area are currently experiencing abnormally dry conditions (USDM 2025). According to the US Drought Monitor classification system, "abnormally dry" indicates short-term dryness that may precede drought, potentially signaling higher risk if below-average precipitation persists. In addition to the abnormally dry conditions within the boundaries of the nine counties, shortages in precipitation in the Sierra Nevada can have pronounced effects on water supply in the Bay Area because of the reliance of the region of water from the Tuolumne and Mokelumne River watersheds, as well as the SWP and CVP, which rely on out-of-region watersheds.

Wastewater Treatment

Wastewater is generated by residential, commercial, and industrial sources throughout the Bay Area. Treatment of wastewater provides protection for human health and receiving water bodies, preservation of the health of aquatic and riparian species, and improved supply reliability through the removal of harmful pollutants from discharges.

Urbanized and unincorporated areas of cities and counties throughout the Bay Area provide wastewater treatment facilities. These facilities include systems made up of pipelines, pump stations, interceptor stations and discharge stations. Treatment plants send wastewater through up to three treatment processes (primary, secondary, tertiary) depending on treatment requirements established by the pertinent RWQCB for the particular plant. The level of treatment is often dictated by where treated effluent is discharged (land, water body) and if there is an end use that requires higher treatment levels (recycling). Many of the Bay Area's wastewater treatment plants include primary and secondary treatment for wastewater, as well as recycled water programs that require tertiary treatment. In many cases, secondary effluent is discharged into the San Francisco Bay, and wastewater from Solano County is pumped into the Delta. Wastewater is also recycled for other uses, such as agriculture, irrigation, or landscaping. Treatment requirements are promulgated by the RWQCB and are typically reviewed, along with treatment capacity, every 5 years. As a result of this process, planning and upgrading of treatment plants is an ongoing process for each plant.

Wastewater treatment in the Bay Area is provided by various agencies, as well as individual city and town wastewater treatment systems. Bay Area wastewater treatment facilities are listed in **Table 3.14-4**. Some treatment plants serve individual cities, while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Each plant is typically sized to accommodate growth over a 15- to 20-year horizon. Because of the dynamic nature of treatment plant planning/upgrading/expansion, it is not practical, at this regional and programmatic level of analysis, to characterize treatment plant technology, flows, and capacity.

Table 3.14-4: Wastewater Treatment Facilities in the Region

Treatment Agency	Service Area
Alameda County	
City of Hayward	City of Hayward
City of Livermore	City of Livermore and surrounding unincorporated areas
City of San Leandro, Environmental Services Division	City of San Leandro
Dublin San Ramon Services District	Cities of Pleasanton and Dublin
East Bay Municipal Utility District	Cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont

Treatment Agency	Service Area
Oro Loma Sanitary District	City of San Leandro, City of Hayward and unincorporated areas San Lorenzo, Ashland, Cherryland, Fairview, and portions of Castro Valley
Union Sanitary District	Cities of Fremont, Newark, and Union City
Contra Costa County	
Central Contra Costa Sanitary District	Cities of Clayton, Concord, Lafayette, Orinda, Pleasant Hill, San Ramon, Walnut Creek, Towns of Danville, Moraga, and unincorporated area of Alamo
City of Brentwood	City of Brentwood
City of Hercules / City of Pinole	City of Hercules
City of Richmond Municipal Services District	City of Richmond
Crockett-Valona Sanitary District	Unincorporated area of Crockett
Delta Diablo Sanitation District	Cities of Antioch, Pittsburg, and unincorporated Bay Point area
East Bay Municipal Utility District	Cities of El Cerrito, Richmond, and unincorporated Kensington
Ironhorse Sanitary District	City of Oakley and unincorporated area of Bethel Island
Mt. View Sanitary Eastern District	City of Martinez and surrounding unincorporated areas
Rodeo Sanitary District	Unincorporated Rodeo area
West County Wastewater District	City of Richmond and unincorporated El Sobrante area
Marin County	
Central Marin Sanitation Agency	Service areas of Sanitary District No. 2, San Rafael Sanitation District, Ross Valley Sanitary District
Las Gallinas Valley Sanitary District	City of San Rafael and surrounding unincorporated areas
Marin County Sanitary District #5	Town of Tiburon
Novato Sanitary District	City of Novato and unincorporated Bel Marin, Ignacio and Hamilton areas
Ross Valley Sanitation District	City of Larkspur, Town of San Anselmo, and surrounding unincorporated areas
Sausalito Marin City Sanitary District	City of Sausalito and unincorporated Marin City area
Sewerage Agency of Southern Marin	City of Mill Valley and surrounding unincorporated areas
Napa County	
City of American Canyon	City of American Canyon
City of Calistoga	City of Calistoga
City of St. Helena	City of St. Helena
Napa Sanitation District	City of Napa and unincorporated surrounding areas
Town of Yountville	Town of Yountville
San Francisco	
San Francisco Public Utilities Commission	City and County of San Francisco
San Mateo County	
City of Burlingame	City of Burlingame, Town of Hillsborough and unincorporated Burlingame Hills area
City of Millbrae	City of Millbrae
City of Pacifica	City of Pacifica
City of San Mateo/ Estero Municipal Improvement District	Cities of San Mateo and Foster City

Treatment Agency	Service Area
Cities of South San Francisco and San Bruno	Cities of South San Francisco, San Bruno, Daly City and Millbrae and Town of Colma
North San Mateo County Sanitation District	Cities of Daly City and South San Francisco
Sewer Authority Mid- Coastside	City of Half Moon Bay and unincorporated Granada, Moss Beach and Montero areas
San Francisco Public Utilities Commission	Cities of Brisbane and Daly City
Silicon Valley Clean Water	Cities of Belmont, San Carlos, Redwood City, Menlo Park and Towns of Atherton, Portola Valley, Woodside
Santa Clara County	
City of Sunnyvale Water Pollution Control Plant	City of Sunnyvale
Palo Alto Regional Water Quality Control Plant	Cities of East Palo Alto, Los Altos, Mountain View, Palo Alto, Town of Los Altos Hills and unincorporated Stanford University area
San Jose/ Santa Clara County Water Pollution Control Plant	Cities of San Jose, Campbell, Saratoga, Monte Sereno, Cupertino, Milpitas and Town of Los Gatos
South County Regional Waste Water Authority	Cities of Morgan Hill and Gilroy
Solano County	
City of Benicia	City of Benicia
City of Dixon	City of Dixon
City of Rio Vista	City of Rio Vista
City of Vacaville	City of Vacaville
Fairfield-Suisun Sewer District	Cities of Fairfield and Suisun City
Vallejo Sanitation and Flood Control District	City of Vallejo
Sonoma County	
City of Cloverdale	City of Cloverdale
City of Petaluma	City of Petaluma and unincorporated Pengrove area
Sonoma Valley County Sanitation District	Areas covered by Airport/Larkfield/Wikiup Sanitation Zone, Geyserville Sanitation Zone, Penngrove Sanitation Zone, Occidental County Sanitation District, Russian River County Sanitation District, Sonoma Valley County Sanitation District, South Park County Sanitation District
Santa Rosa Water	Cities of Santa Rosa, Rohnert Park, Sebastopol, Cotati, and surrounding unincorporated areas
Town of Windsor	Town of Windsor
Occidental County Sanitation District	Unincorporated Occidental area
Russian River County Sanitation District	Unincorporated Sonoma County
South Park County Sanitation District	Unincorporated Sonoma County
Airport/Larkfield/Wikiup Sanitation District	Unincorporated Larkfield and Wikiup area
Geyserville Sanitation Zone	Unincorporated Geyserville area

Source: ABAG 2016; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Note: New or revised information for Central Marin Sanitation Agency, Sonoma Valley County Sanitation District, Occidental County Sanitation District, and other recently added facilities is derived from:

- Central Marin Sanitation Agency. 2021. 2020 UWMP.
- Sonoma Water. 2022. Municipal Service Review (July 2022).
- Regional Water Quality Control Board permits (various dates).
- Graton Community Services District. 2020 Annual Report.

Stormwater Treatment

Stormwater has been identified as urban runoff by the US Environmental Protection Agency (EPA). After a precipitation event, polluted runoff is discharged over land or through storm sewer systems, often untreated with direct flow into water bodies. If left uncontrolled, this polluted water can result in the destruction of wildlife and aquatic ecosystems and can threaten public health. The National Pollutant Discharge Elimination System (NPDES) permitting program provides implementation measures for reducing potentially harmful pollutants found in stormwater runoff from entering water bodies or affecting public health. Additionally, stormwater capture systems assist in maintaining flood protection and create opportunities for ecosystem protection and restoration.

The Bay Area regulates stormwater at the regional, county, and city level. In the early 1990s, the RWQCB issued countywide municipal stormwater permits to operators of municipal separate storm sewer systems (MS4s) serving populations over 100,000. Subsequently, in 2015, the RWQCB reissued these countywide municipal stormwater permits as one Municipal Regional Stormwater NPDES Permit (Order No. R2-2015-0049, as amended by Order No. R2-2019-0004) to regulate stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara Counties, as well as the Cities of Fairfield, Suisun City, and Vallejo. MS4s are defined as conveyance systems that are owned by cities or other public entities, are designed to collect, or convey stormwater (including gutters, storm drains, pipes, and ditches), and are not part of a combined sewer or a publicly owned sewage treatment plant. Stormwater discharges in the San Francico Bay region are currently regulated by Order No. R2-2022-0018, as amended by Order No. R2-2023-0019, which supersede and rescind Order No. R2-2015-0049, as amended by Order No. R2-2019-0004.

Additionally, a General Permit for Discharge of Stormwater from small MS4s regulates the discharge of stormwater for the following municipalities: Marin County and its cities, Napa County and its cities, the City and County of San Francisco, Solano County and the City of Benicia, and Sonoma County and the Cities of Petaluma and Sonoma.

Additionally, each county has its own storm water pollution prevention programs (SWPPPs), which are intended to facilitate compliance with state and federal regulations through coordination with local municipalities, residents, businesses, and schools. These programs provide initiatives for preventing stormwater pollution; protecting and enhancing water quality in watersheds, waterways, creeks, and wetlands; and preventing water pollution in the San Francisco Bay and Pacific Ocean.

Solid Waste Disposal

Each Bay Area county, plus the Cities of Berkeley, Pittsburg, and San Jose, has a local enforcement agency (LEA) covering all solid waste facilities in the region. LEAs are responsible for ensuring the correct operation and closure of solid waste facilities in the state, as well as for guaranteeing the proper storage and transportation of solid wastes. In concurrence with the California Department of Resources Recycling and Recovery (CalRecycle), LEAs issue operating permits to facilities, including landfills, transfer stations, material recovery, and composting facilities. Solid waste is the garbage, refuse, and other discarded solid materials generated by residential, commercial, and industrial activities. CalRecycle identifies 10 categories of wastes: paper, glass, metal, electronics, plastic, other organic, construction and demolition (C&D), household hazardous waste, special waste, and mixed residue. Solid waste generation is measured by disposal and diversion. PRC Section 40192 defines disposal as “the final deposition of solid wastes onto land, into the atmosphere, or into the waters of the state.” Solid waste that is disposed of in landfills is measured in volume (cubic yards) and weight (tons). Diversion includes programs and practices such as waste prevention and source reduction, recycling, reuse, and composting that reduce the total amount of waste that requires disposal.

Landfills

The Bay Area is currently served by 14 privately operated landfills and one operated by the Sonoma County Public Works Department. The 14 landfills have a total remaining capacity of 255,002,535 cubic yards, a total daily throughput of 42,604 tons per day, and a total estimated 45% remaining capacity. **Table 3.14-5** shows the remaining capacity of landfills located in the Bay Area and their estimated date of closure.

Table 3.14-5: Active Bay Area Landfills

Site Name	SWIS Number	Estimated Closure Date	Max. Throughput (tons/day)	Permitted Capacity (Cu Yd)	Remaining Capacity (Cu Yd)	% Capacity Remaining
Altamont Landfill & Resource Recovery	01-AA-0009	12/01/2070	11,150	124,400,000	65,400,000	53%
Vasco Road Sanitary Landfill	01-AA-0010	12/31/2051	2,518	40,207,100	11,560,000	29%
Acme Landfill	07-AA-0002	07/01/2021	1,500	6,195,000	506,590	8%
Keller Canyon Landfill	07-AA-0032	12/31/2050	3,500	75,018,280	63,408,410	85%
USS-Posco Industries Waste Mgmt Unit II	07-AC-0042	01/01/2118	8	86,000	not available	not available
Redwood Landfill	21-AA-0001	1/1/2036	2,300	19,100,000	26,000,000	136%
Clover Flat Resource Recovery Park	28-AA-0002	01/01/2047	600	4,900,000	2,240,000	46%
Corinda Los Trancos Landfill (Ox Mtn)	41-AA-0002	01/01/2034	3,598	60,500,000	22,180,000	37%
Zanker Material Processing Facility	43-AN-0001	11/01/2025	350	640,000	640,000	100%
Newby Island Sanitary Landfill	43-AN-0003	01/01/2041	4,000	57,500,000	16,400,000	29%
Kirby Canyon Recycle.& Disp. Facility	43-AN-0008	12/31/2059	2,600	36,400,000	16,191,600	44%
Guadalupe Sanitary Landfill	43-AN-0015	12/31/2043	3,650	28,238,855	7,518,220	27%
Potrero Hills Landfill	48-AA-0075	02/14/2048	4,330	83,100,000	13,872,000	17%
Central Disposal Site	49-AA-0001	02/01/2039	2,500	32,650,000	9,085,715	28%
TOTAL			42,604	568,935,235	255,002,535	45%

Source CalRecycle 2024a; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Collection, Transfer, Recycling, and Material Recovery Facilities

There are 56 transfer stations in the Bay Area that receive solid waste and transfer it into containers or vehicles before it is finally disposed of in a landfill or transformation facility. The total maximum combined daily throughput capacity of transfer stations in the Bay Area is 90,522 tons per day. **Table 3.14-6** identifies the daily throughput of transfer facilities in the region. Several of the listed facilities also handle recycling services.

Table 3.14-6: Active Bay Area Transfer/Processing Facilities

Facility	SWIS Number	Max. Throughput (tons/day)
Pleasanton Garbage Service SW TS	01-AA-0003	720
Davis Street Transfer Station	01-AA-0007	5,600
Alameda Co Industries Direct Trans. Fac.	01-AA-0290	412
Fremont Recycling and Transfer Station	01-AA-0297	2,400
Livermore Sanitation Recy. Materials T/F	01-AA-0301	385
Bee Green Recycling & Supply	01-AA-0302	360
Certified Blue Recycling, Inc. (CDI Op.)	01-AA-0315	350
GreenWaste Transfer Station of Hayward	01-AA-0318	174
California Waste Solutions (Wood St.)	01-AA-0323	100
California Waste Solutions (10th St.)	01-AA-0324	100

Facility	SWIS Number	Max. Throughput (tons/day)
Tri-CED Community Recycling Facility	01-AA-0327	36,200
City of Berkeley Solid Waste Management Center & TS	01-AC-0029	560
Contra Costa TS And Recovery	07-AA-0027	1,900
Central Processing Facility	07-AA-0034	1,200
Golden Bear Waste Recycling Center	07-AA-0056	1,000
El Cerrito Recycling Center	07-AA-0063	99
Brentwood Transfer Station	07-AA-0068	400
Recycling Center & Transfer Station	07-AC-0043	1,500
Marin Sanitary Service Transfer Station	21-AA-0005	2,640
Devlin Road Transfer Station	28-AA-0027	1,440
City of Napa Material Diversion Facility	28-AA-0030	360
San Francisco Solid Waste Tran & Rec Cnt	38-AA-0001	3,000
Recycle Central at Pier 96	38-AA-0012	2,100
SFR Recovery Inc.	38-AA-0024	175
San Bruno Transfer Station	41-AA-0014	120
Shoreway Environmental Center	41-AA-0016	3,000
Blue Line MRF And TS	41-AA-0185	1,200
Recology San Martin Transfer Station	43-AA-0003	500
Sunnyvale MRF & Transfer Station	43-AA-0009	1,500
Z-Best Composting Facility	43-AA-0015	not available
Pacific Coast Recycling	43-AA-0021	100
Peninsula Sanitary Services Direct TF	43-AA-0032	149
Recology Pacheco Pass Wood Processing	43-AA-0035	175
Mission Trail Food Material Transfer Op.	43-AA-0037	99
Zanker Material Processing Facility	43-AN-0001	1,800
Zanker Road Resource Recovery Operation	43-AN-0007	2,600
BFI Newby Island Recyclery	43-AN-0014	1,600
Guadalupe Sanitary Landfill	43-AN-0015	3,650
Greenwaste Recovery Facility	43-AN-0019	3,500
Premier Recycling Facility	43-AN-0023	550
California Waste Solutions, Inc. (CWS)	43-AN-0024	530
Rogers Avenue Transfer Station	43-AN-0025	500
Valley Recycling	43-AN-0028	175
Valley Recycling 2	43-AN-0034	175
Leo Recycle	43-AN-0042	500
Bay Area Scavenger and Recycling	43-AN-0041	175
Mission Trail Transfer Station	43-AO-0002	375
Recology Vallejo	48-AA-0089	600
Sonoma Transfer Station	49-AA-0144	760
Global Materials Recovery Systems	49-AA-0390	544
West College Transfer Station	49-AA-0391	99
Windsor Material Recovery Facility	49-AA-0398	175
Recology Sonoma Marin	49-AA-0399	498

Facility	SWIS Number	Max. Throughput (tons/day)
Central Transfer Station	49-AA-0404	1,500
Recology Sonoma Marin	49-AA-0406	99
Pruitt Transload Facility	49-AA-0426	99
Total		90,552

Source: CalRecycle 2024b; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Composting, Chipping, and Grinding

There are 42 active composting facilities in the region that collect, grind, mix, pile, and add moisture and air to organic materials to speed natural decay and produce a soil amendment. Another 25 chipping and grinding facilities in the region are designed to reduce the size of compostable material (CalRecycle 2024b). Recycling, composting, chipping, and grinding all reduce the amount of solid waste that must be disposed of in a landfill.

Construction and Demolition and Inert Debris Facilities

C&D materials include lumber, drywall, metals, masonry (e.g., brick, concrete), carpet, plastic, pipe, rocks, dirt, paper, cardboard, or green waste related to land development. Metals are the most commonly recycled material, while lumber makes up the majority of debris that still goes to a landfill. There are 27 C&D recyclers and inert fill–disposal operations in the Bay Area (CalRecycle 2024b).

Energy Systems

Electric, liquid fuel, and natural gas energy sources make up most of the Bay Area energy systems, which are becoming increasingly diversified as newer, more renewable energy sources are developed and expanded. The plan area includes key energy infrastructure within the region that is exported to other portions of the State and neighboring states. The Bay Area is also a consumer of energy resources that are produced elsewhere and imported into the Bay Area. A range of public and private providers operate the energy systems in the plan area and maintain the regional infrastructure systems.

Energy System Providers

Pacific Gas and Electric Company (PG&E) is the major operator of electricity infrastructure in the nine-county San Francisco Bay Area. The company interfaces with a handful of municipal energy systems that have a mix of distribution and in some cases transmission and energy generation infrastructure, including SFPUC, City of Palo Alto Utilities, and Alameda Municipal Power. In addition to these municipal systems, local institutions are increasingly investing in on-site power generation or campus energy systems. Universities in the region have unique power operations as do a greater suite of buildings in the region that use microgrid technology that works independently of the main grid or in partial isolation during main system outages.

PG&E is one of the largest combination natural gas and electric utilities in the United States. The company, a subsidiary of PG&E Corporation, serves approximately 16 million people in 70,000 square miles of northern and central California. PG&E provides electric service to all nine counties in the plan area with natural gas coverage to most areas in the region except in a few more remote locations where no natural gas service is available.

PG&E obtains its electricity from natural gas, fossil fuels, nuclear power, hydroelectric power, and eligible renewable resources. In 2022, 95% of the electricity PG&E delivered to its customers came from sources that do not generate greenhouse gases (GHGs). The mix of sources generating electricity was 38% renewable resources (biomass, geothermal, small hydroelectric, solar, and wind), 49% nuclear power, 8% large hydroelectric power, and 5% natural gas and other fuels (PG&E 2023).

PG&E provides a number of incentives for rooftop solar, solar water heating, fuel cells, wind, battery storage, advanced LED lighting, and other advanced technologies that help customers reduce their energy bills and their carbon footprint. PG&E also continues to encourage customers to invest in cost-effective energy efficiency measures and offers electric vehicle–charging pricing plans (PG&E 2024a).

Community Choice Aggregations (CCAs) are not-for-profit public agencies that purchase contracts for electric generation with a lower GHG content. PG&E delivers electricity provided through CCAs, maintaining the power lines, and responding to service calls and emergencies. In the plan area, there are seven CCAs: Ava Community Energy (formerly East Bay Community Energy), CleanPowerSF, Marin Clean Energy (which operates in Marin, Napa, Solano, and Contra Costa Counties), Peninsula Clean Energy, San Jose Clean Energy, Silicon Valley Clean Energy, and Sonoma Clean Power.

Chevron, Phillips 66, Valero, Shell, and Tesoro are the major companies that run fuel operations out of Bay Area refineries. In addition, Kinder Morgan pumps fuel in major transmission lines from its pumping facility in Concord across the region and out of the region to other portions of northern California and Reno, Nevada. From those locations, smaller companies across the region truck the fuel to gas stations and fueling stations across the region.

Energy System Infrastructure

Electric power delivery is largely composed of a four-phase process: generation, transmission, substation transformation (high voltage to lower voltage), and distribution. In 2022, the nine-county region consumed 53,591 gigawatt-hours of electricity (CEC 2022a). The remaining demand was met by power imports generated elsewhere in the State, the Pacific Northwest, and the Southwest. Ninety-eight percent of the regionally produced power is generated at 25 large facilities with the remaining 2% generated at 44 small facilities with less than 50-megawatt capacity (ABAG 2014).

Most of the Bay Area power is transmitted on 500-, 230-, 115-, and 60-kilovolt aboveground transmission lines by PG&E. A handful of local jurisdictions operate their distribution system, but most are reliant in some way on PG&E for power supply. The high-voltage transmission lines distribute electricity from regional and outside generation facilities to substations. Some substations are simply nodes along a stretch of transmission lines, while others drop the high-voltage transmission lines to lower-voltage distribution lines. From the substations, distribution lines route power at a lower voltage to the end user.

Bay Area liquid fuel infrastructure can be described in four primary stages: crude oil import, refinement, fuel transmission export, and fuel distribution. Crude oil is imported by pipeline from the east, rail from the north, and marine tankers from the west. In 2023, approximately 23% of crude oil was extracted in California, mainly in Kern County, with the remainder coming from Alaska and foreign sources (CEC 2024a).

As of October 2024, the San Francisco Bay Area has three active oil refineries with a combined capacity to process 546,671 barrels of crude oil a day, which is 34% of the State's total crude oil capacity. California's total crude oil capacity was 1,622,171 barrels per day (CEC 2024b). The active Bay Area refineries are located along the San Pablo Bay and the Carquinez Strait. Once refined, the variety of fuel products is pumped and piped across the State to terminal facilities that serve all northern California and northern Nevada. In addition to refining all the fuel it uses, California refines most of Nevada's fuel and nearly 50% of Arizona's fuel (CEC 2022b). The refineries in the Bay Area supply 100% of the plan area's fuel, northern California's fuel, northern Nevada's fuel, and a portion of central California counties' fuel (which is also supplied by Kern County refineries). Once refined, fuel is delivered to terminal facilities, where fuel tanker trucks distribute fuel locally using the road network.

Natural gas is primarily used for electric power generation and as a residential, commercial, and industrial energy resource. Natural gas provides the largest portion of the total in-state capacity and electricity

generation in California, with nearly 45% of the natural gas burned in California used for electricity generation. Almost 90% of natural gas in California is generated out of state and is imported through interstate pipelines from the southwest, the Rocky Mountains, and Canada (CEC 2024c).

PG&E runs natural gas transmission pipelines throughout the plan area. Local distribution lines exist under most urban and suburban local roads in the region with large transmission lines running along the Interstate 280 and US 101 corridors from San Francisco to Palo Alto, along State Route 237 in northern Santa Clara County, along the Interstate 880 and 80 corridor from Santa Clara County to western Contra Costa County, along the Interstate 680 and State Route 84 corridor from western Alameda to eastern Alameda County and portions of the Interstate 580 corridor in eastern Alameda County, and along State Route 4 in eastern Contra Costa County. In the North Bay, transmission lines run along the US 101 corridor from Mill Valley in Marin County through Cloverdale in Sonoma County, as well as along State Route 128 in Sonoma and Napa Counties and across State Route 12 in Sonoma, Napa, and Solano Counties (PG&E 2024b).

Telecommunication Services

Telecommunications are mainly a privately owned enterprise and are offered by a variety of companies with different service capacities across the plan area. The number of providers offering the service, the type of service available, and the transmission speed of the service all affect the quality of telecommunications. This approach differs from that of most other utilities, which are generally publicly owned or offered by limited or individual service providers in a given area.

Telecommunication Providers

Many telecommunications providers offer phone, Internet, and/or television service in the plan area for the proposed plan, as shown in **Table 3.14-7**. Telecommunications providers will usually complete infrastructure and other service improvements for an area as the need arises to meet customer demand.

Table 3.14-7: Consumer Telecommunications Service Providers in the Plan Area

Consumer Telecommunications Service Provider	Type of Broadband	Plan Area Service Reach by County (not complete coverage)[1]
AFES Network Services LLC	Terrestrial Fixed Wireless	Solano
AT&T Mobility	GSM, LTE	All
AT&T Service Inc.	Terrestrial Fixed Wireless	Contra Costa, San Mateo
	ADSL2/ADSL2+, Asymmetric xDSL	All
AVISP	Terrestrial Fixed Wireless	Sonoma
CalDSL	Terrestrial Fixed Wireless	Contra Costa
CalNeva Broadband	Cable Modem DOCSIS 3.0	Sonoma
Comcast	Cable Modem DOCSIS 3.0	San Mateo
	Cable Modem DOCSIS 3.1	All
Common Networks	Terrestrial Fixed Wireless	Alameda
Cruzio	Terrestrial Fixed Wireless	Santa Clara
DigitalPath, Inc.	Terrestrial Fixed Wireless	Napa, Solano, Sonoma
Dillon Beach Internet Services	Terrestrial Fixed Wireless	Marin
Etheric Networks Inc.	Terrestrial Fixed Wireless	Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara
Frontier Communications	ADSL2/ADSL2+, Asymmetric xDSL	Marin, Santa Clara, Solano, Sonoma
	VDSL	Santa Clara, Solano
Further Reach	Terrestrial Fixed Wireless	Solano

Consumer Telecommunications Service Provider	Type of Broadband	Plan Area Service Reach by County (not complete coverage)[1]
Google Fiber LLC	Optical Carrier/Fiber to the end user	Santa Clara
Hankins Information Technology	Terrestrial Fixed Wireless	Santa Clara
Horizon Cable TV	Cable Modem DOCSIS 3.0	Marin
Internet Free Planet	Terrestrial Fixed Wireless	Solano
Inyo Networks	Optical Carrier/Fiber to the end user	Marin
Napanet Internet Services	Terrestrial Fixed Wireless	Napa
Oasis Broadband	Terrestrial Fixed Wireless	Contra Costa, Santa Clara
Paxio	Optical Carrier/Fiber to the end user	Santa Clara
Race Communications	Optical Carrier/Fiber to the end user	San Francisco, San Mateo, Sonoma
Raw Bandwidth Communications	ADSL2/ADSL2+	Alameda, San Francisco, San Mateo, Santa Clara
	VDSL	San Francisco, San Mateo
Razzo Link, Inc.	Terrestrial Fixed Wireless	Santa Clara
San Bruno CityNet Services	Cable Modem DOCSIS 3.0, Optical Carrier/Fiber to the end user	San Mateo
Sonic.net	ADSL2/ADSL2+	All
	Optical Carrier/Fiber to the end user	Alameda, Contra Costa, San Francisco, San Mateo, Sonoma
	VDSL	All
SouthValleyInternet	ADSL2/ADSL2+, Asymmetric xDSL, Symmetric xDSL, Terrestrial Fixed Wireless	Santa Clara
Sprint Communications Inc.	CDMA, LTE	All
Surfnet Communications	Terrestrial Fixed Wireless	Santa Clara
T-Mobile	GSM, LTE	All
Tekify Fiber and Wireless	Optical Carrier/Fiber to the end user, Terrestrial Fixed Wireless	Alameda
Valley Internet	Terrestrial Fixed Wireless	Napa, Solano
Verizon Wireless	CDMA, LTE	All
Vista Broadband Networks, Inc.	Terrestrial Fixed Wireless	Marin, Napa, Solano, Sonoma
Wave Broadband	Cable Modem DOCSIS 1/1.0/2.0	Contra Costa, San Francisco, San Mateo
	Cable Modem DOCSIS 3.0, Cable Modem DOCSIS 3.1, Optical Carrier/Fiber to the end user	Contra Costa, San Francisco, San Mateo, Solano
Webpass, Inc.	Terrestrial Fixed Wireless	Alameda, San Francisco
WebPerception LLC	Terrestrial Fixed Wireless	All
Winters Broadband LLC	Terrestrial Fixed Wireless	Solano

[1] Service reach determined from 2018 map data and may vary from what is currently available.

Source: CPUC 2023; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

There are 39 telecommunications providers offering services across the plan area. Some providers offer service across all nine counties, while others have focused service within a single jurisdiction. **Table 3.14-7** lists the consumer telecommunication service providers in the plan area (CPUC 2023).

Telecommunication Infrastructure

Telecommunication infrastructure includes phone, wireless, cable, and Internet platforms, each with infrastructure components that are stand alone or shared. Phone service providers use a combination of underground lines and aboveground cellular towers to provide telephone service to the plan area. Cellular towers are located in range of areas and are often designed to blend into the surroundings.

Wireless technology is largely encompassed by 5G. "5G" is an umbrella term for a set of international wireless standards. Capabilities and advantages of a 5G wireless technology include enhanced mobile broadband; speeds faster than those available through 4G; less expensive connectivity; and reliable, resilient, and instantaneous connectivity that allows connection of a variety of devices.

Internet service may be provided through mobile (i.e., cellular phone), wireless (Wi-Fi), hotspots (i.e., wireless local area network), phone line (i.e., integrated services digital network), or broadband (i.e., DSL, cable) connections. Cable television is primarily provided by hardwired infrastructure and is also available via satellite connections. Cable fibers and copper wires are generally co-located and installed concurrently with other utility infrastructure. This infrastructure is usually installed underground within new development to reduce visual and aesthetic impacts and any potential safety hazards. Fiber cables, the fastest form of communications infrastructure, are also co-located and installed underground. However, fiber optic networks generally serve larger urban areas where demand offsets the high cost of installing the fiber optics. Additionally, television and Internet services can be provided through satellite connections and Wi-Fi networks that allow electronic devices to communicate using radio waves rather than a wire.

Broadband refers to a high-speed connection to the Internet that is always on, as opposed to other connections (e.g., dial-up) that need to be turned on with every use. The region is served by mobile broadband. Fixed wireless broadband service is available at varying speeds throughout the plan area. Wireline broadband is the least available service because it is generally offered only near more developed areas.

3.14.2 Regulatory Setting

FEDERAL REGULATIONS

Federal Power Act of 1935

The Federal Power Act of 1935 (16 US Code Section 791 et seq.) created the Federal Power Commission, an independent regulatory agency with authority over both the interstate transmission of electricity and the sale of hydroelectric power at the wholesale level. The act requires the commission to ensure that electricity rates are "reasonable, nondiscriminatory, and just to the consumer." The Federal Power Act also amended the criteria that the commission must apply in deciding whether to license the construction and operation of new hydroelectric facilities. The Federal Power Commission was dissolved and is now known as the Federal Energy Regulatory Commission (FERC). FERC acts under the legal authority of the Federal Power Act, the Public Utility Regulatory Policies, and the Energy Policy Act (EPAct) (42 US Code Section 13201 note), as well as other federal acts.

Natural Gas Act of 1938

Together with the Federal Power Act, described above, the Natural Gas Act (15 US Code Section 717 et seq.) helped to establish federal energy regulation. The Natural Gas Act became the first legislation to

regulate the natural gas industry, enabling federal regulators to set prices for gas sold in interstate commerce in exchange for exclusive rights to transport the gas.

US Department of Transportation – Act of Congress 1966

The US Department of Transportation (DOT) was established by an act of Congress in 1966 as a federal department of the US government concerned with transportation. Propane transportation is regulated by DOT. With authority stated in Title 49 of the CFR, DOT requires that all shipping papers contain a 24-hour-a-day telephone number where emergency assistance and information can be obtained. This service must provide information about any cargo that DOT classifies as a hazardous material. There are several sources in the United States that an emergency response crew leader can contact in the case of a transportation accident.

Safe Drinking Water Act

The Safe Drinking Water Act, as passed in 1974 and amended in 1996, gives EPA the authority to set drinking water standards. Drinking water standards apply to public water systems that provide water for human consumption through at least 15 service connections or regularly serve at least 25 individuals. There are two categories of drinking water standards: the National Primary Drinking Water Regulations (NPDWRs) and the National Secondary Drinking Water Regulations. The NPDWRs are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water. The act protects against both naturally occurring and human-made contaminants in drinking water and requires that information on the quality of drinking water be made available to the public.

Clean Water Act

Section 402 of the Clean Water Act (CWA) establishes the NPDES permit program to regulate the discharge of pollutants from point sources. The CWA defines point sources of water pollutants as "any discernible, confined, and discrete conveyance" that discharges or may discharge pollutants. The 1972 amendments to the CWA prohibit the discharge of pollutants to navigable waters from a point source unless the discharge is authorized by an NPDES permit. The CWA requires NPDES permits for stormwater discharges caused by general construction activity, industrial activity, and municipal drainage collection. The purpose of the NPDES program is to establish a comprehensive stormwater quality program to manage urban stormwater, reducing pollution of the environment as much as possible. The NPDES program involves characterizing the quality of receiving water, identifying harmful constituents, targeting potential sources of pollutants, and implementing a comprehensive stormwater management program. In California, NPDES permits are issued by RWQCBs.

Provision C.3

On May 17, 1996, EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for postconstruction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low-impact development (LID) techniques.

Resource Conservation and Recovery Act of 1976

The Resource Conservation and Recovery Act of 1976, Subtitle D (Subtitle D) focuses on state and local governments as the primary planning, regulating, and implementing entities for the management of nonhazardous solid waste, such as household garbage and nonhazardous industrial solid waste. To promote the use of safer units for solid waste disposal, Subtitle D provides regulations for the generation, transportation, and treatment, storage, or disposal of hazardous wastes. EPA developed federal criteria for the proper design and operation of municipal solid waste landfills and other solid waste disposal facilities, but state and local governments are the primary planning, permitting, regulating, implementing, and enforcement agencies for management and disposal subject to approval by EPA. EPA approved the state of California's program, a joint effort of the California Integrated Waste Management Board (now CalRecycle), SWRCB, RWQCBs, and LEAs, on October 7, 1993.

Federal Energy Regulatory Commission of 1977

FERC was created by the Department to Energy Organization Act of 1977 and established within the US Department of Energy. It replaced the Federal Power Commission, which was created by the Federal Power Act of 1935. FERC regulates the transmission and sale of electricity in interstate commerce, oversees licensing of hydroelectric projects, and provides oversight of related environmental matters.

Natural Gas Policy Act of 1978

The Natural Gas Policy Act (15 US Code Section 3301 et seq.) granted FERC authority over intrastate and interstate natural gas production. It established price ceilings for wellhead first sales of gas that vary with the applicable gas category and gradually increase over time.

Public Utility Regulatory Policies Act of 1978

The Public Utility Regulatory Policies Act (PURPA) (Public Law 95-617), which was passed in response to the energy crisis of the late 1970s, sought to promote the conservation of electric energy. PURPA also created small power producers as a new class of nonutility generators from which utilities are required to buy more power.

The PURPA was also intended to augment electric utility generation with more efficiently produced electricity and to provide equitable rates to electric consumers. Utility companies are required to buy all electricity from "Qfs" (qualifying facilities) at avoided cost (avoided costs are incremental savings associated with not having to produce additional units of electricity). The PURPA expanded participation of nonutility generators in the electricity market and demonstrated that electricity from nonutility generators could successfully be integrated with a utility's own supply. The PURPA requires utilities to purchase whatever power is produced by Qfs (typically cogeneration or renewable energy).

Energy Policy Act of 1992

The EPAct of 1992 was passed to reduce the country's dependence on foreign petroleum and improve air quality. It addressed energy efficiency, energy conservation and management, natural gas imports and exports, alternative fuels, electric motor vehicles, radioactive waste, goal power and clean coal, renewable energy, and other issues. It reformed the Public Utility Holding Company Act (Wheeler-Rayburn Act) of 1935 (15 US Code Section 79 et seq.) and amended parts of the Federal Power Act of 1935. For more information, see Section 3.6, "Climate Change, Greenhouse Gases, and Energy."

Energy Policy Act of 2005

The EPAct of 2005 was signed on August 8, 2005, by President George W. Bush. The comprehensive energy legislation provided several electricity-related provisions:

- Ensure that consumers receive electricity through dependable, modern infrastructure.
- Remove outdated obstacles to investment in electricity transmission lines.
- Make electricity reliability standards mandatory.
- Give federal officials the authority to site new power lines in US Department of Energy–designated national corridors in limited circumstances.

The EPAct also created the Renewable Fuel Standard (RFS) program to reduce GHG emissions and expand the renewable fuels sector. The program regulations were developed in collaboration with stakeholders from many energy sectors, including refiners, renewable fuel producers, and others. As required under the EPAct, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012.

Clean Air Act

Section 211(o) of the Clean Air Act, as amended by the Energy Policy Act of 2005, requires the EPA administrator to annually determine an RFS applicable to refiners, importers, and certain blenders of gasoline and to publish the standards in the *Federal Register* each year by November 30. On the basis of this standard, each obligated party must determine the appropriate proportion of renewable fuel as motor vehicle fuel. The standard is calculated as a percentage, dividing the amount of renewable fuel required by the Clean Air Act into the expected gasoline usage during that year, including certain adjustments. The RFS program established a 13.13% annual renewable fuel standard for 2025 (EPA 2023).

Telecommunication Act of 1996

The Telecommunications Act (47 US Code) was the first major overhaul of US telecommunications law in nearly 62 years, amending the Communication Act of 1934 (47 US Code Section 151 et seq.). The act deregulates local phone service, allows long-distance carriers and cable television companies to provide local phone service, and allows local telephone companies to provide long-distance service.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act (EISA) (Public Law 110-140) was signed into law by President George W. Bush on December 19, 2007. The EISA's goal is to achieve energy security in the United States by increasing the production and use of renewable fuels, reducing dependence on oil, improving energy efficiency and performance, protecting consumers, and promoting research on GHG capture and storage. The EISA updated the RFS program (RFS2) in several key ways:

- expanded the RFS program to include diesel in addition to gasoline,
- increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons in 2022,
- established new categories of renewable fuel with accompanying volume requirements, and
- required EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

RFS2 laid the foundation for achieving significant GHG reductions from the use of renewable fuels, reducing imported petroleum, and encouraging the development and expansion of the national renewable fuels sector. The EISA also included a variety of new standards for lighting and appliance equipment, such as residential refrigerators and metal halide lamps, and commercial coolers and freezers.

STATE REGULATIONS

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act established SWRCB and divided the state into nine regions, each overseen by a separate RWQCB. Each RWQCB region is required to prepare and update a basin plan for its jurisdictional area. The RWQCBs also issue waste discharge requirements (WDRs) for discharges of privately or publicly treated domestic wastewater to locations other than surface water, such as groundwater basins. The plan area is largely within the San Francisco Bay RWQCB, with portions in the North Coastal, Central Coastal, and Central Valley RWQCBs.

New or expanded landfills must submit Reports of Waste Discharge to RWQCBs prior to landfill operations. In conjunction with CalRecycle approval of solid waste facility permits, RWQCBs issue Waste Discharge Orders, which regulate the liner, leachate control and removal, and groundwater monitoring systems at Class III landfills. While Waste Discharge Orders apply only to landfills, RWQCBs also regulate surface water runoff for all solid waste facilities by issuing stormwater discharge permits under the NPDES program. Separate NPDES permits are issued for the construction and operation of these facilities.

Construction General Permit

The California Construction Stormwater Permit (Construction General Permit), adopted by SWRCB, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least 1 acre of total land area. The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. It prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges and all discharges that contain a hazardous substance in excess of reportable quantities, unless a separate NPDES permit has been issued to regulate those discharges. The Construction General Permit requires that all developers of land where construction activities will occur over more than 1 acre:

- complete a risk assessment to determine pollution prevention requirements pursuant to the three risk levels established in the permit,
- eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States,
- develop and implement a SWPPP that specifies BMPs that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards, and
- perform inspections and maintenance of all BMPs.

To obtain coverage under the NPDES Construction General Permit, the legally responsible person must electronically file all permit registration documents with SWRCB before the start of construction. Permit registration documents must include the following elements:

- notice of intent,
- risk assessment,
- site map,
- SWPPP,
- annual fee, and
- signed certification statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address postconstruction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

California Department of Transportation NPDES Permit

In June 2022, SWRCB adopted the Statewide Stormwater Permit and Time Schedule Order for the California Department of Transportation (Caltrans). This permit regulates non-stormwater and stormwater discharges from Caltrans's MS4 and from Caltrans-owned right of way, parking, storage, and maintenance facilities. The Caltrans permit requires development of a program for communication with local agencies and coordination with other MS4 programs where those programs overlap geographically with Caltrans facilities. As part of the permit, Caltrans is required to create and annually update a stormwater management plan (SWMP) that is used to outline the regulation of pollutant discharge caused by current and future construction and maintenance activities. SWMP requirements apply to discharges from Caltrans stormwater conveyances, including catch basins and drain inlets, curbs, gutters, ditches, channels, and storm drains. The SWMP applies to discharges consisting of stormwater and non-stormwater resulting from:

- maintenance and operation of state-owned highways, freeways, and roads;
- maintenance facilities;
- other facilities with activities that have the potential for discharging pollutants;
- permanent discharges from subsurface dewatering;
- temporary dewatering; and
- construction activities.

The discharges addressed by the SWMP flow through municipal stormwater conveyance systems or flow directly to surface water bodies in the state. These surface water bodies include creeks, rivers, reservoirs, lakes, wetlands, lagoons, estuaries, bays, and the Pacific Ocean and tributaries.

This SWMP applies to the oversight of activities performed by outside agencies or non-Caltrans entities (third parties) within Caltrans' MS4 to ensure compliance with stormwater regulations. Non-Caltrans activities include highway construction and road improvement projects, as well as residential use and business operations on leased property.

The SWMP must be approved by SWRCB, and as specified in the permit, it is an enforceable document. Compliance with the permit is measured by implementation of the SWMP. Caltrans' policies, manuals, and other guidance related to stormwater are intended to facilitate implementation of the SWMP. Caltrans also requires all contractors to prepare and implement a program to control water pollution effectively during the construction of all projects. In lieu of the more recently adopted Construction General Permit, as described above, Caltrans continues to modify its current policies and procedures to be consistent with the new permit.

California Code of Regulations, Title 22

Under Title 22, the California Department of Public Health establishes statewide effluent bacteriological and treatment reliability standards for recycled water uses. The standards are based on the potential for human contact with recycled water. The RWQCB has established and enforces requirements for the application and use of recycled water. Permits are required from an RWQCB for any recycling operation. Applicants for a permit are required to demonstrate that the proposed recycled water operation is in compliance with Title 22 and will not exceed the groundwater or surface water quality objectives in the regional basin management plan.

Water Conservation Act of 2009

The Water Conservation Act of 2009, enacted as Senate Bill (SB) X7-7, set water conservation targets and efficiency improvements for urban and agricultural water suppliers in Section 10608.16 and Section 10608.48, respectively, of the Water Code. The legislation establishes a statewide target to reduce urban per capita water use by 20% by 2020. The state was required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. Urban water suppliers cannot impose conservation requirements on process water (water used in the production of a product) and are required to employ two critical efficient water management practices: water measurement and pricing. Urban retail water suppliers must include in a water management plan the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. Notably, new water use efficiency targets that go beyond those established under this act will be developed as part of a long-term conservation framework for urban water agencies per Executive Order B-37-16, described below.

In 2018, new landmark water conservation legislation was signed into law. Together, Assembly Bill (AB) 1668 and SB 606 lay out a new long-term water conservation framework for California. Programs and initiatives are organized around four primary goals: use water more wisely, eliminate water waste, strengthen local drought resilience, and improve agricultural water use efficiency and drought planning.

Executive Order B-37-16

In May 2016, Governor Brown issued Executive Order B-37-16, which bolsters the State's climate and drought resilience. Built on the temporary statewide emergency water restriction, Executive Order B-37-17 directs five state agencies to establish a long-term water conservation framework that will enhance the resiliency of California communities against climate change and drought. The Executive Order is intended to eliminate water waste, use water more wisely, strengthen local drought resilience, and improve agricultural water use efficiency and drought planning.

California Urban Water Management Planning Act

Section 10610 of the state Water Code, known as the California Urban Water Management Planning Act, states that each urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, must prepare a UWMP and update it every five years to ensure that the reliability of its water service is sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The act describes the contents of UWMPs and requires each agency's UWMP to assess the reliability of the agency's water resources over a 20-year planning horizon.

Water Supply Assessment and Water Supply Verification

California SB 610 and SB 221 ensure that sufficient water supplies are available for growing communities by increasing the reporting in a water supply assessment (WSA) for new development projects. The WSA must document sources of water supply, quantify water demands, and compare future water supply and demand to show that sufficient water will be available to serve the development project. Water supply must be assessed for normal, single dry, and multiple dry water years during a 20-year forecast. If supplies are found to be insufficient to serve the project, the WSA must include plans for acquiring sufficient supplies. The WSA must be included in the CEQA document for the project. SB 221 applies to subdivisions of more than 500 dwelling units (Water Code Section 10912). Like SB 610, it is intended to ensure an adequate water supply for new development. SB 221 requires that approval of a tentative map showing the design and improvement of a proposed subdivision include a requirement that a sufficient water supply is available.

In September 2016, the governor signed SB 1262 to amend SB 610 and SB 221 in order to address the relationship between California's water supply planning laws and groundwater management requirements under the Sustainable Groundwater Management Act (SGMA). SB 1262 requires that during environment review, a project reliant on groundwater as a water source must provide additional information in its WSA and negates the identification of hauled water as a water source in a WSA.

California Groundwater Management Act

The Groundwater Management Act (AB 3030, Water Code Section 10750 et seq.) provides guidance for applicable local agencies to develop voluntary groundwater management plans in state-designated groundwater basins. Groundwater management plans can allow agencies to raise revenue to pay for measures influencing the management of the basin, including extraction, recharge, conveyance, facilities' maintenance, and water quality.

Sustainable Groundwater Management Act of 2014

SGMA (Water Code Sections 10720–10737.8) provides local agencies with the tools to manage groundwater basins in a sustainable manner over a long-term horizon and allows for limited state intervention when necessary to protect groundwater resources. It requires the formation of local groundwater sustainability agencies that must assess conditions in their local water aquifer basins and adopt locally based management plans by 2022 that address sustainable groundwater levels. SGMA requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. The SGMA provides 20 years for groundwater sustainability agencies to implement plans and achieve long-term groundwater sustainability.

State Water Resources Control Board and Regional Water Quality Control Boards

SWRCB issues individual and general NPDES permits for wastewater and stormwater through the authorization of EPA. Discharges that may affect surface water or groundwater, and that are not regulated by an NPDES permit, are issued a WDR that serves as a permit under the authority of the California Water Code. The RWQCBs issue land disposal WDRs that permit certain solid and liquid waste discharges to land to ensure that wastes do not reach surface water or groundwater. Land disposal WDRs contain requirements for liners, covers, monitoring, cleanup, and closure. The RWQCBs also permit certain point source discharges of waste to land that have the potential to affect surface water or groundwater quality. This category of discharges, known as "Non-15" discharges, are the most diverse and include sewage sludge and biosolids, industrial wastewater from power plants, wastes from water supply treatment plants, treated wastewater for aquifer storage and recovery, treated groundwater from cleanup sites, and many others.

SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary in 2018. The amendments established water quality objectives to maintain Bay-Delta ecosystem health. The SWRCB intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by 2022; however, its implementation is uncertain for several reasons, including ongoing litigation and because the Bay-Delta Plan Amendment provides a regulatory framework for flow allocation, which must be achieved through other proceedings (SFPUC 2021).

SWRCB has issued the following regulations, which are related to wastewater collection and treatment facilities, stormwater drainage facilities, and landfills:

- Caltrans NPDES Permit (Order 2022-0033-DWQ) requires Caltrans to regulate nonpoint source discharge from its properties, facilities, and activities. Among other requirements, Caltrans must annually update an enforceable SWMP.

- Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2022-0103-DWQ) require all federal and state agencies, municipalities, counties, districts, and other public entities that own, operate, or are otherwise responsible for sanitary sewer systems greater than 1 mile in length that collect and/or convey untreated wastewater to a publicly owned treatment facility in California to prepare sewer system management plans and report all sanitary sewer overflows to SWRCB.

AB 885 - On-Site Wastewater Treatment Systems

AB 885 (Chapter 781, Statutes of 2000) required SWRCB to draft and implement regulations for siting, installation, operation, and maintenance of on-site wastewater treatment systems. Proposed regulations were issued in 2009 and adopted in June 2012.

Integrated Waste Management Regulations (AB 939, AB 341, and SB 1016)

To minimize the amount of solid waste that must be disposed of, the state legislature passed the California Integrated Waste Management Act of 1989 (IWMA), effective January 1990. Under AB 939, all cities and counties were required to divert at least 50% of solid waste from landfill facilities by 2000 and every year thereafter. This act also requires every city and county to report to CalRecycle annually and requires jurisdictions to begin planning for new landfills when the jurisdiction's primary disposal site reaches its 15-year capacity.

The IWMA establishes a hierarchy of preferred waste management practices: (1) source reduction (waste prevention) to reduce the amount of waste generated at its source, (2) recycling (or reuse) and composting, (3) transformation, and (4) disposal by landfilling. The IWMA requires the preparation of a countywide integrated waste management plan, including a countywide siting element that must demonstrate a remaining landfill disposal capacity of at least 15 years to serve all the jurisdictions in the county. The countywide siting element must include a combination of strategies to demonstrate adequate capacity, including existing, proposed, and tentative landfills or expansions; increased diversion efforts; and the export of solid waste for disposal. As part of the countywide integrated waste management plan, the IWMA also requires that each jurisdiction (cities and the county) prepare a source reduction and recycling element, a household hazardous waste element, and a non-disposal facility element.

SB 1016, passed in 2008, builds on AB 939 compliance requirements by implementing a streamlined measure of jurisdictions' performance. SB 1016 accomplishes this by focusing on a disposal-based indicator rather than diversion rates. The per capita disposal rate uses two factors: a jurisdiction's residents/employees and its disposal amount as reported by disposal facilities. Thus, rather than mandating a 50% or more diversion of solid waste, SB 1016 requires a 50% or less disposal rate of solid waste per capita. In 2012, the California Legislature sought to further reduce solid waste disposal rates through AB 341, which set a goal of 75% recycling, composting, or source reduction of solid waste statewide by 2020 (CalRecycle 2024c).

Short-Lived Climate Pollutants Organic Waste Methane Emissions Reductions (SB 1383)

SB 1383 (2016) established methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants in various sectors of California's economy. The new law codifies the California Air Resources Board's Short-Lived Climate Pollutant Reduction Strategy and established targets to achieve a 50% reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75% reduction by 2025. The law granted CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and established an additional target that not less than 20% of currently disposed edible food is recovered for human consumption by 2025.

AB 1826

AB 1826 (Chapter 727, Statutes of 2014 [Chesbro]) requires businesses that generate a specific amount of organic waste per week to arrange for recycling services for that waste and requires jurisdictions to implement a recycling program to divert organic waste from businesses subject to the law, as well as report to CalRecycle on their progress in implementing an organic waste recycling program. CalRecycle has phased the requirements, starting first in 2016, requiring businesses with more than 8 cubic yards of organic waste per week, and expanding to businesses with 4 or more cubic yards in 2017. In 2020, CalRecycle initiated the final expansion to include all businesses with more than 2 cubic yards of organic waste, providing an exemption of rural areas through December 31, 2026.

California Renewables Portfolio Standard Program

The California Renewables Portfolio Standard (RPS) was established by SB 1078 in 2002 and has been revised multiple times, most recently by SB 100 (Chapter 312, Statutes of 2018). SB 100 established new goals for the RPS program of achieving a 50% renewable resources target by 2026 and a 60% target by 2030. It requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy sources so that the total kilowatt-hours of those products sold achieves 44% of retail sales by 2024, 52% by 2027, and 60% by 2030. It also requires that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity produced to serve all state agencies by 2045.

California Building Energy Efficiency Standards (Title 24, Part 6)

The energy consumption of new residential and nonresidential buildings in California is regulated by CCR Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). Known by the shorthand name of "Title 24," this policy was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The California Energy Commission (CEC) updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The current California Energy Code will require builders to use more energy-efficient building technologies for compliance with increased restrictions on allowable energy use. The currently adopted 2022 Energy Code applies to buildings for which permit applications were applied on or after January 1, 2023. The 2022 Energy Code builds on the previous energy code by encouraging efficient electric heat pumps, establishing electric-ready requirements for new homes, expanding solar photovoltaic and battery storage standards, and strengthening ventilation standards.

Title 14, California Code of Regulations

CCR, Title 14, Chapter 3 establishes minimum standards for solid waste handling and disposal. CalRecycle regulations pertaining to nonhazardous waste management in California include minimum standards for solid waste handling and disposal; regulatory requirements for composting operations; standards for handling and disposal of asbestos-containing waste; resource conservation programs; enforcement of solid waste standards and administration of solid waste facility permits; permitting of waste tire facilities and waste tire hauler registration; special waste standards; used oil recycling program; electronic waste recovery and recycling; planning guidelines and procedures for preparing, revising, and amending CIWMP; and solid waste cleanup program.

Title 27, California Code of Regulations

CalRecycle and SWRCB jointly issue regulations pertaining to waste disposal on land, including criteria for all waste management units, facilities, and disposal sites; documentation and reporting; enforcement; financial assurance; and special treatment, storage, and disposal units. Title 27 regulations require a significant proportion of the waste stream must be diverted from landfill disposal. Objectives of waste

diversion programs address individual diversion techniques, including source reduction, curbside recycling, green waste collection, and load-checking to prevent illegal disposal at dump sites.

California Department of Water Resources

DWR is responsible for the planning, construction, and operation of SWP facilities. It also sets conditions on use of SWP facilities. In addition, DWR is responsible for statewide water planning, evaluating UWMPs, overseeing dam safety and flood control, and transferring certain water rights permits (e.g., pre-1914).

California Model Water Efficient Landscape Ordinance

The California Model Water Efficient Landscape Ordinance (MWELO) sets restrictions on outdoor landscaping. The Bay Area contains several local agencies under the MWELO that require project applicants to prepare plans consistent with the requirements of the MWELO for review and approval. The MWELO was most recently updated by DWR and approved by the California Water Commission on July 15, 2015. All provisions became effective on February 1, 2016. The revisions, which apply to new construction with a landscape area greater than 500 square feet, reduced the allowable coverage of high-water-use plants to 25% of the landscaped area. The MWELO also requires use of a dedicated landscape meter on landscape areas for residential landscape areas greater than 5,000 square feet or nonresidential landscape areas greater than 1,000 square feet, it and requires weather-based irrigation controllers or soil moisture–based controllers or other self-adjusting irrigation controllers for irrigation scheduling in all irrigation systems. Local agencies must either adopt the MWELO or may adopt a more stringent local ordinance.

California Green Building Standards Code, Construction Waste Reduction Requirements

The California Green Building Standards Code requires builders/owners to divert a minimum of 65% of the waste from covered projects (i.e., new construction, demolition, and/or addition to nonresidential and residential structures requiring construction or building permit). This can be met through three methods: (1) develop and submit a waste management plan to the jurisdiction's enforcement agency that identifies materials and facilities to be used and document diversion; (2) use a waste management company, approved by the enforcing agency, that can document 65% diversion; or (3) use the disposal reduction alternative, as appropriate for the type of project. If the waste management plan option is used, the plan should be developed before construction begins, and project managers should use the project's planning phase to estimate materials that will be generated and identify diversion strategies for those materials. The California Department of Housing and Community Development has developed suggested methods and compliance forms as options for residential builders and owners to demonstrate compliance with the requirement to reduce construction waste by 65% or greater.

California Green Building Standards Code (Title 24, Part 11)

Title 24, Part 11, of the CCR (California Green Building Standards Code, or CALGreen) was first adopted in 2008 and made mandatory in 2010. The currently adopted 2022 CALGreen code became effective January 1, 2023. It includes mandatory and voluntary nonresidential standards related to green building that reduce GHG emissions, energy and water consumption, and solid waste and stormwater generation. CALGreen establishes mandatory minimum green building standards and optional, more stringent Tier 1 and Tier 2 provisions. Cities and counties are required by state law to enforce Title 24 but have the discretion to adopt either optional tier as mandatory or to adopt their own stricter standards.

Warren-Alquist Energy Resources Conservation and Development Act of 1974

The CEC regulates energy resources by coordinating and funding energy supply and demand research to reduce the energy consumption rate of growth, through the Warren-Alquist Energy Resources Conservation and Development Act (Warren-Alquist Act) (Government Code Section 25000 et seq.). The CEC is the state's primary energy policy and planning agency. Its responsibilities include forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts or

larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing state response to energy emergencies. CEC develops energy efficiency standards for residential and nonresidential buildings approximately every 3 years. The currently adopted 2022 Building Energy Efficiency Standards became effective January 1, 2023.

REGIONAL AND LOCAL REGULATIONS

Planning for water management, wastewater and stormwater management, and solid waste disposal is conducted by local agencies to support their long-term resource planning and ensure adequate service to meet existing and future demands. In addition to federal and state regulations governing these planning efforts, cities, counties, and water districts may provide regulatory advisement on water resources, water treatment, and solid waste disposal. Many jurisdictions incorporate goals and policies relating to these topic areas in their municipal codes, general plans, development standards, or other regulations (e.g., utility master plans, solid waste management plans).

3.14.3 Impact Analysis

SIGNIFICANCE CRITERIA

The following significance criteria are based on CEQA Guidelines Appendix G, thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which could cause significant environmental effects (Criterion PUF-1);
- have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years (Criterion PUF-2);
- result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments (Criterion PUF-3); or
- generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and comply with federal, State, and local management and reduction statutes and regulations related to solid waste (Criterion PUF-4).

METHOD OF ANALYSIS

As described in Chapter 2, “Project Description,” the regional growth forecast for the Bay Area projects that between 2020 and 2050 the Bay Area will add approximately 1.8 million new residents, 1 million new households (and 1.5 million new housing units), and 1.4 million new jobs. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. The land use growth footprint is derived from the UrbanSim 2.6 land use model and represents the development or redevelopment of parcels of land simulated to accommodate the region’s forecasted growth of households and jobs from 2015 through 2050 through new building(s). Precise building site(s) on the parcels are not known, therefore the land use growth

footprint incorporates the entire parcel. Because of this assumption, the area of potential effects tends to be overstated when considering the land use growth footprint.

This analysis includes a program-level, qualitative assessment of impacts related to water supply, wastewater/stormwater, and solid waste. The assessment of available water supply considers the current regional demand and supply of water based on analyses available in current UWMPs for major water providers (e.g., East Bay Municipal Utilities District, SFPUC, Santa Clara Valley Water District, Sonoma County Water Agency, Marin Municipal Water District). The projections included in the applicable UWMPs inform where additional demand may exceed the capacity of water districts as well as which water districts may have additional capacity. The EIR identifies areas where: 1) there is an existing forecasted shortage in long-term supplies that would need to be met by imported water or additional water conservation, reuse, and recycling; or 2) where the proposed plan projects population or jobs beyond what is assumed in current UWMPs and could result in a potential shortage.

Impacts related to wastewater, stormwater, and solid waste are more localized in nature, and therefore the analysis is qualitative and focuses on the existing regulations, standards, and policy measures to address these localized impacts. Water and wastewater impacts related to implementation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects would be inherently operational in nature, and the following analyses discuss effects of the proposed plan following implementation, which may require construction of new facilities to meet increased demands. Therefore, projected growth construction impacts are not addressed separately from operation impacts in Impacts PUF-1 through PUF-3. The physical effects of future construction are identified here and addressed in more depth in the other EIR technical sections. The baseline for the following analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025. At the time of Notice of Preparation publication, many local agencies had not yet completed or published their 2020 UWMPs. Consequently, for agencies lacking a published 2020 UWMP, this EIR relies on their 2015 UWMP data as the best available official source of supply and demand estimates. However, where 2020 UWMPs were finalized and published in time for EIR preparation, those newer data sets have been integrated into this analysis (e.g., EBMUD 2021; SFPUC 2021; SCVWD 2021a). In the future, project-level CEQA reviews may rely on fully adopted 2020 UWMPs or subsequent UWMP updates.

This evaluation of public utilities and facilities impacts assumes that construction and development under the proposed plan would adhere to applicable federal, state, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts.

IMPACTS AND MITIGATION MEASURES

Impact PUF-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which could cause significant environmental effects (PS)

Land Use Impacts

Construction

Environmental impacts could occur from relocation or construction of water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities necessary to accommodate development associated with the plan's land use footprint. . The construction process could result in environmental impacts related to air quality, greenhouse gas emissions, hazardous

materials, stormwater runoff, cultural and tribal cultural resources, and noise. For a discussion of these impacts see Sections 3.2, “Aesthetics and Visual Resources”; 3.3, “Agriculture and Forestry Resources”; 3.4, “Air Quality”; 3.6, "Climate Change, Greenhouse Gases, and Energy"; 3.9, “Hazards and Wildfire”; 3.10, “Hydrology and Water Quality”; 3.7, “Cultural Resources and Tribal Cultural Resources”; and 3.12, “Noise.”

Construction-related impacts are typically short term and can be mitigated to less than significant through actions of the implementing agency. Future construction of development projects approved by local lead agencies would be subject to local and state regulations for post-construction runoff management requirements. The NPDES permit requirements, described in the Regulatory Setting above, would apply to projects associated with the forecasted development pattern to reduce the discharge of sediments and other pollutants. Such management requirements would include project design including general site design control measures, LID features, treatment control measures, ordinances, and regulations. Implementation of these management requirements would reduce stormwater runoff such that additional stormwater capacity would not be required. Project-level environmental review would also be required for construction of water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities. Typically, improvements are identified in district master plans in advance of the need for expansion, and environmental review would identify project-specific mitigation based on impacts of the expansion project.

As discussed below, the land use growth footprint that would result from implementation of the proposed plan could result in construction of new or expanded stormwater drainage, water, wastewater treatment facilities, electric power, natural gas, and telecommunications infrastructure. However, the utility demand associated with construction is expected to be short-term, intermittent, and relatively minor in scale. As such, implementation of the plan would not require the installation of new utility infrastructure or the relocation of existing utilities during construction. Therefore, impacts related to utilities during construction under the land use growth footprint would be less than significant (LTS).

Operation

The proposed plan’s forecasted development land use growth footprint could result in a need for new or expanded water and wastewater treatment facilities to accommodate demand that exceeds the capacity at existing facilities. Much of the new treatment capacity is likely to be through expansion of existing facilities, because approximately 77% of the proposed plan’s development would occur within land designated as urban built-up (see Chapter 2, “Project Description”) and therefore could connect to existing conveyance and treatment systems. Bay Area water and wastewater agencies are actively exploring the possibility of expanding existing water facilities. For example, the Contra Costa Water District is advancing the Phase 2 expansion of Los Vaqueros Reservoir, which would add roughly 115,000 acre-feet of storage (bringing total capacity to about 275,000 acre-feet In addition, many wastewater agencies are currently implementing capital improvement programs to expand wastewater treatment capacity and build new functionality with water reuse. For instance, the City of San Mateo is implementing Phase 3 of the Wastewater Treatment Plant Upgrade Project to expand their wastewater treatment plant to better handle heavy storm events and produced high-quality treated water (City of San Mateo 2025).

Some wastewater treatment facilities could face challenges expanding their discharge capacity because of pollutant load restrictions in receiving waters. In these instances, wastewater treatment capacity may need to be expanded along with the use of advanced treatment technology, reclaimed water distribution, or groundwater recharge. The expansions and updates to existing wastewater treatment facilities to meet future needs and requirements present opportunities to explore how to use a higher quality water output for beneficial reuse that could help sustain reliability of local water supplies.

The total land use growth footprint identified under the proposed plan would increase the region’s total urban footprint by approximately 8,100 acres. This increase in the region's urban footprint by roughly 1%

over existing conditions would accommodate the approximately 34% increase in the number of regional households forecasted during the horizon of the proposed plan. Development of the remaining acres outside of existing urban areas could be composed of a variety of land uses and impervious surfaces (e.g., paved areas, building rooftops, parking lots) that could result in incremental increases in the volume and rate of stormwater runoff, and possibly require the expansion or construction of new stormwater drainage facilities.

Urban infill can also increase impervious surfaces by converting permeable vacant or underused parcels into land with more paving or structures. Some redevelopment can reduce the amount of impervious surface, however, by converting pavement or buildings into permeable paving or landscape. Redevelopment can also increase the amount and rate of runoff by discharging greater amounts of water on a site than before development, typically because of excessive landscape irrigation. Because most of the plan's Growth Geographies—Priority Development Areas (PDAs), Transit-Rich Areas (TRAs), and High-Resource Areas (HRAs) are already urbanized, most of the land use changes in these areas would be redevelopment, infill, and intensification of existing land uses. Infrastructure upgrades would accommodate the stormwater and water quality treatment needs of the individual development.

The successful and continued implementation of Regional Stormwater Permit Provision C.3 requirements would help mitigate increases in runoff flows from new development and redevelopment projects through post-construction controls such as LID techniques. As required by Provision C.3, new development or redevelopment that creates or replaces 10,000 square feet or more of impervious surfaces must incorporate LID strategies, such as stormwater reuse, onsite infiltration, and evapotranspiration as initial stormwater management strategies. Secondary methods that could be incorporated include the use of natural, landscape-based stormwater treatment measures, as identified by Provision C.3. For a complete discussion of water quality impacts associated with stormwater runoff, see Section 3.10, "Hydrology and Water Quality."

The infill nature of the proposed plan's forecasted development pattern, combined with compliance with existing stormwater regulations that mitigate runoff flows from the use of LID techniques, would result in less-than-significant impacts on the stormwater capacity of existing systems because much of the growth would occur on already impervious land built to lower standards and the slight increase of urbanized land would have to comply with current standards. However, development outside of urbanized areas could require the construction of new stormwater drainage systems.

It is possible that implementation of the proposed plan's land use growth footprint would result in the demand for new energy and telecommunication infrastructure. The specific nature of the infrastructure is difficult to predict because both the energy and telecommunication fields are evolving rapidly with new technologies. In the Bay Area, more than 50 jurisdictions now restrict or prohibit natural-gas hookups in most new buildings which would limit expansion of natural gas infrastructure associated with the proposed plan. As communities continue to implement strategies to electrify their communities and transition to a less carbon intensive electric system, upgrades to existing distribution systems would be expected, as well as increased use of micro infrastructure used at a small neighborhood or even single parcel scale. Where existing electric, natural gas, and telecommunications infrastructure cannot accommodate demand generated from increased land development associated with implementation of the proposed plan, and where the capacity of existing infrastructure is exceeded, new or expanded infrastructure, including electric power, natural gas, and telecommunications may be required. Therefore, this impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction

Construction of sea level rise adaptation projects could have an effect on water treatment demand or wastewater treatment because they could result in increased impermeable surfaces. Construction of

sea-level rise adaptation projects would not generate wastewater such that new or expanded facilities would be required. Adaptation projects that are designed with engineered environmental systems are likely to have no or minimal stormwater impacts. Construction of some "grey" engineered infrastructure like sea walls or levees with roadways or trails on their top surface could increase construction-related stormwater runoff or expand the extent of impervious surfaces. While it is not anticipated that sea level rise adaptation projects would have an effect on wastewater treatment demand or water treatment demand, any increase in the extent of impermeable surfaces could increase stormwater runoff during construction. The utility demand associated with construction of sea level rise adaptation projects is expected to be short-term, intermittent, and relatively minor in scale. As such, utility demand associated with construction of sea level rise adaptation project would not require the installation of new utility infrastructure. However, it may be necessary to relocate existing electrical, natural gas, and telecommunications infrastructure if such facilities are located within the vicinity of sea level rise adaptation infrastructure projects. Therefore, environmental impacts could occur from potential conversion of undeveloped land to accommodate relocated water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities. This would be a potentially significant impact (PS). As noted above, the potential impacts related to construction and land conversion are discussed throughout this DEIR.

Operation

Notably, the implementation of sea level rise adaptation projects under the proposed plan would improve the resiliency of the plan area from inundation from rising seas. Several wastewater treatment facilities such as the San Jose-Santa Clara Regional Wastewater Facility are in low-lying areas that are vulnerable to elevated sea levels, particularly when combined with 100-, 200-, and 500-year storm events, which deposit high volumes of precipitation over short periods while also facilitating storm surge.

For the reasons identified above, while sea level adaptation projects would increase the plan area's resiliency to this climate change impact, it may result in the relocation of stormwater drainage, water, and wastewater treatment facilities and electric power, natural gas, and telecommunications infrastructure, which may have significant impacts. Therefore, this impact would be potentially significant (PS).

Transportation System Impacts

Construction

Construction of transportation projects resulting from implementation of the proposed plan could affect storm-water capacity, and in combined sewer areas, could influence wastewater loading. Specifically, construction could be a source of additional stormwater runoff due to ground disturbance, vegetation removal, and the use of impervious surfaces such as staging areas and access roads. In locations with a combined stormwater and wastewater conveyance system, this temporary increase in runoff could impact wastewater treatment capacity. Regulations exist to mitigate stormwater runoff from transportation projects. A summary of the regulatory mechanisms that would reduce potential adverse impacts to stormwater and wastewater infrastructure is presented in the following paragraphs.

Construction of transportation projects that fall under Caltrans jurisdiction would be covered by the Caltrans NPDES Stormwater Program. As described in the regulatory setting for SWRCB, this NPDES permit regulates all stormwater discharges from Caltrans-owned conveyances, maintenance facilities and construction activities. Caltrans has a Storm Water Management Plan that describes the procedures and practices used to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. Guidance documents have also been developed by Caltrans to implement stormwater BMPs in the design, construction, and maintenance of highway facilities.

Construction of transportation projects where local agencies are the lead agency are subject to local and state regulations for post-construction runoff management requirements. The NPDES permit requirements described in the land use discussion above (project design including general site design control measures, LID features, treatment control measures, ordinances, and regulations) also apply to transportation impacts to reduce the discharge of sediments and other pollutants.

Overall, while existing regulations would minimize stormwater-related effects, Caltrans-specific requirements apply only to projects within Caltrans right-of-way, whereas locally sponsored projects must satisfy the Bay Area Municipal Regional Stormwater (MS4) Permit's Provision C.3 requirements. While the construction of new roadway lane miles in areas lacking adequate stormwater drainage capacity could necessitate temporary localized drainage improvements, such upgrades would be incorporated into project design to comply with existing applicable regulatory requirements. As a result, the potential temporary stormwater capacity impacts related to construction of transportation improvements from implementation of the proposed plan would be less than significant (LTS).

Operation

The electrification of the transportation fleet as well as the increased use of communication systems for transportation could result in the need for new or realigned electric and telecommunication infrastructure. It may be necessary to relocate existing electrical, natural gas, and telecommunications infrastructure if such facilities are located within the vicinity of a transportation project. Environmental impacts could occur from the potential conversion of undeveloped land to accommodate new or relocated electrical, natural gas, and telecommunications infrastructure. As noted above, the potential impacts related to land conversion are discussed throughout this EIR.

Development of new roadway projects as part of the proposed plan could create new impervious areas by converting existing permeable surfaces into impervious surfaces through the expansion of existing roadways and construction of new traffic lanes. The proposed plan would add approximately 130 freeway lane miles, 10 freeway ramp miles, 50 expressway lane miles, and approximately 10 collector lane miles in the region. It would also remove approximately 80 arterial lane miles. Overall, the proposed plan would add approximately 130 lane miles (1% increase over existing conditions) (see Chapter 2, "Project Description"). Any projects undertaken by Caltrans, or by a third party operating within its stormwater system, are subject to its Stormwater Management Plan which regulates discharges from Caltrans stormwater conveyances.

Transit projects may also increase impervious surfaces if new bus stops or supporting interchanges expand the right of way footprint. Notably, some rail systems are below ground (e.g., Bay Area Rapid Transit's [BART's] underground lines), use existing roadways and train tracks (e.g., light rail, cable cars, street cars), or are elevated (e.g., BART's aboveground lines), and introduce only minimal additional impervious surface area compared to new roadway projects. Additionally, some at-grade rail lines may be largely permeable.

Overall, regulations applying to transportation projects would minimize stormwater-related effects, but Caltrans' storm-water permit would apply only within Caltrans right-of-way. Locally sponsored roadway projects must instead meet the Bay Area Municipal Regional Stormwater (MS4) Permit (Provision C.3) or equivalent county MS4 requirements. In locations where new lane-miles are added and existing drainage capacity is limited, expanded systems may still be necessary. As a result, the potential stormwater capacity impacts related to transportation improvements from implementation of the proposed plan would be potentially significant (PS).

Conclusion

Potential impacts on water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities would occur primarily from implementation of the plan's forecasted development pattern. Impacts from transportation projects would most commonly be expected to occur where they discharge to a combined stormwater and wastewater conveyance system or where new lane-miles exceed local storm-drain capacity. Additionally, implementation of the proposed plan may require new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities or the relocation of existing facilities. While construction impacts of the forecasted development pattern, sea level rise adaptation projects, and transportation projects would be less than significant because the utility demand associated with construction is expected to be short-term, intermittent, and relatively minor in scale, operation of the plan may result in the need for increased utility infrastructure. Therefore, these impacts would be **potentially significant (PS**). Mitigation Measures PUF-1(a) through PUF-1(f) address these impacts and are described below.

Mitigation Measures

Mitigation Measure PUF-1(a) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- For projects that could increase demand on water and wastewater treatment facilities, coordinate with the relevant service provider to ensure that the existing public services and utilities could accommodate the increase in demand. If the current infrastructure servicing the project site is found to be inadequate, infrastructure improvements for the appropriate public service or utility shall be identified in each project's CEQA documentation. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities.

Mitigation Measure PUF-1(b) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- During the design and CEQA review of individual future projects, determine whether sufficient stormwater drainage facilities exist for a proposed project. These CEQA determinations must ensure that the proposed development can be served by its existing or planned drainage capacity. If adequate stormwater drainage facilities do not exist, project sponsors shall coordinate with the appropriate utility and service provider to ensure that adequate facilities could accommodate the increased demand, and if not, infrastructure and facility improvements shall be identified in each project's CEQA determination. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities.
- For projects of greater than 1 acre in size, reduce stormwater runoff caused by construction by implementing stormwater control best practices, based on those required for a SWPPP.
- Model and implement a stormwater management plan or site design that prevents the post-development peak discharge rate and quantity from exceeding pre-development rates.

Mitigation Measure PUF-1(c) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below (or equally effective measures):

- For transportation projects, incorporate stormwater control, retention, and infiltration features, such as detention basins, bioswales, vegetated median strips, and permeable paving, early into the design process to ensure that adequate acreage and elevation contours are planned.

Mitigation Measure PUF-1(d) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below, (or equally effective measures):

- For transportation projects implemented by Caltrans or subject to Caltrans review, adhere to Caltrans' Stormwater Management Plan, which includes best practices to reduce the volume of stormwater runoff and pollutants in the design, construction, and maintenance of highway facilities.

Mitigation Measure PUF-1(e) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those identified below or equally effective measures):

- Consider the use of on site electric generation and storage systems that produce all or a portion of the energy used by a land use, sea level rise adaptation, or transportation project.

Mitigation Measure PUF-1(f) Implementing agencies and/or project sponsors shall implement, where feasible and as applicable based on project- and site-specific considerations, the mitigation measures described throughout this EIR to address the effects related to the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, including:

- Mitigation Measures AES-1 through AES-4
- Mitigation Measures AGF-1 through AGF-3
- Mitigation Measures AQ-2 through AQ-4
- Mitigation Measures BIO-1 through BIO-3 and BIO-5
- Mitigation Measures GHG-1 and GHG-3
- Mitigation Measures CUL/TCR-1, CUL/TCR-2, and CUL/TCR-4
- Mitigation Measure GEO-7
- Mitigation Measures HAZ-4, HAZ-6 and HAZ-7
- Mitigation Measures LU-1
- Mitigation Measures NOISE-1 through NOISE-4
- Mitigation Measures PSR-1 and PSR-2
- Mitigation Measures PUF-2 through PUF-4
- Mitigation Measure TRA-2

Significance after Mitigation

Implementation of Mitigation Measure PUF-1(a) would reduce impacts associated with exceeding existing water and wastewater treatment capacity because application of such mitigation would require that land use and transportation projects comply with project-level CEQA review and identify infrastructure improvements to ensure adequate capacity. Implementation of Mitigation Measures PUF-1(b), PUF-1(c), and PUF-1(d) would reduce impacts associated with exceedances of existing stormwater drainage capacity because application of such mitigation would require that land use, sea level rise adaptation, and transportation projects comply with project-level CEQA review, incorporate on-site stormwater control practices, and develop and implement stormwater management plans or stormwater control design features. Additionally, as stated above, implementation of Mitigation Measures PUF-2(a), PUF-2(b), and PUF-2(c), summarized under Impact PUF-2, and Mitigation Measure PUF-3, summarized under Impact PUF-3, would lower water demand and wastewater generation, thus reducing the potential need

for facilities. Implementation of Mitigation Measure PUF-1(f) would mitigate impacts related to the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities and to conversion of undeveloped land to accommodate new or expanded facilities. Projects taking advantage of the CEQA streamlining provisions of SB 375 (Public Resources Code PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, it cannot be concluded with certainty that all impacts related to this potential construction and land conversion would be mitigated to less than significant. Therefore, there may be instances where the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities would cause **significant and unavoidable (SU)** environmental effects.

Impact PUF-2: Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years (SU)

Land Use Impacts

Operation

Under the proposed plan, growth would be concentrated in established urban areas that already have existing development and are served by established water providers. These providers have long-range planning documents, such as UWMPs, that account for projected demand under normal, dry, and multiple dry year scenarios. As shown in **Table 3.14-2**, the major water suppliers in the region are projected to be able to supply adequate water for their projected service populations through 2040 during normal years, apart from a few smaller agencies that only publish near-term projections (e.g., through 2035) in their most recent UWMPs. Most 2020 UWMPs project water demand and supply through at least 2045, consistent with state requirements. The ability to provide adequate water supply for many districts is dependent on successful achievement of water conservation targets and the completion of supply expansion projects, such as new water contracts, land acquisition, groundwater recharge, and reclaimed water distribution. In some areas, such as the City and County of San Francisco and the Santa Clara Valley, adequate supply through 2040 depends on substantial water conservation efforts. In San Francisco, the ability for supply projects to move forward depends on multiple factors such as environmental review, permitting requirements, public acceptance, and the availability of funding. Water suppliers are pursuing the water conservation targets set by the state under SB X7-7 (2009) and regularly updating their UWMPs. Future development projects would be required to comply with Water Code Sections 10910–10915, as described above in the Regulatory Setting, under "Water Supply Assessment and Water Supply Verification." The enforcement of these regulations by local jurisdictions would ensure that a water supply assessment is prepared to demonstrate that sufficient water would be available to serve development projects before their approval.

As shown in **Table 3.14-3**, major water supply agencies such as Alameda County Water District, Valley Water (Santa Clara Valley Water District), Solano County Water Agency, and Sonoma County Water Agency expect demand to exceed supply during a single dry year by 2045. In addition, Alameda County Water District, East Bay Municipal Utility District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, and Solano County Water Agency expect demand to exceed supply during multiple dry years before 2045. Therefore, in localized parts of the region, there is an existing forecasted shortage in long-term supplies during a single dry year and multiple dry years that will need to be met through additional water conservation, reuse, and recycling, and additional water supply sources.

The combined population projections (approximately 9.9 million) of the water supply agencies for 2045 (the latest common projection year) exceed the proposed plan's regional population projection of approximately 8.9 million in 2045, growing to approximately 9.6 million by 2050. San José, served by Valley Water, projects 2045 as the earliest year wherein a water shortage may occur during a single dry year. San

Francisco, served by SFPUC, does not project water shortages during a single dry year in their UWMP that runs through 2040, largely because of supplies from reservoir storage, but does project water shortages by 2040 in the event of multiple dry years. With implementation of the proposed plan, projected growth would not occur evenly around the region. Therefore, the proposed plan could result in population or job growth beyond what is assumed in current UWMPs and could result in a localized water supply shortage. As discussed in Section 3.14-1, "Environmental Setting," eight of the region's water agencies are working together to consider new approaches to drought contingencies and together produced a Drought Contingency Plan that included 15 potential drought mitigation measures including new interties between systems, expanded storage, as well as new treatment options for water reuse (Brown and Caldwell 2017).

Locally, as shown in **Tables 3.14-2 and 3.14-3**, land development through 2045 served by the Contra Costa Water District, East Bay Municipal Utility District, Marin Municipal Water District, and SFPUC would have adequate water supplies in both regular and single dry years. The City of Napa and Zone 7 Water Agency also project adequate water supplies in regular and single dry years through 2045, their current UWMP projection. Contra Costa Water District, Marin Municipal Water District, Sonoma Water, City of Napa, and Zone 7 would also have adequate water supplies in multiple dry years. However, at a regional level, changes in land use projected development from the proposed plan may result in insufficient water supplies requiring the acquisition of additional water sources and the imposition of conservation requirements. Further, as discussed in the "Drought" subsection in Section 3.14-1, "Environmental Setting," California, including the plan area, may face future water supply challenges associated with climate change-related periods of drought. The uncertainty of water supply availability is furthered by the plan's 2050 horizon being 5 to 15 years further than water agencies' 2015 and 2020 UWMPs, which have a planning horizon of 2035 or 2045. The increase in population-, household-, and jobs-related demand on water supply coupled with potentially reoccurring drought conditions may result in insufficient water supply to serve the plan area. For these reasons, these impacts would be potentially significant (PS).

Sea-Level Rise Adaptation Impacts

Construction and Operation

The construction and maintenance of sea level rise adaptation projects could increase the demand for water. Construction activities such as dust control and operational activities such as landscape irrigation could increase water demand. Although these increases in demand are anticipated to be small on a per project basis, the collective demand from all the sea level rise adaptation projects taken together could increase water demand that exceeds an applicable water supply agency's projected demand and supply. Because sea level rise adaptation projects constructed under the proposed plan may be in areas with constrained water supplies, especially during a dry year or extended drought period, these impacts would be potentially significant (PS).

Transportation System Impacts

Construction and Operation

The construction of new roadway capacity, bicycle and pedestrian facilities, transit facilities; maintenance of existing transportation facilities; and operation of new and existing facilities could increase water demand for construction activities such as concrete mixing or dust control and operational activities such as landscape irrigation, and restrooms, and drinking fountains. The individual water demands associated with transportation projects are small, and the combined regional volume is negligible compared to the overall municipal demand. Construction and operational activities (e.g., dust control and landscape irrigation) associated with the transportation projects could also use non-potable waters supplies, which could reduce the demand for potable-water. However, transportation projects under the proposed plan may be constructed in locations with constrained water supplies, especially during a dry year or prolonged drought period. Therefore, these impacts would be potentially significant (PS).

Conclusion

The land use growth footprint that would result from implementation of the proposed plan would generate most of the water demand resulting from accommodation of the regional growth forecast. While the permanent demand on potable water supplies required by sea level rise adaptation projects and transportation projects would be relatively small compared to the total demand associated with construction and operation of land use projects, the collective demand could result in water demand that exceeds an applicable water agency's projected demand and supply. Additionally, the construction phase of a sea level rise adaptation project or transportation project (water for mixing concrete, watering down topsoil, initial irrigation needs) could exceed local water supplies on a temporary basis, especially during dry years or prolonged drought periods. It is also possible that a transportation project that features significant landscaping that is not drought-resistant could significantly impact local water supplies over a longer term. Because the construction and operation of land use, sea level rise adaptation projects, and transportation projects under the proposed plan could generate water demands that surpass water supplies, which could require the acquisition of additional water sources and the imposition of conservation requirements, these impacts would be **potentially significant (PS)**. Mitigation Measures PUF-2(a), PUF-2(b), and PUF-2(c) address these impacts and are described below.

Mitigation Measures

Mitigation Measure PUF-2(a) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- For projects that could increase demand for water, coordinate with the relevant water service provider to ensure that the provider has adequate supplies to accommodate the increase in demand. This can and should be documented in the form of an SB 610 Water Supply Assessment, where applicable; an SB 221 Water Supply Verification; or other capacity analysis.
- Implement water conservation measures which result in reduced demand for potable water. This could include reducing the use of potable water for landscape irrigation (such as through drought-tolerant plantings, water-efficient irrigation systems, the capture and use of rainwater) and the use of water-conserving fixtures (such as dual-flush toilets, waterless urinals, reduced flow faucets).
- Coordinate with the water provider to identify an appropriate water consumption budget for the size and type of project and designing and operating the project accordingly.
- For projects located in an area with existing reclaimed water conveyance infrastructure and excess reclaimed water capacity, use reclaimed water for non-potable uses, especially landscape irrigation. For projects in a location planned for future reclaimed water service, projects should install dual plumbing systems in anticipation of future use. Large developments could treat wastewater onsite to tertiary standards and use it for non-potable uses onsite.
- Where applicable, apply Tier 1 or Tier 2 CALGreen standards as mandatory local requirements, which reduce water use by 12% and 20%, respectively, and require additional qualifying elective actions.

Mitigation Measure PUF-2(b) Implementing agencies and/or project sponsors shall require the construction phase of transportation projects to connect to reclaimed water distribution systems for non-potable water needs, when feasible based on project- and site-specific considerations.

Mitigation Measure PUF-2(c) Implementing agencies and/or project sponsors shall require transportation projects with landscaping to use drought-resistant plantings or connect to reclaimed water distribution systems for irrigation and other non-potable water needs when available and feasible based on project- and site-specific considerations.

Significance after Mitigation

Implementation of Mitigation Measures PUF-2(a), PUF-2(b), and PUF-2(c) would reduce impacts associated with water supply because they would require that land use, sea level rise adaptation, and transportation project sponsors coordinate with water suppliers to ensure adequate water supplies exist or comply with project-level CEQA review and incorporate on-site water conservation approaches, water budgeting, and incorporation of recycled water for non-potable use. Projects taking advantage of the CEQA streamlining provisions of SB 375 (Public Resources Code PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, it cannot be concluded with certainty that all impacts related to water supply would be mitigated to a less-than-significant. Therefore, this impact would remain **significant and unavoidable (SU)**.

Impact PUF-3: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments (PS)

Land Use Impacts

Operation

Increased volumes of wastewater from forecasted growth under the proposed plan could exceed the wastewater treatment capacity of individual treatment facilities, if not properly planned. Generation of additional wastewater as a result of forecasted development would depend on the location of projected development and would not be spread evenly across each treatment facility system. Generally, capacity planning is undertaken in advance of need. Funding for new and expanded facilities is typically provided through developer impact fees, and through the rates customers pay for treatment. Building occupancy is prohibited if wastewater service is not available. Therefore, regional exceedance of the capacity of a wastewater treatment plant is not expected.

Furthermore, wastewater generation per capita is expected to decline by 2050 relative to baseline conditions because of implementation of regional- and statewide water conservation measures. Additionally, wastewater generation per capita will likely be reduced in future years as municipalities in the Bay Area adopt new versions of Part 11 of the Title 24 California Building Code (California Green Building Standards or CALGreen) which will require new development to incorporate low-flow, water-efficient appliances, and design. However, wastewater is not conveyed between different treatment agencies (this would require construction of an extensive network of major pipelines). One wastewater facility could approach its treatment capacity and require expansion, whereas other plants in the region may have substantial available capacity. This is a localized issue, therefore, and potential local impacts are discussed below.

Under the proposed plan, population and job growth would be concentrated in areas of existing development. Overall, population in the Bay Area is projected to grow by approximately 24% from 2020 to 2050. With implementation of the proposed plan, Santa Clara, San Francisco, San Mateo, and Alameda Counties are projected to grow households by more than the regionwide rate, while all others would grow less. Areas with the most growth also are most likely to need additional wastewater treatment capacity. Therefore, the counties that would support the highest percentage of growth would also be the locations where treatment plant expansion is most likely. The City of San Mateo broke ground on a project to upgrade their 1935 wastewater treatment plant in 2020 to bring the facility up to a higher standard and expand capacity. Phase 3 of the project is expected to complete in 2026 (City of San Mateo 2025).

It is likely that some treatment facilities would need to expand their capacity before 2050 to meet expected population growth, or to respond to RWQCB requirements to provide capacity to receive their NPDES

permit. Because the changes to forecasted development pattern under the proposed plan may result in insufficient wastewater treatment capacity, these impacts would be potentially significant (PS).

Sea-Level Rise Adaptation Impacts

Construction and Operation

Sea-level rise adaptation projects would not affect wastewater treatment capacity. Instead, sea level rise adaptation projects would help protect existing wastewater treatment facilities from future sea level rise and in some cases may become components of the wastewater treatment process. Because sea level rise adaptation projects would not generate significant wastewater, these impacts would be less than significant (LTS).

Transportation System Impacts

Construction and Operation

Implementation of transportation projects would not directly increase sanitary wastewater generation from forecasted growth. As noted in Impact HYDRO-4, the design of transportation projects that would have the potential to alter drainage patterns would conform to local stormwater drainage master plans and regional MS4 permit requirements. This could increase capacity in combined stormwater and wastewater conveyance systems. Transportation projects for which local agencies are the lead agency are subject to local and State regulations for construction and non-construction runoff prevention. The regional MS4 NPDES permit described above would also apply to transportation projects. Transportation projects would be required to incorporate BMPs and LID stormwater management principles. In addition, any enhancements or modifications to California state highways would be required to follow Caltrans guidelines, which include the preparation of a hydraulic study and submittal of a hydraulics study report for any project intercepting a waterway or encroaching upon a floodplain, to assess the potential impacts on natural processes and beneficial uses as part of the environmental review. These existing regulatory requirements address the potential for impacts on drainage patterns and rates.

In accordance with federal, State, and local stormwater management regulations, new construction must maintain pre-project hydrology. Because transportation projects would comply with these requirements, implementation of the proposed plan would not be expected to alter existing drainage patterns in a manner that would result in runoff that exceeds the capacity of existing or planned stormwater drainage systems or results in flooding. Therefore, impacts associated with the implementation of the proposed plan's transportation projects would be less than significant (LTS).

Conclusion

The land use growth footprint that would result from implementation of the proposed plan could result in potential impacts on wastewater treatment capacity. Because of the relatively small permanent generation of wastewater by transportation projects, and because projects would comply with federal, state, and local stormwater management regulations to maintain pre-project hydrology, transportation projects would not contribute to a significant impact. Similar to transportation projects, sea level rise adaptation projects are unlikely to contribute to a significant impact. Nonetheless, because new projected growth under the proposed plan could generate new volumes of wastewater that could contribute to a wastewater treatment facility meeting or exceeding its existing capacity, this impact would be **potentially significant (PS)**. Mitigation Measure PUF-3 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure PUF-3 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- During the design and CEQA review of individual future projects, determine whether sufficient wastewater treatment capacity exists for a proposed project. These CEQA determinations must ensure that the proposed development can be served by its existing or planned treatment capacity. If adequate capacity does not exist, project sponsors shall coordinate with the relevant service provider to ensure that adequate public services and utilities could accommodate the increased demand, and if not, infrastructure improvements for the appropriate public service or utility shall be identified in each project's CEQA documentation. The relevant public service provider or utility shall be responsible for undertaking project-level review as necessary to provide CEQA clearance for new facilities.
- Require compliance with Mitigation Measure PUF-2(a), and MTC shall require implementation of Mitigation Measures PUF-2(b) and PUF-2(c), as feasible based on project- and site-specific considerations to reduce water usage and, subsequently, some wastewater flows.

Significance after Mitigation

Implementation of Mitigation Measure PUF-3 would reduce impacts related to exceedance of existing wastewater capacity because application of this mitigation would require that land use projects comply with project-level CEQA review and incorporate on-site water conservation approaches, water budgeting, and incorporation of recycled water for non-potable use as mandated by Mitigation Measures PUF-2(b), PUF-2(c), and PUF-3 listed above, which would reduce the generation of wastewater. To the extent that an implementing agency requires an individual project to implement all feasible mitigation measures described above, the impact would be less than significant with mitigation (LTS-M).

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact PUF-4: Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals, and comply with federal, State, and local management and reduction statutes and regulations related to solid waste (PS)

Land Use Impacts

Construction

The 2022 CALGreen code contains construction waste management requirements for certain new construction and additions, as well as demolition of nonresidential (i.e., state-owned buildings and commercial, industrial, and medical facilities) and residential buildings. Effective starting January 1, 2023, the construction activities must adhere to the at least 65% diversion standard and submit a construction waste management plan or contract with a waste management company that submits verifiable documentation. Newly constructed multifamily housing with five or more than units are required to have accessible areas that serve the entire building and are identified for the depositing, storage, and collection of recycling. Projected development under the proposed plan would be subject to the standards defined in the 2022 CALGreen code, as well as any future updates.

Because Countywide Integrated Waste Management Plans must demonstrate a remaining landfill disposal capacity of at least 15 years to serve all the jurisdictions in the county, landfill capacities are updated on a continuing basis to identify insufficient capacity. Future growth in the region may require the expansion of existing facilities or construction of new landfills, the identification of waste disposal

capacity outside of the region, and/or larger reductions in solid waste generation or diversion rates to serve the projected level of development.

There are also multiple additional laws intended to reduce solid waste in California, including AB 1826 (organic waste recycling) and SB 1383 (statewide 75% organic-waste diversion and edible-food recovery requirements), which sought to greatly reduce the amount of organic material deposited into landfills by further mandating waste recycling services for organic material. At the beginning of 2016, local jurisdictions were required under AB 1826 to implement an organic waste recycling program and measure and monitor their efforts. Since January 1, 2022, SB 1383 regulations have imposed statewide organic-waste diversion and edible-food-recovery mandates that build on AB 1826. Section 5.408, "Construction Waste Reduction, Disposal and Recycling," of the 2022 CALGreen code requires all new construction and demolition projects to develop a construction waste management plan that documents how a minimum of 65% of nonhazardous construction and demolition waste will be recycled or salvaged. The construction-related impact would be less than significant (LTS).

Operation

The existing population and employment uses in the region will continue to generate solid waste that requires disposal in a licensed and regulated landfill. The expected growth in the region's population, which is expected to increase by 1.8 million from 7.8 million in 2020 to roughly 9.6 million by 2050, under the proposed plan, which would result in an increase in solid waste production. CalRecycle estimates that the statewide per capita disposal rate was 6.3 pounds per person per day in 2022 (CalRecycle 2024b). Assuming an average diversion (to recycling) rate of 50%, as required by AB 939, the region's solid waste generation would increase from approximately 11,069 tons of solid waste per day and 4.0 million tons per year, to approximately 13,900 tons per day and 5.1 million tons per year by 2050. Further, if California meets its goal of achieving the 75% diversion rate initiatives set by SB 1383 and AB 341, future rates of disposal would be 6,950 tons per day and 2.5 million tons per year in 2050. While the State of California is not on track to meet this goal, some Bay Area jurisdictions like the City and County of San Francisco are meeting the goal. San Francisco has achieved the 75% target since 2009 (City and County of San Francisco 2021).

Landfill closure dates typically reflect the year a landfill is projected to reach capacity and take many factors into account, including rates of solid waste generation, rates of diversion, and projected growth. All but five (i.e., Altamont Landfill and Resource Recovery, Vasco Road Sanitary Landfill, Redwood Landfill, USS-Poscoe Industries Waste Management Unit II, and Kirby Canyon Recycling and Disposal Facility) of the fourteen landfills active in the region, listed in **Table 3.14-5**, have an estimated closure date on or before the year 2050 (CalRecycle 2024a). It is unlikely these three remaining landfills, which make up around 35% of the region's existing remaining capacity, could accommodate the solid waste disposal needs of the entire region.

Land use projects carried out as part of the proposed plan's implementation would be required to comply with federal, state, and local statues and regulations related to solid waste, including county and city general plans. Local jurisdictions also have goals and policies for recycling and diversion of solid waste to ensure compliance, see AB 939 and SB 341 in Section 3.14.2, "Regulatory Setting." Local governments submit an annual report to CalRecycle on the implementation of waste diversion plans to comply with their respective per capita disposal targets. CalRecycle reviews each local government's progress in implementing its unique diversion program and progress in sustaining or achieving compliance. CalRecycle may refer some local governments for a compliance evaluation review, although the number of local governments referred is generally less than 1%. If a more thorough analysis reveals a jurisdiction is not meeting the "good faith" standard for implementing its diversion programs or for reaching per capita disposal targets, CalRecycle will issue a compliance order. If the jurisdiction fails to fulfill its implementation plan to correct the program deficiencies, then the jurisdiction will be subject to penalties.

As noted above, there are also multiple additional laws intended to reduce solid waste in California, including AB 1826, which sought to greatly reduce the amount of organic material deposited into landfills by further mandating waste recycling services for organic material. At the beginning of 2016, local jurisdictions were required under AB 1826 to implement an organic waste recycling program and measure and monitor their efforts.

While there are regulations in place intended to reduce solid waste in California, implementation of the proposed plan's would concentrate growth in areas of existing development and projected growth would not occur evenly around the region. Areas with the most growth could generate waste that could exceed the current permitted capacity at local landfills. Therefore, this impact would be potentially significant (PS).

Sea Level Rise Adaptation Impacts

Construction and Operation

Sea level rise adaptation projects construction and maintenance in the proposed plan have the potential to generate a substantial amount of solid waste during construction. This waste can come from typical construction activities, such as grading, excavation, and removal of existing structures. The amount of this waste is difficult to predict, but it could result in an exceedance of local landfill capacities for construction of sea level rise adaptation projects in the future closer to expected closure dates of the landfills. Operation of sea level rise adaptation projects are unlikely to produce substantial solid waste, if any. Nevertheless, construction would still generate a notable volume of solid waste. Therefore, these impacts would be potentially significant (PS).

Transportation System Impacts

Construction and Operation

Roadway and transit construction and maintenance projects in the proposed plan have the potential to generate a substantial amount of solid waste during construction. This waste can come from typical construction activities, such as grading, excavation, and removal of existing structures. The operation of transportation facilities may also generate solid waste. The amount of this waste is difficult to predict, but it could result in an exceedance of local landfill capacities for transportation projects constructed in the future closer to expected closure dates of the landfills. Transportation projects under the proposed plan would be required to comply with AB 341 and SB 1383, as well as the additional laws cited above which would further reduce anticipated solid waste generation. Nevertheless, construction of these projects would still generate a notable volume of solid waste that could exceed the capacity of local landfills. Therefore, these impacts would be potentially significant (PS).

Conclusion

Implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects has the potential to reduce the capacity of existing landfills, leading to earlier closure dates than currently anticipated and a need for increased landfill capacity. This impact is considered **potentially significant (PS)**. Mitigation Measure PUF-4 addresses this impact and is described below.

Mitigation Measures

Mitigation Measure PUF-4 Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, that include those (or equally effective measures) identified below:

- Provide an easily accessible area that is dedicated to the collection and storage of non-hazardous recycling materials.

- Maintain or reuse existing building structures and materials during building renovations and redevelopment.
- Use salvaged, refurbished, or reused materials to help divert such items from landfills.
- Divert construction waste from landfills, where feasible, through means such as:
  - submitting and implementing a construction waste management plan that identifies materials to be diverted from disposal;
  - establishing diversion targets, possibly with different targets for different types and scales of development; and
  - helping developments share information on available materials with one another, to aid in the transfer and use of salvaged materials.
- Apply the specifications developed by the Construction Materials Recycling Association (CMRA) to assist contractors and developers in diverting materials from construction and demolition projects, where feasible (CalRecycle 2006).

Significance after Mitigation

Implementation of Mitigation Measure PUF-4 would reduce impacts associated with solid waste generation because it would require that land use and transportation projects apply landfill diversion approaches including re-using building materials, maintaining structures where applicable, developing construction waste management plans, and using guidance from CMRA. Projects taking advantage of the CEQA streamlining provisions of SB 375 (Public Resources Code PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. However, it cannot be concluded with certainty that all impacts related to solid waste would be mitigated to a less-than-significant level. Therefore, this impact would remain **significant and unavoidable (SU)**.

3.15 TRANSPORTATION

This section describes the current transportation conditions and examines the effects of implementation of the proposed plan's forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects, and transportation projects on transportation conditions in 2050. The study area consists of the existing and proposed elements of the transportation system for the nine-county Bay Area, including highways, local roads, rail, bus and ferry transit, bicycle and pedestrian facilities, and airports and seaports. This section evaluates the impacts related to transportation including conflicts with applicable plans and policies, hazards, changes in vehicle miles traveled (VMT) per capita, and emergency vehicle access that may result from the implementation of the proposed plan.

Comments received in response to the Notice of Preparation expressed concerns around the travel demand analysis (see Section 3.15.3, "Impact Analysis"); multimodal transportation planning (see Section 3.15.3, "Impact Analysis"); and consideration and coordination with other plans and studies (see Section 3.14.2, "Regulatory Setting," and Section 3.15.3, "Impact Analysis").

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important." (CEQA Guidelines Section 15083) Neither the CEQA Guidelines nor Statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of impact analysis in this section. Appendix B includes all Notice of Preparation comments received.

3.15.1 Environmental Setting

EXISTING REGIONAL TRANSPORTATION CONDITIONS

The Bay Area features a robust transportation network, allowing for multimodal access across the region. The transportation system includes interstate and State highways, local arterial roadways, local streets and roads, public transit systems, bicycle and pedestrian facilities, seaports, and airports. In combination, these facilities allow for the movement of people and goods throughout the region. The various elements of the Bay Area transportation system are described below using the most recent data readily available from public sources or using transportation outputs from the regional travel model for existing conditions (2023 as the year with best available data).

Roadway network: The Bay Area currently contains over 650 miles of limited-access highways, which include both interstates and State highways (Caltrans 2024). These facilities provide access to major employment centers and to destinations outside the Bay Area. In addition to providing mobility for automobiles, these facilities also support express bus services and freight movement. The major limited-access highways in the Bay Area are listed in **Table 3.15-1**. In addition, the Bay Area has over 20,000 miles of arterials, collectors, and local streets, providing access to communities and accommodating on-street parking and loading activities. In 2023, the total daily vehicle miles of travel in the nine-county Bay Area was reported to be approximately 150 million (Caltrans 2024). The road network also serves nearly 660,000 vehicles that travel into or out of the region from adjacent areas every day (MTC and ABAG 2021). **Figure 3.15-1** depicts the major roadway facilities in the Bay Area.

Table 3.15-1: Major Limited-Access Highways in the Bay Area

Route	Highway Limits		Bay Area Counties Served
Interstate 80	San Francisco	Teaneck, NJ	SF, ALA, CC, NAP, SOL
Interstate 280	San Francisco	San Jose	SF, SM, SCL
Interstate 380	San Bruno	South San Francisco	SM
Interstate 580	San Rafael	Tracy	MRN, CC, ALA
Interstate 680	Fairfield	San Jose	SOL, CC, ALA, SCL
Interstate 780	Vallejo	Benicia	SOL
Interstate 880	Oakland	San Jose	ALA, SCL
Interstate 980	Oakland	Oakland	ALA
Interstate 238	San Leandro	Castro Valley	ALA
Interstate 505	Dunnigan	Vacaville	SOL
US Route 101	Olympia, WA	Los Angeles	SON, MRN, SF, SM, SCL
State Route 1	Leggett	Dana Point	SON, MRN, SF, SM
State Route 4	Hercules	Markleeville	CC
State Route 12	Sebastopol	San Andreas	SON, NAP, SOL
State Route 17	San Jose	Santa Cruz	SCL
State Route 24	Oakland	Walnut Creek	ALA, CC
State Route 29	Upper Lake	Vallejo	NAP, SOL
State Route 37	Novato	Vallejo	MRN, SON, NAP, SOL
State Route 85	Mountain View	San Jose	SCL
State Route 87	San Jose	San Jose	SCL
State Route 92	Half Moon Bay	Hayward	SM, ALA
State Route 160	Sacramento	Antioch	SOL, CC
State Route 237	Mountain View	Milpitas	SCL
State Route 242	Concord	Concord	CC

Notes: Highway limits reflect the overall route limits, rather than the limits of the limited-access segment. County abbreviations used: ALA (Alameda), CC (Contra Costa), Marin (MRN), NAP (Napa), San Francisco (SF), San Mateo (SM), Santa Clara (SCL), Solano (SOL), and SON (Sonoma).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Public transit systems: The Bay Area public transit system includes a combination of heavy rail (e.g., BART), light rail (e.g., Muni Metro and Santa Clara Valley Transportation Authority [VTA] Light Rail), commuter rail (e.g., Caltrain and ACE), diesel and electric buses, cable cars, and ferries. This public transit system accommodates a total of over 0.9 million passengers a day, with about 48% of daily passengers (421,000) on Muni, about 19% of daily passengers (166,000) on BART, 13% (111,000) on AC Transit, and 9% (76,000) on VTA (**Table 3.15-2**). **Figure 3.15-2** shows the areas served by each of the Bay Area transit operators. A list of the public transit operators and average weekday ridership is shown in **Table 3.15-2**.

Amtrak provides long-distance passenger rail services to the Bay Area via the Capitol Corridor, San Joaquin, Coast Starlight, and California Zephyr lines, connecting the region to the Central Valley, Southern California, the Pacific Northwest, and the Midwest.

Figure 3.15-1: Major Road Facilities



Sources: TomTom North America 2019, 2023; MTC 2024, Caltrans, BART, San Francisco Municipal Transportation Agency, Santa Clara Valley Transport Authority.

Table 3.15-2: Public Transit Operators in the Bay Area

Transit System	Mode	Average Weekday Ridership	Bay Area Counties Served
SFMTA	Local/express bus; Light rail; Cable car/streetcar/trolley	421,000	MRN, **SF**, SM
BART	Heavy rail	166,000	ALA, CC, SCL, SF, SM
AC Transit	Local/transbay bus	111,000	**ALA, CC**, SCL, SF, SM
VTA	Local/express bus; Light rail	76,000	ALA, **SCL**, SM
Caltrain	Commuter rail	22,000	SCL, SF, SM
SamTrans	Local/express bus	28,000	SCL, SF, **SM**
Golden Gate Transit	Local/express bus; Ferry	7,000	**MRN**, SF, **SON**
County Connection	Local/express bus	9,000	ALA, **CC**
Marin Transit	Local bus	8,000	MRN
WETA	Ferry	6,000	ALA, CC, SF, SM, SOL
Tri Delta Transit	Local/express bus	4,000	CC
Santa Rosa CityBus	Local bus	4,000	SON
LAVTA Wheels	Local/express bus	4,000	**ALA**, CC
ACE	Commuter rail	2,000	ALA, SCL
SolTrans	Local/express bus	3,000	CC, **SOL**
WestCAT	Local bus; Express/transbay bus	2,000	**CC**, SF
VINE	Local/express bus	2,000	**NAP**, SOL
Sonoma County Transit	Local/express bus	2,000	SON
FAST	Local/express bus	1,000	CC, **SOL**
SMART	Commuter rail	2,000	MRN, SON
Vacaville City Coach	Local bus	NA	SOL
Petaluma Transit	Local bus	1,000	SON
Union City Transit	Local bus	NA	ALA
Dixon Readi-Ride	Local bus	NA	SOL
Rio Vista Delta Breeze	Local/express bus	NA	CC, **SOL**
Pleasanton Paratransit	Local bus	NA	CC

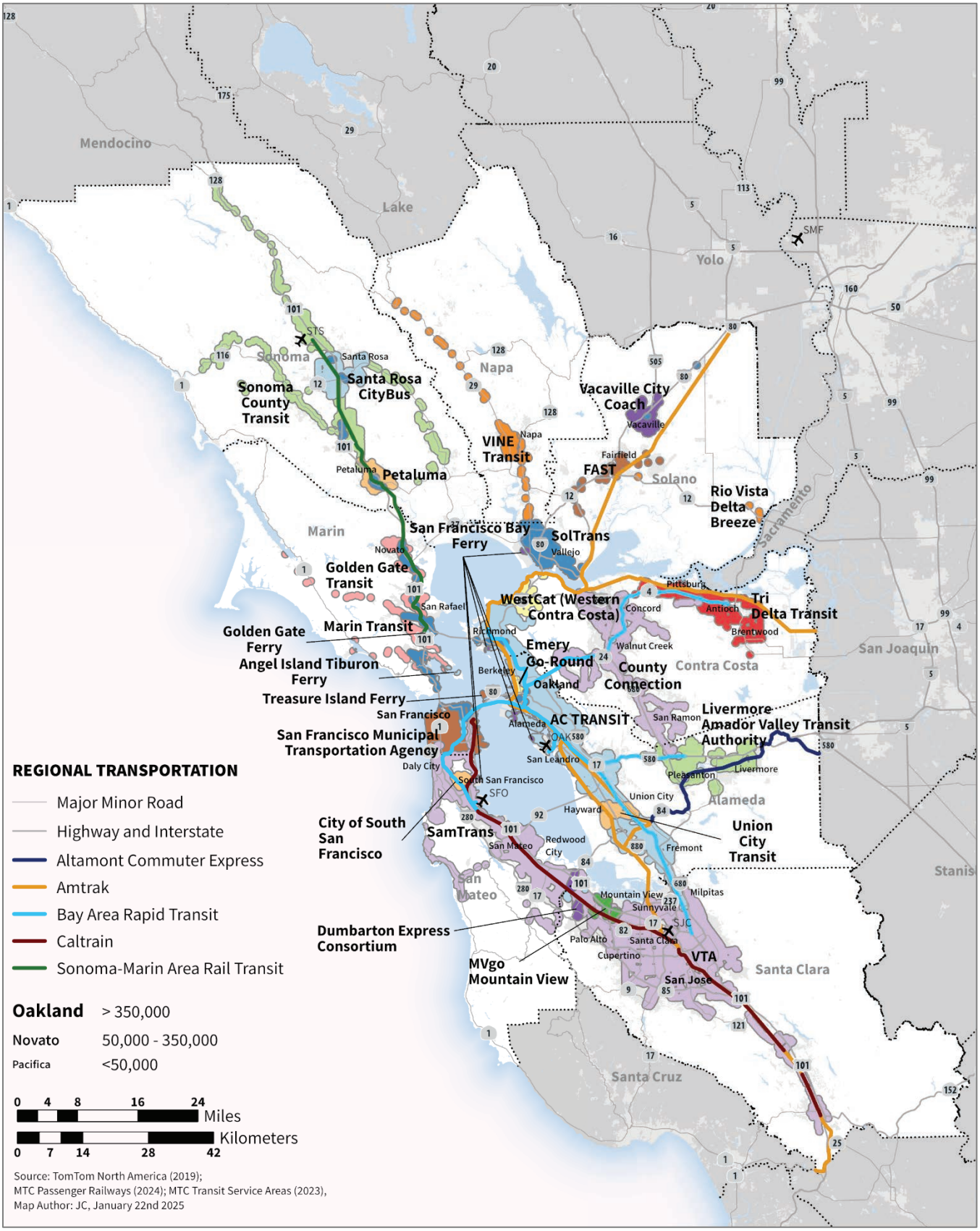
Notes: Average weekday ridership has been rounded to the nearest 1,000. Figures may not sum due to independent rounding. Average weekday ridership is calculated by taking the total annual ridership and dividing by 300, an assumption which is consistent with MTC travel modeling procedure. Primary counties served by operator are marked in bold. County abbreviations used: ALA (Alameda), CC (Contra Costa), Marin (MRN), NAP (Napa), San Francisco (SF), San Mateo (SM), Santa Clara (SCL), Solano (SOL), and SON (Sonoma).

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

California High-Speed Rail service is planned to begin revenue operations during the timeframe of the proposed plan. Within the Bay Area region, the High-Speed Rail stations will provide development opportunities in the existing downtown cores of San Francisco, Millbrae, San Jose, and Gilroy.

Private transit: In addition to public transit systems and operators, private transit options have expanded over recent years in the Bay Area. Private transit services include privately operated commuter shuttles (e.g., Apple, Google, Genentech) and publicly accessible private shuttles (e.g., Emery Go-Round, San Francisco Mission Bay Shuttles, Stanford University Marguerite).

Figure 3.15-2: Transit Lines and Areas Served by Transit



Sources: TomTom North America 2019; MTC Passenger Railways 2024; MTC Transit Service Areas 2023.

Emerging transportation technology: New transportation technologies can have an important influence on regional and national transportation systems, and some have already started to change long-standing transportation behaviors. Companies like Waymo, Cruise, Zoox, and Nuro are actively testing and operating self-driving vehicles within the Bay Area. Tesla now offers Full Self-Driving (FSD) capabilities, and Tensor recently released the Tensor Robocar, the first fully autonomous car for purchase.

Transportation innovations include the following: on-demand ridesharing; bike-sharing; powered scooter-sharing; connected and autonomous vehicles; mobility aggregation applications that provide users with one source for mobility services (e.g., Moovel, CityMapper, Transit); transportation network companies (TNCs) (i.e., Lyft, Uber); coordinated and adaptive traffic signals; active traffic management, which provides the ability to dynamically manage traffic through use of strategies such as adaptive ramp metering and adaptive traffic signal control; and unmanned aircraft systems. These and other emerging technologies have the potential to transform mobility choices and alter the transportation landscape. For example, the expansion of TNC use and the deployment of autonomous vehicles could introduce zero-passenger vehicle miles as a significant source of car travel on roadways. The aggregate, long-term effect these technologies will have on the transportation system is uncertain and will be shaped by regulations and policies surrounding their use.

Bicycle and pedestrian facilities: The Bay Area has an extensive system of pedestrian facilities, including multiuse paths, sidewalks, crosswalks, walkways, stairs, and ramps. Other pedestrian facilities include pedestrian signals, pedestrian refuge islands and medians, and curb extensions.

In addition to pedestrian facilities, the Bay Area has a bikeway network consisting of four classes of bikeways, defined in the *Highway Design Manual* (Caltrans 2020), as follows:

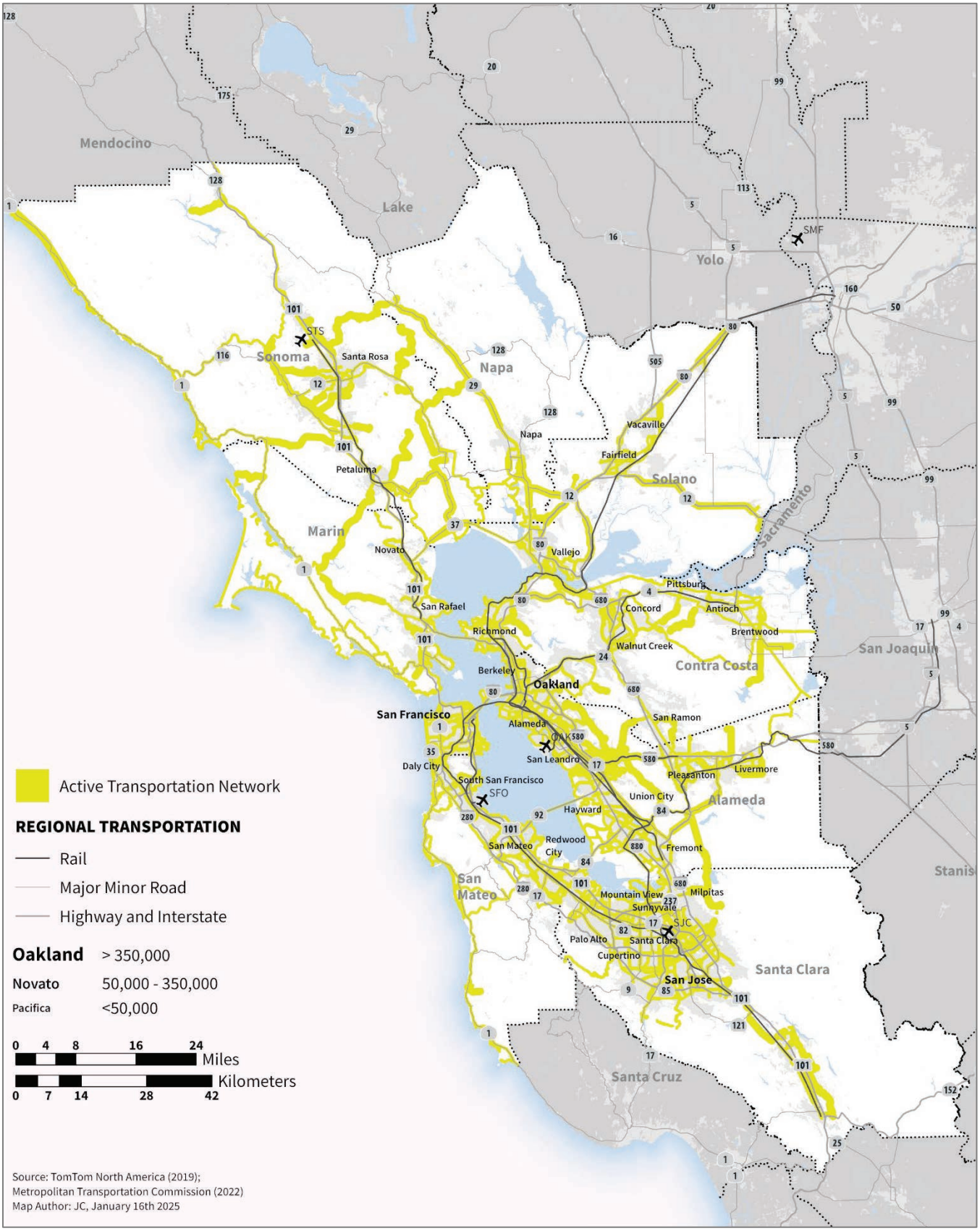
- Class I Bikeway (Bike Path): completely separated right-of-way for exclusive use of bicycles and pedestrians,
- Class II Bikeway (Bike Lane): dedicated lane for bicycle travel on a street or highway,
- Class III Bikeway (Bike Route): shared lane for bicycle travel on a street or highway, and
- Class IV Bikeway (Separated Bikeway/Cycle Track): separated or protected lane for bicycle travel on a street or highway.

Figure 3.15-3 shows the locations of various bikeways through the Bay Area.

MTC's Regional Active Transportation Plan (AT Plan), updated in 2023, identifies a Regional Active Transportation Network of over 3,244 miles of paths and roadways, of which 992 miles are built, 1,680 miles are planned, and 572 miles are of unknown status. The regional AT Plan includes a 5-Year Implementation Plan that commits MTC to a build-out of 1,966 miles of All Ages and Abilities facilities by 2035. The AT Plan sets specific active transportation goals to increase usage of bicycles, scooters, and skateboards, including those with electric assistance; identifies regional infrastructure gaps to be closed; updates MTC's Complete Streets Policy; and identifies funding scenarios to help achieve the AT Plan's goals.

Seaports and airports: The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to trucks and railcars. The Port of Oakland, the largest of the five seaports in the Bay Area, is the third largest US seaport on the West Coast (after the Ports of Los Angeles and Long Beach) (DOT 2024). Other seaports include the Port of San Francisco, the Port of Richmond, the Port of Benicia, and the Port of Redwood City. These seaports are supported by freight railroad services operated by Union Pacific and Burlington Northern Santa Fe.

Figure 3.15-3: Bay Area Active Transportation (Bicycle) Facilities



Sources: TomTom North America 2019; MTC 2022.

The Bay Area is also served by three international airports: San Francisco International Airport, Oakland International Airport, and Norman Y. Mineta San Jose International Airport. Each of these airports provides mobility for people and freight nationally and internationally. The region is also served by one smaller airport with limited commercial service, Charles M. Schulz Sonoma County Airport, as well as numerous smaller general aviation airports.

Goods movement: Goods movement supports global supply chains and regional industries that trade in international, domestic, and local markets. The types of goods moved, how the goods are moved, and where they are moved between is a function of regional economic activity and what transportation options are available. The movement of goods in the Bay Area region involves intermodal systems of air cargo, maritime, rail, and roadways. Efficient goods movement requires access and connectivity to logistics centers and terminals to ensure movement onto and off the network. The regional goods movement infrastructure includes the country's eighth-busiest container port (Port of Oakland) by inbound ton equivalent unit (TEU), two of the most active air cargo airports (San Francisco International Airport and Oakland International Airport), major rail lines and terminals operated by Union Pacific and Burlington Northern Santa Fe Railway, and highways that carry high volumes of trucks (DOT 2024; MTC 2016a).

California Department of Transportation (Caltrans) District 4 led the *San Francisco Bay Area Freight Mobility Study* in 2014, which provides detailed information regarding the region's multimodal goods movement system. The Alameda County Transportation Commission and MTC developed a long-range *Goods Movement Plan* (February 2016), and MTC has produced the *San Francisco Bay Area Goods Movement Plan* (February 2016b). MTC also partnered with the planning agencies for the Sacramento area, San Joaquin County, and the Monterey Bay area to study goods movement across the broader economic cluster and recommend strategies to support the mega-region in the *Northern California Mega-Region Goods Movement Study* (MTC 2019). Additionally, MTC formed the Regional Freight New Technologies Task Force in September 2015 and studied freight strategies to develop the *Freight Emissions Reduction Action Plan* (March 2017).

TRANSPORTATION PERFORMANCE MEASURES

Regional conditions for a number of performance measures form the basis for the transportation impact analysis presented in this EIR. These measures include daily VMT and VMT per capita, mode share, and daily vehicle trips. These performance measures are described and summarized in more detail in this section. The existing conditions analysis in this EIR refers to conditions modeled in the baseline year 2023. MTC used its regional travel demand model (Travel Model 1.6) to compare the proposed plan for 2050 conditions to the 2023 baseline conditions.

Regional travel patterns: The Bay Area transportation system includes infrastructure supporting travel by numerous modes and routes for the movement of people and goods. **Table 3.15-3** provides some key metrics regarding Bay Area travel behavior in 2023 based on the simulation results from the travel model.

Table 3.15-3: Modeled Bay Area Travel Behavior (2023)

Daily Trips	
Commute Trips	6,674,000
Non-Commute Trips	18,190,000
Total Daily Trips	24,864,000
Daily Vehicle Trips	20,044,000
Daily VMT	146,877,000
Daily VMT per Capita	19.7

Daily Trips	
Daily Vehicle Hours of Recurring Delay	210,000
Daily Transit Boardings	1,042,000
Daily Transit Passenger Miles	6,150,000

Notes: VMT = vehicle miles traveled. Figures may not sum due to independent rounding; daily metrics are measures for a typical weekday. Vehicle trips reflect interzonal trips assigned directly to the network and include intraregional and commercial vehicle trips. Population statistics reflect the total Bay Area population able to travel on the region's transport network and do not include immobile, involuntary populations, such as people who are incarcerated.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Vehicle Miles Traveled

The basic measure of the amount of vehicle travel generated is VMT. One vehicle traveling 1 mile constitutes 1 vehicle mile, regardless of its size, fuel type, or the number of passengers. VMT is a term used throughout this EIR and refers to the number of VMT within the region (or a specified geographic area) during a typical weekday and includes VMT for all trip types (commute, shopping, social/recreational, school, goods movement). The VMT reported in this EIR reflects the mileage accrued within the nine-county Bay Area region and not necessarily all VMT created by the residents of the region (for example, it would not include the VMT generated by a Bay Area resident driving in Los Angeles or Stockton). However, the VMT reported for the nine-county regional area includes the vast majority of VMT generated by Bay Area residents and employees. A portion of the regional VMT can be accrued by through (or interregional) trips. VMT is a common measure of roadway use and economic activity and has a strong correlation with congestion and emissions.

An area's per capita (or per person) VMT as applied in this EIR is the total VMT divided by the population of that area and is a measure of the average vehicle miles each person travels on a typical weekday. Per capita VMT tends to increase as a result of greater overall economic activity in the region, higher levels of per-household automobile ownership, and a jobs-housing imbalance that contributes to longer average commute distances.

As shown in **Table 3.15-3**, the region experiences 147 million VMT on a typical weekday in the 2023 base year, or 19.7 VMT per capita.

Mode Share and Daily Trips

Of the trips made by Bay Area residents, the MTC travel model estimates that 27% are for work, 13% for college or school, and 15% for shopping, as shown below in **Table 3.15-4**. The average one-way commute trip for the region is approximately 10 miles and takes 19 minutes, as shown in **Table 3.15-5**. The average one-way transit commute trip is just above the regional average distance, but takes more than double the regional average time.

Table 3.15-4: Modeled Typical Weekday Daily Person Trips by Purpose (2023)

Purpose	Trips	Percent of Total
Commute	6,674,000	27%
Shopping	3,777,000	15%
School	2,676,000	11%
Escort (pickup/drop-off passengers)	2,367,000	10%
At Work	1,511,000	6%
Eat Out	1,240,000	5%
Social/Recreational	900,500	4%

Purpose	Trips	Percent of Total
College	503,900	2%
Other	5,215,000	21%
Non-Commute Subtotal	18,190,000	73%
Regional Total	24,864,000	100%

Notes: Whole numbers have been rounded (between 1,000 and 1,000,000 to the nearest 100 and over 1,000,000 to the nearest 1,000).
Figures may not sum due to independent rounding; metrics are measures for a typical weekday.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 3.15-5: Modeled Average One-Way Commute Trip by Mode (2023)

Purpose	Average Commute Distance (miles)	Average Commute Time (minutes)
Auto	10.3	18.1
Walk	0.8	16.6
Transit	10.8	44.9
Bicycle	2.4	12.1
Regional Average	9.7	19.1

Note: Metrics are measures for a typical weekday.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

According to US Census Bureau data, Bay Area residents use a variety of transportation modes to get to their workplaces, as shown in **Table 3.15-6**. While nearly two in three Bay Area residents drive alone to get to work on a typical day, 7% of residents rely on public transit, and 4% either walk or bike to work.

Over the past three decades, the share of workers driving alone to work has decreased at the regional level, remaining at around 68% between 1990 and 2010, with dropping by 10 percentage points to 58% in 2023. Carpooling has decreased in popularity in the Bay Area over the past decade compared to other commute options, declining from 13% in 1990 to 10% in 2023. Transit mode share has decreased by 3 percentage points, from 10% to 7%, while bicycling to work has remained steady at 1%. In contrast, working from home has risen significantly from 3% to 19%.

Table 3.15-6: Bay Area Resident Workers Categorized by Means of Transportation to Work (1990–2023)

Year	1990 Number (Percent of Total)	2000 Number (Percent of Total)	2010 Number (Percent of Total)	2015 Number (Percent of Total)	2020 Number (Percent of Total)	2023 Number (Percent of Total)
Drive Alone	2,105,000 (68%)	2,248,000 (68%)	2,243,000 (68%)	2,417,000 (66%)	2,380,000 (62%)	2,220,000 (58%)
Carpool	400,000 (13%)	427,000 (13%)	354,000 (11%)	372,000 (10%)	373,000 (10%)	366,000 (10%)
Transit	294,000 (10%)	321,000 (10%)	333,000 (10%)	446,000 (12%)	431,000 (11%)	272,000 (7%)
Walk	112,000 (4%)	106,000 (3%)	112,000 (3%)	132,000 (4%)	139,000 (4%)	128,000 (3%)
Bike	32,000 (1%)	36,000 (1%)	50,000 (2%)	69,000 (2%)	59,000 (2%)	57,000 (1%)
Other	37,000 (1%)	36,000 (1%)	35,000 (1%)	34,000 (1%)	41,000 (1%)	48,000 (1%)
Work from Home[1]	105,000 (3%)	133,000 (4%)	194,000 (6%)	208,000 (6%)	394,000 (10%)	706,000 (19%)
Total Workers	3,086,000 (100%)	3,306,000 (100%)	3,321,000 (100%)	3,698,000 (100%)	3,845,000 (100%)	3,814,000 (100%)

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, over 1,000,000 to the nearest 1,000).
[1] US Census defines this as individuals who primarily work from home, or home-based workers. This includes those who work exclusively at home or those who work at home part of the time.
Sources: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

3.15.2 Regulatory Setting

FEDERAL REGULATIONS

Infrastructure Investment and Jobs Act

The Infrastructure Investment and Jobs Act (IIJA) replaced the Fixing America's Surface Transportation (FAST) Act. It is a 5-year federal funding bill that was signed into law in November 2021 and authorizes over $560 billion in total transportation funding. The IIJA expands the scope of consideration of the metropolitan planning process to include consideration of climate change, including construction of electric vehicle charging infrastructure, funding for public transit, and planning for transportation resilience; consideration of equity in funding for public transit, improvements to station accessibility, and reconnecting communities that have been cut off from economic opportunity by transportation infrastructure; consideration of safety in programs that improve the safety of people and vehicle in our transportation system by reducing roadway crashes and fatalities (California Senate Office of Research 2021).

Metropolitan Planning General Requirements

The US Department of Transportation requires that metropolitan planning organizations (MPOs), such as MTC, prepare long-range RTPs and update them every 4 years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. RTPs are prepared by regional agencies to identify a 20-year vision for transportation priorities and investments, establish regional goals, identify present and future needs, deficiencies, and constraints, analyze potential solutions, estimate available funding, and propose investments. Key federal requirements described in Title 23 CFR 134 and California Transportation Commission (CTC) guidelines for long-range plans include the following (CTC 2024):

- RTPs must be developed through an open and inclusive process that ensures public input; seeks out and considers the needs of those traditionally under served by existing transportation systems; and consults with resource agencies to ensure potential problems are discovered early in the RTP planning process;
- RTPs must be developed for a period of not less than 20 years into the future;
- RTPs must reflect the most recent assumptions for population, travel, land use, congestion, employment, and economic activity;
- RTPs must have a financially constrained element, transportation revenue assumptions must be reasonable, and the long-range financial estimate must take into account construction-related inflation costs;
- RTPs must include a description of the performance measures and performance targets used in assessing the performance of the transportation system;
- RTPs must include a system performance report evaluating the condition and performance of the system with respect to performance targets adopted by the State that detail progress over time;
- RTPs may include multiple scenarios for consideration and evaluation relative to the State performance targets as well as locally developed measures;
- RTPs must conform to the applicable federal air quality plan, called the State Implementation Plan (SIP), for ozone and other pollutants for which an area is not in attainment; and

- RTPs must consider planning factors and strategies in the local context.

The IIJA requires MPOs to provide affordable housing organizations an opportunity to comment on the RTP. In addition, MPOs serving a Transportation Management Area may develop a housing coordination plan that includes projects and strategies that may be considered in the RTP (CTC 2024).

STATE REGULATIONS

California Transportation Plan

The California Transportation Plan is prepared by Caltrans every 5 years to provide a long-range policy framework to meet the State's future mobility needs and reduce greenhouse gas (GHG) emissions to goals set by the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) and implementing legislation Senate Bill (SB) 375 (discussed in this section). The most recent California Transportation Plan was adopted in 2021 (Caltrans 2021). The California Transportation Plan defines goals, performance-based policies, and strategies to achieve the State's collective vision for California's future statewide. The California Transportation Plan is developed in collaboration with transportation stakeholders, such as MTC. Through ongoing engagement, the California Transportation Plan is intended to provide goals and visions to support a fully integrated, multimodal, sustainable transportation system that supports the quality of life, prosperous economy, human and environmental health, and social equity.

California Transportation Commission Regional Transportation Plan Guidelines

California law relating to the development of the RTPs is primarily reflected in Government Code Section 65080. State requirements for long-range transportation plans are similar to the federal regulations. However, key additional requirements described in Government Code Section 65080 include:

- compliance with CEQA,
- consistency with State Transportation Improvement Program,
- use of program-level performance measures that include goals and objectives,
- inclusion of a policy element, an action element, and a financial element, and
- inclusion of a SCS for MPOs (see SB 375 discussion below).

Pursuant to Government Code Section 65080(d), MPOs, such as MTC, that are located in nonattainment and monitoring areas for transportation-air quality must update their RTPs at least every 4 years. If the current RTP is determined to be adequate such that an update is not warranted, the MPO may readopt the current RTP.

Under Government Code Section 14522, the CTC is authorized to prepare guidelines to assist in the preparation of RTPs. The CTC's RTP guidelines suggest that projections used in the development of an RTP should be based upon available data (such as from the Bureau of the Census), use acceptable forecasting methodologies, and be consistent with the Department of Finance baseline projections for the region. The guidelines further state that the RTP should identify and discuss any differences between the agency projections and those of the Department of Finance. The most recent and applicable guidelines are the 2024 RTP Guidelines for MPOs (CTC 2024).

Climate Action Plan for Transportation Infrastructure

The Climate Action Plan for Transportation Infrastructure was adopted on July 12, 2021, and updated in January 2025 (CalSTA 2025). The Climate Action Plan for Transportation Infrastructure details how the State recommends investing billions of discretionary transportation dollars annually to aggressively combat and adapt to climate change while supporting public health, safety, and equity. The 2021 Climate

Action Plan for Transportation Infrastructure was built on executive orders signed by Governor Gavin Newsom in 2019 and 2020 targeted at reducing GHG emissions in transportation, which account for more than 40% of all emissions, to reach the State's ambitious climate goals. The 2025 update includes new strategies and actions to further implement the existing investment framework (CalSTA 2025).

Director's Policy 37

Caltrans Director's Policy 37 (DP 37) recognizes that walking, biking, transit, and passenger rail are integral to a vision of delivering a brighter future for all through a world-class transportation network. Accordingly, all transportation projects funded or overseen by Caltrans will provide comfortable, convenient, and connected Complete Streets facilities for people walking, biking, and taking transit or passenger rail unless an exception is documented and approved. This policy establishes Caltrans's organizational priority to encourage and maximize walking, biking, transit, and passenger rail as a strategy to not only meet State climate, health, equity, and environmental goals but also to foster socially and economically vibrant, thriving, and resilient communities.

Senate Bill 375

The Sustainable Communities and Climate Protection Act of 2008 (Chapter 728, Statues of 2008) (SB 375) has diversified the areas of study from past RTPs to include land use impacts and climate change issues. Specifically, SB 375 requires MPOs to prepare an SCS that demonstrates how the region will meet its GHG reduction targets through integrated land use, housing, and transportation planning. The SCS must identify a transportation network that, when integrated with the forecasted development pattern for the plan area, will reduce GHG emissions from automobiles and light trucks in accordance with targets set by the California Air Resources Board (CARB). See Section 3.6, "Climate Change, Greenhouse Gases, and Energy," for a more in-depth discussion of SB 375 and its implications for the proposed plan. In 2018, CARB revised the previously established per capita passenger vehicle GHG emission reduction targets for MPOs across the State. The Bay Area's revised reduction targets were set as 10% per capita by 2020 and 19% per capita by 2035 (CARB 2018). In 2022 CARB released *The Updated Final Staff Report to the Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, which expressed that to meet the statewide reduction goals set forth by SB 32, the State would need to reduce per capita GHG emissions by 25% by 2035, resulting in a 6% gap between the 19% emissions reductions targets set for the regions (averaged for the 18 MPOs and compared to a baseline year of 2005). The State expects to achieve the remaining reductions through additional State-level policies and measures.

Under SB 375, some development and transportation projects assumed as a part of the proposed plan may be eligible to use a streamlined version of the environmental review process. Among other criteria, these projects must be consistent with the land use designation, density, intensity, and policies of the most recent version of Plan Bay Area, and fall within the identified criteria for development and transportation projects.

Senate Bill 226

CEQA Streamlining for Infill Projects (SB 226) sets forth a streamlined review process for infill projects and includes performance standards that will be used to determine an infill project's eligibility for streamlined review. The purpose of SB 226 and updated CEQA Guidelines Section 15183.3 is to streamline the environmental review process by "limiting the topics subject to review at the project level where the effects of infill development have been addressed in a planning level decision or by uniformly applicable development policies." Residential, commercial and retail, public office buildings, transit stations, and schools are eligible for this streamlining provided they (1) are located in an urban area on a site that has been previously developed or adjoins existing qualified urban uses on at least 75% of the site's perimeter; (2) satisfy the performance standards provided in Appendix M [of the CEQA Guidelines]; and (3) are

consistent with the general land use designation, density, building intensity, and applicable policies specified for the project area in either a SCS or an alternative planning strategy, with some exceptions.

Under SB 226, some development and transportation projects assumed as a part of the proposed plan may be eligible to use a streamlined version of the environmental review process. Among other criteria, these projects must be consistent with the land use designation, density, intensity, and policies of the most recent version of Plan Bay Area, and fall within the identified criteria for development and transportation projects.

Senate Bill 743

SB 743 (2013) changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact. (See PRC Section 21099[b][2]: "automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to [CEQA].")

Under SB 743, Office of Land Use and Climate Innovation (LCI), formerly known as the Governor's Office of Planning and Research (OPR), established VMT as the preferred metric for measuring transportation impacts of most projects in place of vehicle level of service (LOS) or related measures of congestion as the primary metric. The use of VMT for determining significance of transportation impacts has become commonplace since the certification of this provision, and the release of LCI's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) in December 2018 and, as of July 1, 2020, is the required metric statewide.

For land use projects, SB 743 provides opportunities to streamline transportation analysis under CEQA for qualifying urban infill development near major transit stops in metropolitan regions statewide. The legislation established a new CEQA exemption for a residential, mixed-use, or employment center project if it is (1) proposed in a transit priority area or TPA (i.e., an area within one-half mile of a major transit stop that is existing or planned); (2) consistent with a specific plan for which an EIR was certified; and (3) consistent with the use, intensity, and policies of an SCS or Alternative Planning Strategy that is certified by CARB as meeting its GHG reduction targets. This exemption requires further review if the project or circumstances change substantially. Additionally, the legislation establishes that aesthetic and parking impacts of these projects are not considered significant impacts on the environment.

SB 743 can also significantly affect the review of transportation projects under CEQA. Some projects, such as expanding facilities for bicycle, pedestrian, or transit-only use, will not result in negative transportation impacts because they are assumed not to significantly increase automobile trips. However, for roadway capacity projects, the CEQA Guidelines (Section 15064.3) give lead agencies some discretion over what metric is used to evaluate transportation impacts because some roadway expansion projects can induce vehicle travel. If using a metric besides VMT, however, the change in vehicle travel should still be reported. A program-level assessment of roadway projects in a regional plan may also be used to streamline project-level analysis (LCI 2018, formerly OPR).

Caltrans has provided two guidance documents to address VMT impacts on the State highway system consistent with the requirements of SB 743 and the LCI Technical Advisory:

- The Transportation Analysis under CEQA (TAC) provides information to support CEQA practitioners in making CEQA significance determinations for transportation impacts of projects on the State highway system. These could include land use projects or transportation projects.
- The Transportation Analysis Framework (TAF) guides the preferred approach for analyzing the VMT attributable to proposed projects (induced travel) in various project settings, with particular focus on the

analysis of induced travel associated with transportation projects that would add road capacity to the transportation system.

Senate Bill 1339 and Senate Bill 1128

SB 1339 authorized the Bay Area Air District (formerly the Bay Area Air Quality Management District [BAAQMD]) and MTC to adopt and implement a regional commuter benefits ordinance on a pilot basis. The Bay Area Air District and MTC adopted the Bay Area Commuter Benefits Program, which requires Bay Area employers with 50 or more full-time employees in the Bay Area to offer commute benefits with the goal of reducing single-occupant vehicle commute trips, traffic congestion, and vehicle emissions. Under this program, large employers offer commuter benefits to their employees, such as pretax contributions toward public transit passes or commute shuttle services. SB 1128 authorized the Bay Area Air District and MTC to make the Bay Area Commuter Benefits Program permanent.

Assembly Bill 1358

AB 1358, also known as the Complete Streets Bill, amended the California Government Code Section 65302 to require that all major revisions to a city's or county's circulation element include provisions for accommodation of all roadway users, including bicyclists and pedestrians.

California Bicycle Transportation Act

The California Bicycle Transportation Act (1994) requires all cities and counties to have an adopted bicycle master plan to apply for Bicycle Transportation Account funding source.

Senate Bill 1014

The Clean Miles Standard and Incentive Program (SB 1014) requires the California Public Utilities Commission and CARB to establish and implement GHG emission reduction targets and goals for TNCs. As of October 2022, TNCs with annual VMT over 5 million in a calendar year are required to develop GHG emission reduction plans, with targets and goals starting in 2023 and an ultimate goal of 0 grams of CO_2 emissions per VMT by 2030 (CARB 2022). TNCs are able to comply with the rule through any combination of electrification, reduction of miles without passengers, increased ridesharing, and optional credits.

REGIONAL AND LOCAL REGULATIONS

Congestion Management Agency Transportation Plans

Each of the nine Bay Area counties has a congestion management agency (CMA) designated to manage traffic congestion through implementation of multimodal transportation projects. These agencies work with MTC to advance road, bicycle, pedestrian, and transit projects in line with regional objectives. In addition, many CMAs develop county transportation plans that should be consistent with the RTP adopted by MTC. MTC has developed guidelines to be used in the preparation of countywide transportation plans (CTPs). MTC published the *Guidelines for Countywide Transportation Plans* in November 2022. The intent of the guidelines is to inform the relationship between the CTP and RTP/SCS, assist implementation of SB 375 and IIJA, and identify appropriate content to include in the development of the CTP. Many of the CMAs are currently in the process of updating their countywide plans. The most recent CTPs are listed below.

- Alameda County Transportation Commission: *2026 Countywide Transportation Plan* (update in progress),
- Contra Costa Transportation Authority: *Countywide Comprehensive Transportation Plan* (update in progress),
- Transportation Authority of Marin: Getting Around Marin – Strategic Vision Plan (updated 2017),
- Transportation Authority of Marin: Marin Countywide Transportation Plan 2050 (adopted 2024),

- Napa Valley Transportation Authority: *Advancing Mobility 2045* (adopted May 2021),
- San Francisco County Transportation Authority: *San Francisco Transportation Plan 2050* (adopted December 2022),
- City/County Association of Governments of San Mateo County: *San Mateo Countywide Transportation Plan 2040* (update in progress),
- Santa Clara Valley Transportation Authority: *Valley Transportation Plan 2050* (update in progress),
- Solano Transportation Authority: *Solano Comprehensive Transportation Plan 2040* (update in progress, anticipated completion in 2026), and
- Sonoma County Transportation Authority: *Comprehensive Transportation Plan: Moving Forward 2050* (update in progress).

City and County General Plans

State law requires cities and counties to adopt general plans, which must include a transportation, or circulation, element and a land use element. The circulation and land use elements must correlate such that each must address changes in the other. The circulation element describes the existing and proposed transportation facilities and must "plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan" (Government Code Section 65302). Local circulation elements should reflect the RTP/SCS to be consistent with regional GHG reductions and ensure access to transportation funds (LCI 2017). This EIR does not examine consistency with the general plans of jurisdictions in the Bay Area; rather, it addresses issues of overall system performance from a regional perspective.

City and County Modal Plans

City- and countywide bicycle and pedestrian master plans, active transportation plans, freight/goods movement plans, and other mode-specific plans serve as policy documents to guide the development and maintenance of the transportation network, support facilities, and non-infrastructure programs. These plans describe the acceptable operating standards, levels of service, facility classifications, and mode-specific goals and policies of a given city or county.

3.15.3 Impact Analysis

SIGNIFICANCE CRITERIA

Significance criteria are based on CEQA Guidelines Appendix G, LCI's Technical Advisory (December 2018), thresholds used in the EIR for the Plan Bay Area 2050, and professional judgment. Under these criteria, implementation of the proposed plan would have a potentially significant adverse impact if it would:

- conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities (Criterion TRA-1);
- conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) (Criterion TRA-2);
- substantially increase hazards due to geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (Criterion TRA-3); or
- result in inadequate emergency access (Criterion TRA-4).

METHOD OF ANALYSIS

This program-level EIR evaluates potential transportation impacts based on the location of the proposed plan's footprint associated with the forecasted development pattern (i.e., the land use growth footprint), sea level rise adaptation projects (i.e., sea level rise adaptation projects footprint), and transportation projects (i.e., transportation projects footprint). The baseline for this analysis reflects existing conditions when the EIR Notice of Preparation was released in January 2025. However, impacts relying on analysis from Travel Model 1.6 (e.g., VMT), reflect existing conditions as 2023 because it is the most recent year for which comprehensive land use, demographic, transit ridership, and traffic volumes are available for the Bay Area region.

This evaluation of transportation impacts assumes that construction and development under the proposed plan would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Where existing regulatory requirements or permitting requirements exist that are law and binding on responsible agencies and project sponsors, it is reasonable to assume that they would be implemented, thereby reducing impacts.

Vehicle Miles Traveled

Changes in VMT for this analysis are based on travel forecasts developed using the MTC travel demand forecasting model, known as Travel Model 1.6, which is integrated with the regional land use forecasting model, known as Bay Area UrbanSim 2.6 (BAUS 2.6), to produce forecasts of travel behavior and vehicle activity (see Section 2.3.3, "Analysis Tools," in Chapter 2 for more detail).

Travel Model 1.6 considers numerous factors that influence travel behavior and vehicle activity in the region, which in turn affect the roadway network assignment, including:

- demographic factors—age, income, household size, number of workers;
- population, household, and employment forecasts;
- land use growth footprint—density, intensity, mix of uses, distance to transit;
- transportation costs—gas prices, vehicle maintenance costs, bridge and freeway tolls, parking fees, and transit fares;
- travel characteristics of adjacent regions—including the amount and extent of external, or interregional, and through travel;
- geographic features and topography—such as bodies of water, hills, and valleys; and
- transportation systems characteristics—including number of lane miles and posted speed, transit service schedules and station locations.

The integrated model framework of BAUS 2.6 and Travel Model 1.6 address short- and long-run induced travel demand. For example, short-run induced travel demand can be caused by a new transportation facility creating additional capacity, thus inducing new trips due to shortened travel times to destinations in the months or years after construction. Long-run induced demand can be caused by residential and employment location changes as a result of transportation investments, such as a new rail station inducing development of new office buildings in the vicinity over a period of years or decades. Major transportation projects are implemented in Travel Model 1.6 on top of the region's existing transportation system, resulting in changes to accessibility. The change in accessibility affects short-run induced travel, which is accounted for in Travel Model 1.6 through changes to trip length, travel routes, and trip modes, as well as the generation of new trips. The integrated model system also captures long-run induced demand through feedback loops between Travel Model 1.6 and BAUS 2.6. The land use development forecasts generated by BAUS 2.6 are informed by Travel Model 1.6's transportation accessibility measure,

which are altered as transportation projects are implemented into the model. Changes in accessibility can affect the land use growth footprint and ultimately the forecasts of travel behavior and vehicle activity.

These effects of induced demand are captured in both the land use growth footprint, and in the regional travel forecast summaries shown in Section 2.2.2, "Conditions Under the Proposed Plan." This includes VMT, which in the context of this analysis refers to network VMT. Network VMT is an aggregation of each vehicle trip multiplied by the distance of its respective path based upon Travel Model 1.6's forecast of travel behavior and vehicle activity. VMT is quantified in the same manner for both existing and forecasted conditions, and the increment of change is then calculated.

Travel Model 1.6 is not sensitive to the full range of strategies in the proposed plan. Marketing and education campaigns, as well as non-capacity-increasing transportation investments, like bikeshare programs (i.e., Strategy EN9, "Expand Travel Demand Management Strategies"), are examples of strategies with the potential to change behavior in ways that result in reduced VMT and vehicle emissions. Travel Model 1.6 and the Emission Factor (EMFAC) model do not estimate reductions in VMT and emissions in response to these types of changes in traveler behavior. As such, an "off-model" approach was used to quantify the VMT and GHG reduction benefits of these important programs. Off-model analyses are standard elements of an SCS and have been included in all previous MTC SCSs. CARB provides guidance on the off-model analyses in the Final Sustainable Communities Strategy Program and Evaluation Guidelines Appendix D (November 2019) and reviews "the development, quantification, and effectiveness and potential adjustments of the MPO's off-model strategies" as part of the evaluation of MTC's SCS technical methodology (CARB 2019).

IMPACTS AND MITIGATION MEASURES

Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The proposed plan includes several elements to leverage the region's transportation network—including transit, bicycle, and pedestrian systems—to achieve regional goals. Note that the assessment of the proposed plan's impact on VMT is discussed in TRA-2.

Transit and Roadway Facilities

As described in Chapter 2, "Project Description," the regional growth forecast for the Bay Area projects that between 2020 and 2050, the region will support an additional 1.8 million residents and 1.4 million jobs, resulting in 1 million new households. The proposed plan designates Growth Geographies and identifies a set of land use strategies to accommodate the projected growth that would result in focused housing and job growth concentrated primarily in or adjacent to already developed areas and along existing transit corridors. As described in Section 2.3.4, "Proposed Plan Growth Geographies," the proposed plan would focus forecasted growth in infill locations with access to transit. Planning for future growth in Priority Development Areas (PDAs), Transit Rich Areas (TRAs), and High-Resource Areas (HRAs) near transit helps the region accommodate future growth while meeting the region's SB 375 GHG emissions reduction target. The PDAs build on local and regional planning efforts and include 224 locally nominated areas in the nine-county Bay Area.

MTC's 2022 Transit-Oriented Communities (TOC) Policy builds on the Transit-Oriented Development Policy, adopted in 2005. The TOC Policy reflects changes in regional transportation and land use trends since 2005, as well as new information from Plan Bay Area 2050. In 2005, MTC adopted Resolution 3434, a transit-oriented development (TOD) policy for regional transit expansion projects. This policy requires the establishment of a minimum level of development around stations and corridors and the development

of station area plans before regional funds can be programmed and allocated to the transit expansion project. The proposed plan PDA planning policies align with the TOD policy's intent to direct regional growth into areas with transit access.

In 2012, MTC developed the One Bay Area Grant Program (OBAG 1), adopted under Resolution 4035. OBAG 1 aligned fiscal year (FY) 2012 to 2013 through FY 2016 to 2017 federal funding with the SCS by promoting transportation investments in PDAs. With Resolution 4202, MTC established the second round of OBAG (OBAG 2) for funding FY 2017-18 to FY 2021-22. OBAG 2 continued similar policies as OBAG 1, including targeting project investments to PDAs to support the SCS goals. Under the program, counties must direct at least 50–70% of allocated OBAG funds to PDAs. The third round of OBAG funding (OBAG 3) was adopted by MTC in January 2022 and includes more than $750 million in federal funding for projects from FY 2023 to 2026.

MTC adheres to long-standing transportation investment approaches, which include a "Fix It First" commitment to direct most funding to repair, maintain, operate, and optimize the existing roadway and transit system; focused growth in Growth Geographies (including PDAs, PPAs, HRAs, and TRAs) connected to the transportation network; developing a modern transit network; and protecting our climate by reducing our transportation-related emissions.

The proposed plan aligns with this investment framework through its transportation strategies, which include the following:

- T1. Operate and Maintain the Existing System;
- T11. Enhance Transit Frequency, Capacity, and Reliability; and
- T12. Expand Transit Services throughout the Region.

Most of the proposed plan's $500 billion transportation element funds are committed to these strategies.

In addition to investments for transit infrastructure, capital, and maintenance, the proposed plan includes strategies to improve the use of the existing transit network, which aligns with the overall goals to focus on more cost-effective operation approaches. These strategies include:

- T2. Improve the Rider Experience through Transit Network Integration,
- T3. Improve the Rider Experience through Refined Transfer Timing at Key Regional Hubs, and
- T4. Enhance Security Measures and Improve Safety and Cleanliness on Transit.

These strategies align with existing programs and plans to increase transit use in the region. Existing programs and plans include MTC's activities to streamline fare payment and trip planning across transit operators, including managing a Transit Fare Coordination and Integration Study and a Fare Integration Task Force to identify practical steps toward integrating the fare structure and polices of the Bay Area's more than two dozen transit agencies to explore ways to make the region's transit network better coordinated, more affordable, and more attractive. Similarly, MTC is leading the modernization of the Clipper transit fare payment system. The proposed plan includes continued support for Clipper as part of its strategy to Advance Other Regional Programs and Local Priorities.

Table 2-10 in Chapter 2, "Project Description," summarizes the change in forecasted daily transit boardings and daily transit passenger miles. Both transit metrics are forecasted to more than triple, 215% and 256% respectively, from baseline (2023) to proposed plan conditions (2050). Similarly, transit trips are forecasted to double between 2023 and 2050 and increase transit mode share from 4% to 8% of all trips in 2050 (see **Table 2-13**).

The proposed plan's strategies support the region's road network, primarily focusing on repairing and maintaining roadways and making more efficient use of the existing capacity through an expanded managed lane network, which includes carpool and express lanes. In addition to Strategy T1, Operate and Maintain the Existing System, the strategies to improve the road network include:

- T5. Implement Pricing Strategies to Manage Demand;
- T6. Modernize Freeways and Interchanges;
- T7. Expand Freeways and Mitigate Impacts; and
- T8. Advance Other Regional Programs and Local Priorities.

The Bay Area Infrastructure Financing Authority (BAIFA), a joint powers authority between MTC and the Bay Area Toll Authority, manages the Bay Area Express Lanes Network, which currently includes 118 miles with plans for over 600 miles of express lanes by 2035. The proposed plan leverages the express lanes network with strategies to help manage traffic, VMT, and mode choice.

In addition to managed lanes, MTC also has a number of other programs to help improve travel times, maintain optimal speeds, reduce congestion, and reinforce efforts to reduce GHG emissions on the region's roadways. These programs include the Arterial Operations Program; and the "Forward" commute initiatives, which include Bay Bridge Forward, Dumbarton Forward, Napa Valley Forward, and Richmond-San Rafael Forward. These initiatives include strategies such as intelligent transportation systems, metering, traffic monitoring, all-electronic tolling, extensions of high-occupancy vehicle (HOV) lanes, dedicated transit lanes, transit signal prioritizing and adaptive signal timing, increased express bus service, carpool and vanpool programs, commuter parking programs to encourage carpooling, and programs to encourage biking and walking. Along with improving interchanges and addressing bottlenecks, the proposed plan's transit, managed lanes, transportation demand management (TDM), and bicycle and pedestrian strategies align with and support these programs by reducing the demand on the roads. As discussed in Chapter 2, "Project Description," minimal changes to roadway capacity, coupled with increases in commuters and other drivers leads to more hours of vehicle delay on the region's roadway systems. However, it is reasonably foreseeable that the proposed plan's land use and transportation strategies will lead to shifts in travel mode choice decisions, as summarized in **Table 2-13**, with automobile mode shares—drive alone, carpool, and ride hail—decreasing as a share over time, from a combined share of 81% in the baseline (2023) to 71% in 2050.

Therefore, the proposed plan's strategies are consistent with programs, plans, ordinances, and policies addressing transit and roadway facilities.

Bicycle and Pedestrian Facilities

The proposed plan includes strategies to support pedestrians, bicyclists, scooter users, and skateboard users, including those with electronic assistance, as well as strategies designed to reduce reliance on driving. These strategies include:

- T9. Build a Complete Streets Network, and
- T10. Advance Regional Vision Zero Policy through Street Design and Reduced Speeds.

As part of the Complete Streets vision, the proposed plan includes building out approximately 10,000 miles of bike lanes and multiuse paths across the region. The strategies to reduce speeds and design roads that are safe for all users also support the efforts to increase use of roadways by cyclists and pedestrians.

These strategies reflect and support several existing and developing regional programs, plans, and policies. Adopted in 2022 under Resolution 4493, MTC has a Complete Streets policy requiring that all

projects funded with regional funds consider the accommodation of pedestrians, cyclists, public transit users, and drivers as part of project planning, design, funding, and construction. As part of this policy, project sponsors must have a Complete Streets policy or updated circulation element of their local general plan in place and must complete a Complete Streets checklist for the project to access regional funding, such as OBAG 3 and the Active Transportation Program (ATP), the State funding program for bike and pedestrian projects. MTC administers the region's share of the State's ATP funding, which allows cities, counties, transit agencies, and other public agencies to compete for grants to build bicycle/pedestrian paths; install bike racks; and implement other projects and programs that make walking or biking easier, safer, and more convenient. MTC also administers the Bay Area Safe Routes to School program, which taps federal money to provide approximately $5 million each year in grants for cities, counties, and CMAs to fund bike and pedestrian paths that connect with schools, on-street bike lanes, bike racks or other secure bike parking, traffic calming projects, bike safety programs, and education and outreach for students and families.

MTC developed the Bay Area's first regional AT Plan to guide MTC's policy and investment framework needed to achieve the goals of the Plan Bay Area 2050 transportation strategies (T8: Build a Complete Streets Network and T9: Advance Regional Vision Zero Policy through Street Design and Reduced Speeds). Prior to this effort, MTC adopted a Regional Bicycle Plan, which established the Regional Bikeway Network and served to prioritize and guide bicycle-related investments on key bicycle facilities in the region. The AT Plan sets specific active transportation and micromobility goals and identifies regional infrastructure gaps to be closed, policies requiring updating or development, and funding scenarios to help achieve the AT Plan's goals. The AT Plan directly supports the proposed plan strategy to build a Complete Streets Network, as well as help meet the proposed plan mode shift, safety, equity, health, resilience, and climate goals.

The proposed plan forecasts substantial increases in the number of bicycle trips as a share of total trip making. **Table 2-13** in Chapter 2, "Project Description," details a 264% projected increase in bicycle trips from baseline (2023) to future conditions (2050). This increase would result in bicycle trips growing from 2% of all trips in the baseline to 7% of all trips in future conditions. The proposed plan includes a number of other transportation-related strategies aside from those specifically targeting transit, roads, bicycle, and pedestrian facilities:

- EN7. Expand Commute Trip Reduction Programs at Major Employers, and
- EN9. Expand Transportation Demand Management Initiatives.

In partnership with the Bay Area Air District, MTC administers the Commuter Benefits Program (CBP), requiring that employers with 50 or more employees in the Bay Area provide commuter benefits to employees with the goal of reducing VMT and GHG emissions, as authorized by SB 1339 and SB 1128. The proposed plan includes continued support for the CBP as part of its strategy to expand commute trip reduction programs at major employers.

MTC's Climate Initiatives Program funds activities with the primary goal to reduce GHG emissions from the transportation sector and help the Bay Area meet its regional emission reduction targets. This program includes a set of TDM approaches, such as developing targeted outreach and incentives to shift away from vehicle trips and expanding car share locations alongside mobility hubs. MTC also operates regional vanpool and carpool programs and is the contract administrator for the regional bike share system. These TDM initiatives are continued with expanded investments in the proposed plan.

Local jurisdictions and transit agencies also develop plans that affect the circulation system. County Transportation Agencies or CMAs develop congestion management programs (CMPs) and/or CTPs, which are required to be consistent with the RTP/SCS. To this end, MTC issues guidance to ensure that the local and regional plans are aligned. Additionally, any substantial projects included in local plans are incorporated into the RTP, either in the development of the proposed plan or through amendments to the

existing plan. Through this coordinated planning process, the proposed plan is not expected to conflict or be inconsistent with local plans.

MTC also participates in multijurisdictional planning for goods movement, including the impact of this economic activity on land use, the transportation network, and the environment. In 2016, MTC released the San Francisco Bay Area Goods Movement Plan, which responded to the evolving economic context, the need to balance between PDAs and industrial land uses, and GHG and environmental justice issues associated with goods movement. Prior goods movement planning efforts inform the proposed plan's transportation network.

The proposed plan includes investments to protect communities and transportation facilities vulnerable to sea level rise. These adaptation projects align with other regional adaptation and resiliency plans. MTC coordinated with the Bay Conservation and Development Commission and their Adapting to Rising Tides Program on a series of projects to understand the vulnerability and consequences of sea level rise inundation and storm event flooding on transportation infrastructure and the program's products were used to inform the proposed plan.

Therefore, the proposed plan's strategies are consistent with programs, plans, ordinances, and policies addressing bicycle and pedestrian facilities.

Conclusion

The proposed plan approach and strategies align with other regional programs, plans, and policies, including MTC programs administering State and federal programs. MTC partners with the Bay Area Air District and other regional agencies to assure alignment of transportation strategies. The core approach of directing regional growth to infill areas and providing sustainable transportation options to reduce emissions, improve mobility and access, reduce congestion, and increase safety on the transportation system is reflective of federal, State, and local efforts. Implementation of the proposed plan is not expected to substantially conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities, and the impact would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact TRA-2: Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) (PS)

As noted in CEQA Guidelines Section 15064.3(a), in general, VMT is the most appropriate measure of transportation impacts. CEQA Guidelines Section 15064.3(b) provides the criteria for analyzing and determining transportation impacts, as follows:

b. Criteria for Analyzing Transportation Impacts.

1. Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.

2. Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent

that such impacts have already been adequately addressed at a programmatic level, a lead agency may tier from that analysis as provided in Section 15152.

3. *Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.*

4. *Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.*

The criteria in Section 15064.3(b) are primarily directed toward the assessment of project-level impacts, whereas the proposed plan is a regional long-range plan integrating a region-wide suite of projects, programs, and policies, and the proposed plan is analyzed using regional models.

Although VMT has been established as the measure of transportation impacts under SB 743 (see Section 3.15.2, "Regulatory Setting," for further discussion of SB 743), CEQA allows lead agencies to determine the methodology for evaluating VMT (CEQA Guidelines Section 15064.3[b][4]) and to establish a threshold of significance (CEQA Guidelines Section 15064.7).

The State has developed resources to help lead agencies evaluate impacts and establish impact thresholds under VMT standards. Key guidance relevant to transportation impacts and VMT include LCI's (formerly OPR) Technical Advisory (December 2018) and CARB's *2022 Progress Report on California's Sustainable Communities and Climate Protection Act* (2022).

The State's Technical Advisory provides guidance on determining significance thresholds and assessing VMT. The Technical Advisory is directed at providing guidance for specific projects and programs by project type (i.e., residential, retail, and office) or plan type (i.e., general plans, specific plans, etc.) and includes methodology recommendations for evaluating transportation impacts. LCI uses the statewide GHG targets established through 2050 by State laws and executive orders as the basis for its recommended VMT significance thresholds. For project-level analyses, LCI recommends that "a per capita or per employee VMT that is 15% below that of existing development may be a reasonable threshold" based on its review of relevant research on project-level impact mitigation measures. The Technical Advisory guidance addresses general plans (and lesser area plans), but does not address regional plans: "A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land use would, in aggregate, exceed the respective thresholds" for the project-level thresholds, a per capita VMT that is 15% below existing development.

While there is guidance on the appropriate VMT threshold for project-level review and some types of planning review as described above, there is no state guidance on the appropriate threshold of significance for regional VMT impacts in a program-level EIR, such as for an RTP/SCS. Although the reduction amounts developed by LCI and CARB may not apply to significance thresholds for an RTP/SCS, they establish standards that may be used by lead agencies as guidance when evaluating project-level impacts, subject to lead agency discretion as discussed above.

The proposed plan meets other applicable State targets. According to CARB's target setting under SB 375, the proposed plan must achieve at least a 19% per capita reduction in forecasted GHG emissions from light- and medium-duty vehicles in 2035 relative to 2005. The proposed plan meets and exceeds this target (see Criterion GHG-4 in Section 3.6, "Climate Change, Greenhouse Gases, and Energy"). The GHG emission reductions are primarily achieved by land use, transportation, and a subset of environmental strategies in the proposed plan to slow VMT growth in order to reduce vehicle emissions, as opposed to vehicle technology and vehicle fuels improvements.

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The proposed plan is designed to reduce GHG emissions in accordance with SB 375 through complementary land use and transportation strategies. The core land use approach of the proposed plan is to accommodate forecasted changes in population, households, and employment through "focused growth" in existing communities along the existing transportation network, particularly in communities with proximity to frequent, robust transit service. As discussed in detail in Chapter 2, "Project Description," the proposed plan designates less than 1% of the region's land to accommodate the Bay Area's regional growth forecast (see Impact TRA-1) and identifies a series of housing and economic strategies to affect the regional growth pattern. The Growth Geographies in the proposed plan accommodate 73% of the land use growth footprint. The proposed plan's combination of designated Growth Geographies and land use strategies focus housing and job growth primarily into infill areas with access to transit and other mobility options. The regional growth forecast along with the proposed plan's Growth Geographies, strategies, and ensuing forecasted development pattern leads to a shift from automobile travel to public transit and nonmotorized modes over the plan horizon (2050) in order to achieve SB 375's mandate to reduce GHG emissions (see Section 2.2.3, "Conditions Under the Proposed Plan," for a complete summary of regional travel forecasts).

The focused growth approach is articulated in strategies in the Housing and Economy Elements of the proposed plan, discussed in Chapter 2, "Project Description." The Housing Element includes a set of strategies that spur increased housing density in Growth Geographies, particularly Strategy H3, "Allow a Greater Mix of Housing Densities and Types in Growth Geographies." To support growth and the ability for households of all incomes to have transit access, the suite of strategies spurs affordable housing development and preservation, and strengthens renter protections. The Economy Element includes strategies— EC4, "Allow Greater Commercial Densities in Growth Geographies" and EC5, "Provide Incentives to Employers to Shift Jobs to Housing-Rich Areas Well Served by Transit"—to encourage locating jobs and housing closer to each other, and potentially reducing the commute distances throughout the region.

The housing and economy strategies influence the proposed plan's forecasted development pattern, which informs travel patterns in 2050. These travel patterns, when coupled with the transportation strategies, are simulated in the regional travel model, Travel Model 1.6, to derive a series of forecasted travel metrics to contrast to simulated baseline conditions (2023). Metrics include summaries of trips by mode, their average travel time and distance, and the purpose of the trip. **Table 3.15-7** summarizes automobile trips by purpose—commute versus non-commute—and their respective average travel distances. Overall, implementation of the proposed plan would lead to shorter automobile trip distances for both commute and non-commute trips. Auto commute trip distances are expected to decrease by 5% and non-commute trips are forecasted to decrease by 4% between 2023 and 2050.

Table 3.15-7: Average Travel Distance per Automobile Trip by Purpose

	2023 Baseline (miles)	2050 Proposed Plan (miles)	Change (2023 to 2050) Numerical	Change (2023 to 2050) Percent
Commute	9.7	9.2	-0.5	-5%
Non-Commute	4.6	4.4	-0.2	-4%

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In addition to shorter automobile trips, the proposed plan's land use strategies would result in increases in higher density, multifamily housing units in developed areas, where services tend to be closer to residences, walking and biking become more viable travel options, and transit is relatively more available. This type of development would allow for households to reduce their reliance on automobile travel, as summarized in **Table 3.15-8**. Implementation of the proposed plan would lead to higher shares of households with zero vehicles relative to existing conditions and reduce the share of households with multiple automobiles.

Table 3.15-8: Household Automobile Ownership

	2023 Baseline	2050 Proposed Plan	Change (2023 to 2050) Numerical	Change (2023 to 2050) Percent
Share of Households with Zero Automobiles	9%	13%	4	44%
Share of Households with One Automobile	33%	33%	0	0%
Share of Households with Multiple Automobiles	59%	54%	-5	-8%
Average Number of Vehicles by Household	1.42	1.45	0.03	2%

Note: Figures may not sum due to independent rounding. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as people who are incarcerated.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

In addition, the proposed plan includes an array of transportation strategies that would improve access to non-automobile transportation modes, travel times, and trip costs, and ultimately mode choice. The Transportation Element includes substantial investments in transit capital, infrastructure, and operations and maintenance and in bicycle and pedestrian facilities. In addition to investments in physical systems, the proposed plan would advance improvements to make transit and other non-automobile modes more convenient and attractive through integrated fare policies, streamlined multimodal trip planning and fare payment, and TDM strategies. These strategies include (see Chapter 2, "Project Description," for more detail on the strategies):

- T2. Improve the Rider Experience through Transit Network Integration;
- T3. Improve the Rider Experience through Refined Transfer Timing at Key Regional Hubs;
- T4. Enhance Security Measures and Improve Safety and Cleanliness on Transit;
- T5. Implement Pricing Strategies to Manage Demand;
- T9. Build a Complete Streets Network;
- T10. Advance Regional Vision Zero Policy through Street Design and Reduced Speeds;
- T11. Enhance Transit Frequency, Capacity, and Reliability;
- T12. Expand Transit Services throughout the Region;
- EN7. Expand Commute Trip Reduction Programs at Major Employers; and
- EN9. Expand Transportation Demand Management Initiatives.

These transportation and environmental strategies, in combination with the housing and economy strategies described above, would shift trips throughout the Bay Area away from driving and toward transit, walk, and bike modes. As shown in **Table 3.15-9**, automobile trips (drive alone, carpool, and ride hail) make up 81% of all trips in 2023 and would make up 71% in 2050 under the proposed plan.

Table 3.15-9: Count and Share of Daily Trips by Mode

Mode	2023 Baseline Trips	2023 Baseline % of Total	2050 Proposed Plan Trips	2050 Proposed Plan % of Total
Drive Alone	11,349,000	46%	12,811,000	41%
Carpool	8,045,000	32%	8,865,000	28%
Ride Hail	650,200	3%	837,200	3%
Automobile "Vehicle" Subtotal	20,044,000	81%	22,513,000	71%
Walk	3,342,000	13%	4,341,000	14%
Transit	906,900	4%	2,568,000	8%
Bike	570,600	2%	2,075,000	7%
Total Trips	24,864,000	100%	31,497,000	100%

Note: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum due to independent rounding; Trips and mode share do not account for expected trip reductions from the implementation of Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Similarly, the proposed plan would result in a lower share of workers in the Bay Area commuting by automobile in 2050 compared to 2023. As shown in **Table 3.15-10**, the share of workers commuting to work by automobile (drive alone, carpool, and ride hail) would drop from 58% in 2023 to 48% in 2050 in the proposed plan. Despite the addition of 1.4 million new jobs in the region, implementation of the proposed plan would result in fewer workers commuting by driving alone relative to baseline (2023) conditions. A greater share of workers in the proposed plan are expected to take transit and bike in 2050. The mode shift in commute trips is particularly impactful on overall VMT because commute trips are longer on average than trips for other purposes (see **Table 3.15-7**).

Table 3.15-10: Share of Workers by Commute Mode

Mode	2023 Baseline % of Total	2050 Proposed Plan % of Total
Drive Alone	41%	31%
Carpool	16%	16%
Ride Hail	1%	1%
Automobile "Vehicle" Subtotal	58%	48%
Walk	2%	2%
Transit	6%	14%
Bike	3%	6%
Work-from-Home	31%	29%

Note: Trips and mode share do not account for expected trip reductions from the implementation of Strategy EN9 due to modeling limitations.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The proposed plan includes major highway projects that would add capacity ("lane miles") to the region's freeways and expressways. As detailed in **Table 2-7** in Chapter 2, "Project Description," the proposed plan

would add approximately 130 lane miles (1% increase). Most of the new freeway lane miles would be priced, and the amount of priced freeway lane miles would increase to 100% by 2050. Adding lane miles is known to induce more automobile travel, and pricing lanes is known to reduce auto travel. In addition to pricing, he proposed plan includes funding to finance VMT mitigation costs associated with projects that add lane-miles, as well as other land use, transportation, and environmental strategies to reduce any anticipated induced travel from implementing capacity-increasing highway projects. The proposed plan includes targeted strategies aimed at suppressing and shifting automobile travel, including:

- T2. Improve the Rider Experience through Transit Network Integration;
- T3. Improve the Rider Experience through Refined Timing at Key Regional Hubs;
- T4. Enhance Security Measures and Improve Safety and Cleanliness on Transit;
- T5. Implement Pricing Strategies to Manage Demand;
- T9. Build a Complete Streets Network;
- T11. Enhance Transit Frequency, Capacity, and Reliability;
- T12. Expand Transit Service throughout the Region; and
- EN9. Expand Transportation Demand Management Initiatives.

These strategies would help reduce regional daily vehicle trips per capita by 13% and VMT per capita by 5%, as shown in **Table 3.15-11**. The net impact of the transportation strategies, including investments in transit, bicycle, and pedestrian infrastructure expansion; priced roads; and other strategies is an overall reduction in VMT per capita relative to baseline conditions.

Table 3.15-11: Summary of Baseline and Proposed Plan 2050 Vehicle Trips and VMT

	2023 Baseline	2050 Proposed Plan	Change (2023 to 2050) Numerical	Change (2023 to 2050) Percent
Total Population	7,465,000	9,599,000	2,134,000	29%
Daily Vehicle Trips	20,044,000	22,5123,000	2,469,000	12%
Daily Vehicle Trips per Capita	2.7	2.3	-0.4	-13%
Daily VMT	146,877,000	178,605,000	31,728,000	22%
Daily VMT per Capita	19.7	18.6	-1.1	-5%

Note: Numbers have been rounded (between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum due to independent rounding. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as prison inmates. Daily trips and VMT do not account for expected trip reductions from the implementation of Strategy EN9 due to modeling limitations.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

As noted in the methodology, Travel Model 1.6 is not sensitive to the full range of strategies in the proposed plan. As a result, the VMT reduction benefits of Strategy EN9, "Expand Transportation Demand Management Initiatives," are calculated "off-model." The implementation of Strategy EN9 would result in additional VMT reductions to those disclosed in **Table 3.15-11**, and includes supporting the expansion of regional bike share service; developing assistance for car share implementation along with assistance for mobility hub development; providing targeted transportation alternatives programs to provide personalized information and encouragement to shift individual travel choices from driving alone to ridesharing, transit, biking, or walking; supporting vanpool programs, including assistance for ride-matching, startup and operations, and employer outreach; and supporting the development of shuttles and microtransit services.

Implementation of sea level rise adaptation projects under the proposed plan's Strategy EN1, "Adapt to Sea Level Rise," is not expected to have an effect on VMT because the adaptation projects would elevate roadways from future inundation and would not increase capacity on the roadways. Instead, the adaptation projects would alleviate risk from inundation of existing and forecasted land use development and transportation assets and support the proposed plan's core land use approach to "focus growth" in existing communities along the existing transportation network. Without the adaptation projects, rising sea levels could result in inundation of these transportation assets, reducing access to destinations that could require longer trip routes with corresponding increases in VMT, and could have a long-term effect on the land use growth footprint and the forecasts of travel behavior and vehicle activity.

Conclusion

Overall, the impact of the proposed plan would result in an increase in total regional VMT and a decrease in regional per capita VMT between the base year (2023) and 2050, as shown in **Table 2-10** of Chapter 2, "Project Description," and combined in part in **Table 3.15-11**. Implementation of the proposed plan would result in a VMT per capita rate 6% lower in 2050 than in 2023. It should be noted that MTC and ABAG have funding set aside to implement mitigation activities that would reduce VMT. This funding would not cover the full cost of all mitigation actions included below but would address some VMT impacts associated with capacity increasing projects. The travel forecasts included in **Table 3.15-11** do not take credit for any VMT mitigations or assume VMT reductions from this funding. Therefore, VMT impacts in this EIR are likely overstated since they do not account for VMT reductions associated with the mitigation funding.

If implemented, the proposed plan's comprehensive suite of transportation, housing, economic, and environmental strategies would result in regional per capita VMT reductions and would not impede achievement of additional statewide VMT reductions required to meet the State's statutory GHG emission targets.

The ability to facilitate further reductions in per capita VMT relies on local jurisdictions as they review and entitle individual land use and transportation projects. The Technical Advisory states that "at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact" because of the gap in the SB 375 targets and the GHG reductions necessary to achieve the statewide goals (LCI 2018). As discussed earlier, LCI and CARB provide guidance on VMT-impact evaluations and suggested significance thresholds that are applicable to project-level assessments. Additionally, the SB 743 and the CEQA Guidance include CEQA streamlining opportunities for land use projects located near transit, and transportation projects that reduce VMT, such as transit and bicycle infrastructure projects, are assumed to have impacts that are less than significant.

Nevertheless, because there is a gap between the GHG emissions reductions that can be achieved from targets established by CARB under to SB 375 and the reductions needed to achieve statewide GHG reduction goals, and because the ability to bridge this gap depends on additional State-led VMT reduction strategies (CARB 2022) and on implementation of land use, TDM, and other strategies that can only be employed at the local jurisdictional level, MTC and ABAG cannot conclude that the reductions would be sufficient to meet the State's climate goals. Therefore, Impact TRA-2 would be **potentially significant (PS)**. Mitigation Measures TRA-2a, TRA-2b, and TRA-2c address this impact and are described below.

Mitigation Measures

The State has recognized that additional State policy actions and funding would be required to close the VMT gap between what the MPOs could achieve through implementation of their SCSs and reductions needed to meet State goals (CARB 2022). Though the State must initiate these additional actions and funding programs, the exact form of the policies and funding programs must be collaboratively developed with input from MPOs, local agencies, and other organizations to ensure they provide the tools and incentives necessary to go beyond the SCSs in reducing VMT. MTC will be an active participant with State

and local agencies in this process to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in Appendix C of the 2022 Scoping Plan, through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities.

Mitigation Measure TRA-2(a) MTC shall work with State and local agencies to ensure implementation of components of the plan that will help to reduce regional VMT, particularly projects that improve or expand transit service, as well as bicycle and pedestrian facilities. These transportation projects, in conjunction with land use policies included in the plan, will help the region to achieve the projected decreases in regional VMT per capita and achieve the region's SB 375 targets for GHG emissions. MTC will collaborate with State and other agencies to explore the feasibility of new programs for reducing VMT, such as VMT fees, banks, and exchanges.

Mitigation Measure TRA-2(b) Implementing agencies and/or project sponsors shall implement measures, where feasible and as applicable based on project- and site-specific considerations, consistent with MTC's "Key SB 743 Implementation Steps for Land Use Projects" that consist of but are not limited to those identified below (or equally effective measures):

TDM strategies shall be incorporated into individual land use and transportation projects and plans, as part of the planning process. These TDM measures are strategies not included in EN9, rather they are measures that could and should be implemented by the local agency based on land use authority that neither MTC nor ABAG has. Local agencies shall incorporate strategies identified in the Federal Highway Administration's (FHWA's) publication: *Integrating Demand Management into the Transportation Planning Process: A Desk Reference* (August 2012) into the planning process (FHWA 2012). For example, the following strategies may be included, as applicable, to encourage use of transit and nonmotorized modes of transportation and reduce VMT on the region's roadways:

- include TDM mitigation requirements for new developments;
- incorporate supporting infrastructure for nonmotorized modes, such as bike lanes, secure bike parking, sidewalks, and crosswalks;
- provide incentives to use alternative modes and reduce driving, such as universal transit passes, road and parking pricing;
- implement parking management programs, such as parking cash-out, priority parking for carpools and vanpools;
- develop TDM-specific performance measures to evaluate project-specific and system-wide performance;
- incorporate TDM performance measures in the decision-making process for identifying transportation investments;
- implement data collection programs for TDM to determine the effectiveness of certain strategies and to measure success over time; and
- set aside funding for TDM initiatives.

Mitigation Measure TRA-2(c) Implementing agencies and/or project sponsors shall implement the following measure, where applicable and necessary based on project- and site-specific considerations (or equally effective measures):

Implement Mitigation Measure GHG-3.

Significance after Mitigation

The ability to close the gap between the SB 375 targets and the reductions needed to meet State GHG goals linked to transportation is tied to local jurisdictions and their ability to meet VMT targets in compliance with thresholds set pursuant to CEQA Guidelines Section 15064(3)(b). There is no assurance that implementation of the proposed mitigation measures would be enough to achieve the regional reductions needed to attain the statewide 2050 targets. Additional regulatory action that results in substantial GHG reductions throughout all sectors of the State economy and based on State-adopted regulations would likely be needed to attain such goals, and they are beyond the feasible reach of MTC and ABAG and local jurisdictions.

Projects taking advantage of the CEQA streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described above, as applicable, to address site-specific conditions. The implementing agency would ensure that TDM measures are incorporated into projects to the extent feasible. Implementation of the mitigation measure at a project-level would encourage sustainable modes of transportation and reduce the potential for the proposed plan to increase VMT on the regional transportation network. However, MTC and ABAG cannot require local implementing agencies to adopt the above mitigation measures, and it is ultimately the responsibility of a lead agency to determine and adopt mitigation. In addition, the State has indicated that additional State policy actions and funding would be required to close the VMT gap between what the MPOs could achieve through implementation of their SCSs and reductions needed to meet State goals. Therefore, this impact would be **significant and unavoidable (SU)** for purposes of this program-level review.

Impact TRA-3: Substantially increase hazards due to geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The land use growth footprint of the proposed plan does not define design-level features of roadways. Although the proposed plan expands development and increases density in Growth Geographies, this growth would not impact geometric design features or roadway uses in a consistent way, as those design standards and uses are established and enforced at the local jurisdictional level. Specific transportation projects under the proposed plan would be subject to and expected to follow the design guidelines and allowable uses established by the State or the local jurisdiction with authority over the project.

Construction activities from implementation of the proposed plan would be short term, intermittent, and geographically dispersed. At the regional level, these disruptions would be localized, and effects would be limited and would not represent significant impacts to the operations of the regional transportation system. At the local level, construction activities could increase travel on local roads and result in detours or increased congestion in certain locations. The actual construction details of land use development projects and proposed transportation projects are not known because the projects are in the early stages of planning. Construction impacts would be evaluated at the project level as more information about the timing, design, scope, and construction program become available. Generally, construction activities for land use development and transportation projects would be required to be conducted in accordance with, and subject to review by, all applicable State and local jurisdictions with authority over the project, thus, ensuring projects would be designed to minimize the potential for hazardous conditions and to ensure safe travel by all modes.

Local safety planning efforts are supported by regional policies and strategies. MTC's Regional Safety/Vision Zero Policy, established under Resolution 4400 in June 2020, affirms MTC's commitment to working collaboratively with partner agencies at the county and local levels to encourage and support equitable and data-driven actions to achieve the target of eliminating traffic fatalities and serious injuries

in the Bay Area by 2030. The Vision Zero framework serves as the basis for MTC's approach to establishing the regional safety performance measures and targets required under the FHWA and Federal Transit Association Transportation Performance Management Program.

Complete Streets policies and programs also support reducing hazards on roadways and preventing incompatible uses by designing roads for all trip purposes, including for more vulnerable users, such as cyclists and pedestrians. In March 2022, MTC adopted Resolution 4493 updating the Bay Area's regional Complete Streets Policy, first adopted in 2006, requiring that all projects seeking regional funding or endorsements from MTC to comply with Complete Streets principles, including using All Ages and Abilities design guidelines on the active transportation network. As part of this policy, project sponsors must have a Complete Streets policy or updated circulation element of their local general plan in place and must complete a Complete Streets checklist for the project to access regional funding, such as OBAG and the ATP.

In accordance with the Regional Safety/Vision Zero and Complete Streets policies, the proposed plan includes proposed investments directed toward designs and enforcement efforts that would improve safety on the roads (Strategy T10) and investments for an expanded Complete Streets network (Strategy T9). These investments would go to local jurisdictions committing to projects that install design elements that lower driving speeds or implement road diets and to projects that make biking and walking safer.

Conclusion

The proposed plan is not expected to adversely affect the design of transportation facilities. Rather, investments are expected to incentivize design improvements to make roadways safer. Therefore, the potential of the proposed plan to substantially increase hazards due to geometric design features or incompatible uses would be **less than significant (LTS)**.

Mitigation Measures

None required.

Impact TRA-4: Result in inadequate emergency access (LTS)

Land Use, Sea Level Rise Adaptation, and Transportation System Impacts

The proposed plan's impact on emergency response plans and evacuation plans is analyzed under Impact HAZ-6 in Section 3.9, "Hazards and Wildfire." The proposed plan's core approach remains "focused growth" in existing communities along the existing transportation network encouraging more dense development in developed areas. Dense development in developed areas is generally more efficient at serving the public for emergency response. This is often because developed areas tend to be well served with these facilities and also because the denser land use growth footprint better facilitates access to specific sites.

The sea level rise adaptation projects included in the proposed plan would be anticipated to benefit emergency access by protecting areas from potential hazards, including flooding, that could otherwise impair emergency access using transportation facilities.

Transportation infrastructure plays a key role in providing access to destinations during emergencies. These systems must be able to provide access for emergency response vehicles, personnel, and equipment. In widespread disasters, the Bay Area's roads and other transportation networks can determine the success or failure of the region during the emergency and in the recovery.

Land use and transportation projects would require construction activities that may cause temporary impairments or increased congestion on transportation facilities that are used for emergency access, such as construction equipment for a building project blocking part of a street or construction of a new roadway lane temporarily redirecting travel on an alternate route. All transportation projects in the

proposed plan would be required to comply with local regulations regarding the maintenance of emergency access during construction. Road closures would be temporary and would be coordinated with emergency responders so that alternative evacuation routes could be developed and employed. Construction associated with implementation of the proposed plan would not likely hinder emergency access. Although construction activities could temporarily impair roadways used for emergency response and evacuation, standard construction procedures for development of a construction management plan would address these conditions and would require development of alternative routes. Projects requiring encroachment permits for temporary construction activities in public roadways that could be used for emergency response or evacuation are generally required to prepare traffic mitigation plans that address traffic control during the period when project construction is occurring within public right-of-way. To address any temporary road closures that would be required during construction, standard construction procedures include notification of emergency responders and development of alternative routes for emergency access.

The actual design details of land use development projects and proposed transportation projects are not known because the projects are in the early stages of planning. However, local jurisdictions have design standards for new and existing development and roadways to ensure adequate passage of emergency vehicles. Standards include specifications related to clear width, effective turning radius, and turnouts. Further, emergency access for land use development and transportation projects would be subject to review by State and local jurisdictions with authority over the project, as well as responsible emergency service agencies; thus, ensuring projects would be designed to meet all applicable emergency access and design standards.

Conclusion

Although implementation of the proposed plan's land use growth footprint, sea level rise adaptation projects, and transportation projects could temporarily impede emergency access at those project locations during construction periods, construction projects must conform to local regulations requiring maintenance of emergency access during construction. Therefore, the potential of the proposed plan to result in inadequate emergency access would be **less than significant (LTS)**.

Mitigation Measures

None required.

4 ALTERNATIVES TO THE PROPOSED PLAN

EIRs are required to consider alternatives to the project that are capable of reducing or avoiding significant environmental impacts. Section 15126.6(f) of the CEQA Guidelines states:

Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

Section 15126.6(a) of the CEQA Guidelines requires EIRs to describe "...a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives that are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason." (See also CEQA Guidelines Section 15126.6[f].) This section of the CEQA Guidelines also provides guidance regarding what the alternatives analysis should consider.

The CEQA Guidelines require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project as proposed (CEQA Guidelines Section 15126.6[d]). The CEQA Guidelines further require that the "no project" alternative be considered (CEQA Guidelines Section 15126.6[e]).

In defining "feasibility" (e.g., "...feasibly attain most of the basic objectives of the project..."), CEQA Guidelines Section 15126.6(f)(1) states, in part:

> Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

This chapter presents the alternatives development and screening process, describes the alternatives, and analyzes the three alternatives to the proposed plan. Key features of each alternative are described. A discussion pertaining to each alternative's ability to meet the project objectives and to lessen significant impacts of the project are provided (see Section 4.5, "Comparative Impact Analysis of Alternatives," and Section 4.7, "Ability to Meet Project Objectives"). This alternatives analysis contains a summary comparison of the proposed plan and plan alternatives and discussion of the environmentally superior alternative.

In determining the alternatives that should be considered in the EIR, it is important to consider the objectives of the project, the project's significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is feasible or infeasible is made by the lead agency's decision-making body—here, the MTC Commissioners and ABAG Executive Board. (See PRC Sections 21081.5 and 21081[a][3].)

Comments received on the Notice of Preparation provided recommendations for project elements and alternatives, including an alternative that adjusts density and parking requirements based on local context and existing built environments; an alternative prioritizing growth in Equity Priority Communities (EPCs, formerly known as "Communities of Concern") and areas outside major job centers; an alternative restricting new development in areas projected to be inundated by 4.9 feet of sea level rise; and an alternative assuming a reduction in federal revenue, impacting available transportation investments.

The CEQA Guidelines note that comments received during the Notice of Preparation scoping process can be helpful in "identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important" (CEQA Guidelines Section 15083). Neither the CEQA Guidelines nor statutes require a lead agency to respond directly to comments received in response to the Notice of Preparation, but they do require that they be considered. Consistent with these requirements, the comments received in response to the Notice of Preparation have been carefully reviewed and considered by MTC and ABAG in the preparation of the alternatives analysis presented in this section. In some cases, these comments are already addressed by the proposed plan. In others, they are included in the framework of the alternatives. A discussion of various suggested alternatives is provided below.

Appendix B includes all Notice of Preparation comments received.

4.1 DEVELOPMENT OF THE ALTERNATIVES TO THE PROPOSED PLAN

4.1.1 Consideration of the Alternatives to the Proposed Plan

As discussed in Chapter 1.0, "Introduction," MTC and ABAG conducted a multiyear plan development process that began with public engagement before advancing into the Blueprint phase. Engagement focused on gaining insights on the pandemic's impact on Bay Area residents and sought to identify shifts in priorities and concerns, while the Blueprint phase developed the draft of the proposed plan. The Final Blueprint's 35 strategies were designed to help the Bay Area accommodate future growth while advancing the region's vision for 2050—ensuring it becomes more affordable, connected, diverse, healthy, and vibrant for all.

On January 14, 2025, in accordance with the CEQA Guidelines, MTC and ABAG filed the Notice of Preparation of the EIR for Plan Bay Area 2050+. The purpose of the Notice of Preparation was to seek comments about the scope and content of the EIR, including solicitating feedback on EIR alternatives that should be evaluated. On Wednesday, January 19, 2025, MTC and ABAG conducted an online public scoping meeting. At this meeting, a presentation by MTC and ABAG staff provided an overview of the proposed plan, the CEQA process, and key environmental issues identified in the Notice of Preparation. No oral or written comments were received during the meeting. Comments pertaining to plan alternatives received during the scoping period were considered during development of the proposed plan and plan alternatives. (See Section 4.2, "Alternatives Considered but Not Evaluated Further.")

The previously considered alternatives and adopted Plan Bay Area plans also helped inform and refine the alternatives considered in this EIR (see Section 4.1.3, "Previous Versions of Plan Bay Area and Alternatives"). In advancing the considerations of alternatives, any alternative must attain the underlying purpose of the plan, including accommodating forecasted growth through 2050, as well as attaining most of the plan's objectives (see Section 4.7, "Ability to Meet Project Objectives").

4.1.2 Project Objectives

The CEQA Guidelines state that an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen some of the significant effects of the project and that it shall evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6).

The proposed plan's overall goal is to "ensure by the year 2050 that the Bay Area is affordable, connected, diverse, healthy, and vibrant for all." As part of the planning process stretching back to Plan Bay Area 2050, MTC and ABAG developed guiding principles and associated performance measures for the proposed plan in conjunction with members of the public, partners, and elected officials. In addition, Senate Bill (SB) 375 mandates two performance targets related to housing the population and achieving greenhouse gas (GHG) emissions reduction targets. Together, the guiding principles and performance metrics serve as the basis for the following CEQA objectives:

1. Address climate change by reducing carbon dioxide (CO_2) emissions according to targets established by the California Air Resources Board (CARB); specifically, meet or exceed a 19% reduction in per capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels.
2. House 100% of the region's projected growth by income level, and with no increase in in-commuters over the proposed plan baseline year.
3. Ensure that all current and future Bay Area residents and workers have sufficient housing options they can afford by reducing how much residents spend on housing and transportation and by producing and preserving more affordable housing.
4. Support an expanded, well-functioning, safe, and multimodal transportation system that connects the Bay Area by improving access to destinations and by ensuring residents and workers have a transportation system they can rely on.
5. Support an inclusive region where people from all backgrounds, abilities, and ages can remain in place with full access to the region's assets and resources by creating more inclusive communities and reducing the risk that Bay Area residents are displaced.
6. Conserve the region's natural resources, open space, clean water, and clean air with the intent of improving health of Bay Area residents and workers and improving the health of the environment locally and globally.
7. Support the creation of quality job opportunities for all and ample fiscal resources for communities by enabling the Bay Area economy to thrive and supporting the recovery of the region's downtowns from the pandemic.

4.1.3 Previous Versions of Plan Bay Area and Alternatives

The proposed plan and plan alternatives build upon previous versions of Plan Bay Area. The 2013 Plan Bay Area was the first Bay Area RTP to integrate the SCS, as required by SB 375 (MTC and ABAG 2013). Plan Bay Area 2040 was an update to the 2013 Plan. Plan Bay Area 2050 extended the planning period from

2040 to 2050. As discussed in more detail in Section 1.7.3, "Federal and State Requirements," the Plan Bay Area is updated every 4 years, consistent with update requirements that pertain to RTPs (e.g., California Government Code Section 65080). Each update to the plan addresses evolving issues, including but not limited to changes to the growth forecast and planning horizon.

Consideration of the alternatives to the proposed plan builds upon prior transportation and land use plans adopted and alternatives considered in the 2013, 2017, and 2021 Plan Bay Area EIRs (MTC and ABAG 2013, 2017, 2021). Although the growth forecasts have changed over time, the planning horizons have been extended, and the processes to develop the original Plan Bay Area (2013), Plan Bay Area 2040 (2017), Plan Bay Area 2050 (2021), and the proposed plan differed in approach, each Bay Area RTP/SCS and the feasible alternatives identified for each were developed to meet the same overarching goals of achieving the GHG emissions reduction targets and housing the projected population. In general, the prior plans and plan alternatives provide context for development of the alternatives to the proposed plan evaluated in this chapter.

PLAN BAY AREA (2013) AND ALTERNATIVES

Adopted in 2013, the first iteration of Plan Bay Area was designed to create a network of complete communities; increase the accessibility, affordability, and diversity of housing; create jobs to maintain and expand a prosperous and equitable regional economy; and protect the region's unique natural environment. The transportation investments and policies of the 2013 Plan were based on available funding through 2040 and supported the plan's goals by reducing automobile dependency and promoting healthier communities through reduced pollution and cleaner air.

The following alternatives were developed and evaluated in the Plan Bay Area (2013) EIR:

- **No Project Alternative:** The No Project Alternative represented the potential scenario if Plan Bay Area were not implemented. Under this alternative, no new regional policies would be implemented to influence local land use patterns, and no uncommitted transportation investments would be made.
- **Transit Priority Focus Alternative**: This alternative developed a focused growth pattern primarily in the region's urban core by relying on Transit Priority Project eligible areas, which are areas with high-frequency transit service that are eligible for higher-density development streamlining, in accordance with SB 375. The Transit Priority Project framework was meant to leverage the significant investment that the region has made and continues to make in transit service.
- **Enhanced Network of Communities Alternative**: This alternative provided sufficient housing for all people employed in the Bay Area and allowed for more dispersed growth patterns than the 2013 Plan.
- **Environment, Equity, and Jobs Alternative**: This alternative sought to maximize affordable housing in high-opportunity urban and suburban areas through the use of incentives and housing subsidies. The suburban growth was supported by increased transit service to historically disadvantaged communities through a vehicle miles traveled (VMT) tax and higher bridge tolls.

PLAN BAY AREA 2040 AND ALTERNATIVES

Plan Bay Area 2040 (2017) was a strategic update to the previously adopted long-range regional plan, building on earlier work to develop an efficient transportation network, provide more housing choices, and grow in a financially and environmentally responsible way. It was developed to achieve targets for GHG emissions reductions, consistent with the Sustainable Communities and Climate Protection Act of 2008 (SB 375), lawsuit settlement agreements, and other regional goals.

The following alternatives were evaluated in the 2017 EIR:

- **No Project Alternative:** The No Project Alternative illustrated trends assumed under adopted local general plans and zoning without an adopted regional SCS plan, and assumed no new transportation projects beyond those under construction at the time or those that had both full funding and environmental clearance.
- **Main Street Scenario:** This alternative dispersed future household and job growth into the downtowns of all Bay Area communities and emphasized the expansion of express lanes, increases in highway capacity, and increases to suburban bus service to dispersed job centers.
- **Big Cities Scenario**: This alternative concentrated future household and job growth into the Bay Area's three largest cities (San Jose, San Francisco, and Oakland) and emphasized core capacity and connectivity by expanding the South Bay transit system and linking regional rail systems into the heart of San Francisco and San Jose.
- **Equity, Environment, and Jobs Alternative:** This alternative was brought forward from the 2013 Plan EIR and updated to reflect input submitted during the Notice of Preparation process and to adhere to the planning assumptions in the Plan Bay Area 2040 (e.g., regional forecasts and transportation projects). This alternative aimed to reduce the risk of displacement in urban EPCs and reduce adverse environmental impacts related to the expansion of the transportation system. In comparison to the Plan Bay Area 2040, the Equity, Environment, and Jobs Alternative resulted in higher household growth in East Bay and South Bay counties and higher job growth in East Bay and Peninsula counties.

PLAN BAY AREA 2050 AND ALTERNATIVES

The adopted Plan Bay Area 2050 (2021) was a comprehensive update of the long-range regional plan and focused on four interrelated elements—housing, the economy, transportation, and the environment. Plan Bay Area 2050 included 35 integrated strategies across the four elements to provide a blueprint for how the Bay Area can accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges and achieve regional GHG emissions reduction targets established by CARB in accordance with SB 375.

The following alternatives were evaluated in the 2021 EIR:

- **No Project Alternative:** The No Project Alternative illustrated trends assumed under adopted local general plans and zoning without an adopted regional plan, and assumed no new infrastructure projects beyond those under construction at the time or those that had both full funding and environmental clearance ("committed"). Under the No Project Alternative, housing growth would be more dispersed, while job growth would be slightly more concentrated in the region's two largest job centers of San Francisco and Silicon Valley.
- **Transit-Rich Areas Focus Alternative:** This alternative was characterized as providing a compact growth pattern, with the greatest share of housing and job growth in Transit-Rich Areas (TRAs)—especially within walking distance of regional rail stations. To support this more urban-oriented growth pattern, additional core capacity transit investments were funded in lieu of highway projects that add lane-mileage to the system.
- **High-Resource Areas Focus Alternative:** This alternative addressed the regional challenges of displacement and gentrification by shifting more housing growth toward locations with well-resourced schools and access to jobs and open space that have historically rejected more housing growth.

4.2 ALTERNATIVES CONSIDERED BUT NOT EVALUATED FURTHER

Alternatives were considered during scoping of the proposed plan, including suggestions from stakeholders. CEQA Guidelines Section 15126.6(c) identifies three factors that may be used to eliminate alternatives from detailed consideration in an EIR: failure to meet most of the basic project objectives, infeasibility, and inability to avoid significant environmental impacts. "Feasible" is defined as "capable of being accomplished within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (CEQA Guidelines Section 15364). The feasibility of an alternative may be determined based on a variety of factors, including economic viability, availability of infrastructure, and other plans or regulatory limitations (CEQA Guidelines Section 15126.6[f][1]). The following discussion briefly describes each alternative suggested during the scoping process that was not evaluated further and states the reason why each has not been included for analysis.

4.2.1 Local Context Alternative

The City of Livermore suggested an alternative with a land use scenario that would adjust density and parking based on local context and existing built environments. While this approach may enhance local flexibility, it could also result in less concentrated growth, leading to higher VMT, increased air pollution, GHG emissions, and energy consumption. Transit-oriented communities and compact urban growth help reduce these environmental impacts. There is no evidence that a more localized approach would yield greater environmental benefits. Additionally, the No Project Alternative evaluates a similar scenario by maintaining existing density standards and local parking policies while avoiding upzoning. Because this alternative would not be expected to reduce significant environmental effects compared to the proposed plan, it is not identified for further study in the EIR.

4.2.2 Equity Priority Communities Alternative

Alameda County suggested an alternative growth approach to prioritize EPCs and areas outside major job centers. While increasing housing access and economic opportunities in EPCs could offer social benefits, concentrating too much growth in these areas may reinforce exclusion by allowing higher resource areas to avoid new housing. Redirecting growth away from job centers could worsen the region's housing shortage by limiting the supply of housing near employment centers, leading to longer commute times, increased VMT, and higher GHG emissions. Additionally, this alternative does not align with the plan objective to support the creation of quality job opportunities for all and ample fiscal resources for communities by enabling the Bay Area economy to thrive and supporting the recovery of the region's downtowns from the pandemic. Because this alternative does not demonstrate an ability to reduce significant environmental effects compared to the proposed plan and is inconsistent with the plan objectives it is not identified for further study in the EIR.

4.2.3 Sea Level Rise Alternative

The Citizens Committee to Complete the Refuge suggested an alternative to restrict new development in areas projected to be inundated by 4.9 feet of sea level rise. This alternative would limit the area of developable land in the plan area. Although the majority of growth under the proposed plan would take place outside of a 4.9-foot inundation area, there are areas in the land use growth footprint that have been mapped in this inundation zone. The proposed plan excludes development in high-risk areas, such as Very High Fire Hazards Severity Zones and areas subject to sea level rise, unless mitigated by Strategy EN1.

Strategy EN1 adapts shorelines to withstand 4.9 feet of inundation from both permanent sea level rise and temporary flooding due to king tides and storms. This alternative would not provide a distinct or substantively different approach than the proposed plan because this alternative would restrict development in areas of inundation and the plan would limit growth in these areas unless adaptation strategies are implemented. Additionally, MTC and ABAG have no authority to restrict or prohibit development in certain areas making this alternative infeasible. While the proposed plan can establish the Growth Geographies, it cannot prohibit development in certain areas. Because this alternative would not contribute to a reasonable range of alternatives, it is not identified for further study in the EIR.

4.2.4 Lower Federal Transportation Funding Alternative

The Santa Clara Valley Transportation Authority suggested an alternative that would assume a reduction in federal revenue. This alternative assumes a decline in federal transportation funding, which would impact investment decisions. Each of the alternatives is constrained by the same planning assumptions as the proposed plan and maintain the same regional growth forecasts—population, employment, households—and maintain the same forecast of reasonably available transportation revenues. Significantly altering these planning assumptions would hinder the ability to assess how different strategies achieve the plan's objectives. In addition, Alternative 1 and the No Project Alternative (discussed below) have smaller transportation footprints than the proposed plan, and the proposed plan's investment approach already reflects financial constraints, relying on a forecast of reasonably available revenues. Because this alternative would not contribute to a reasonable range of alternatives, it is not identified for further study in the EIR.

4.3 ALTERNATIVES SELECTED FOR DETAILED ANALYSIS

The proposed plan's core approach for leveraging the plan's strategies is "focused growth" in existing communities along the existing transportation network, as well as in communities with well-resourced schools and easy access to jobs, parks, and other amenities. This approach is evidenced by the descriptions and general locations of the Growth Geographies described below. This focused growth approach helps achieve key regional goals by building upon existing community characteristics and leveraging existing infrastructure while reducing effects on areas with less development. The proposed plan designates specific geographic areas—known as Growth Geographies—in order to guide where future household and job growth would be focused under the proposed plan's strategies over the next 25 years. The Growth Geographies are a mix of (a) areas designated by local jurisdictions—Priority Development Areas (PDAs) and Priority Production Areas (PPAs)—and (b) regionally-identified areas defined by criteria related to transit service and access to opportunity: Transit-Rich Areas (TRAs) and High-Resource Areas (HRAs).

The following alternatives to the proposed plan are analyzed in this EIR:

- No Project Alternative,
- Alternative 1: No New Highway Capacity and Transit Reinvestment Alternative, and
- Alternative 2: Transit-Oriented Communities (TOC) Growth Focus Alternative.

Similar to the proposed plan, the alternatives are defined by a unique set of strategies across the four elements—transportation, housing, the economy, and the environment—to accommodate future growth. These differences in strategies result in different future conditions, including forecasted development pattern ("land use growth footprint"), sea level rise adaptation projects ("sea level rise adaptation footprint"), and transportation projects ("transportation projects footprint"). Each of the alternatives is

constrained by the same planning assumptions as the proposed plan and maintain the same regional growth forecasts—population, employment, households, and housing units—and maintains the same forecast of reasonably available transportation revenues. These planning assumptions are considered exogenous factors and ensure the alternatives analysis provides an "apples to apples" comparison with the proposed plan. These alternatives represent a reasonable range of alternatives to the proposed plan. A comparison of the performance of the alternatives is presented in Section 4.4, "Alternatives Comparisons."

4.3.1 No Project Alternative

Analysis of the No Project Alternative is required under CEQA (CEQA Guidelines Section 15126.6[e]). The purpose of the No Project Alternative is to allow a comparison of the environmental impacts of approving the proposed project with the effects of not approving it. This alternative represents a future land use pattern and a more limited set of transportation and resilience projects if the proposed plan is not adopted.

Under the No Project Alternative, growth is assumed to occur consistent with local general plans and zoning without an adopted RTP/SCS, and assumes no new regionally significant transportation projects or sea level rise adaptation projects beyond those currently under construction or those that have both full funding and environmental clearance ("committed"). This No Project Alternative represents a realistic scenario for what would occur if Plan Bay Area 2050+ is not adopted, as compared to a no project alternative that would include continuation of Plan Bay Area 2050. If Plan Bay Area 2050+ is not adopted, the region would lose the ability to move forward with most new transportation projects, since federal funding could not be committed without an approved plan. While some basic safety and maintenance projects could continue, regionally significant projects from the previous plan that are not yet fully funded would be put on hold. Without the ability to direct future investments, the region would also lose momentum for encouraging focused growth in communities. Under the No Project Alternative, housing growth would be more dispersed, while job growth would be slightly more concentrated in San Francisco and the northern portion of the Bay Area. In comparison to the proposed plan, the No Project Alternative would result in higher household growth primarily in Contra Costa, Napa, and Santa Clara Counties, with higher job growth in San Francisco, Alameda, Contra Costa, Marin, Napa, and Sonoma Counties.

NO PROJECT ALTERNATIVE: TRANSPORTATION MODELING ASSUMPTIONS

The No Project Alternative includes substantially lower investments for transportation strategies than the proposed plan, since fewer transportation improvements could move forward. It does not advance the strategies included in the proposed plan, such as all-lane tolling, timed transfers at key nodes, or reduced speed limits, and it assumes implementation of only committed regionally significant transportation projects. This alternative would result in a substantially smaller transportation projects footprint than the proposed plan.

NO PROJECT ALTERNATIVE: HOUSING AND ECONOMY MODELING ASSUMPTIONS

Unlike the proposed plan, the No Project Alternative includes no regional strategies to focus growth in specific geographic areas in the region. Instead, growth would occur consistent with current general plans and zoning, and without consideration of a consolidated approach that considers all nine counties and 101 cities in the Bay Area.

NO PROJECT ALTERNATIVE: ENVIRONMENT MODELING ASSUMPTIONS

The No Project Alternative includes substantially lower funding for environment strategies than the proposed plan because it funds only committed resilience investments. This alternative would result in less construction of sea level rise adaptation projects and subsequently a substantially smaller sea level rise adaptation projects footprint than the proposed plan. As a result, communities at risk without committed investments would be inundated by rising sea levels. At the same time, local jurisdictions would be anticipated to expand urban growth boundaries in line with historical growth rates, increasing the land use growth footprint.

4.3.2 Alternative 1: No New Highway and Transit Reinvestment Alternative

The No New Highway Capacity and Transit Reinvestment Alternative (Alternative 1) would retain the housing, economy, and environment strategies included in the proposed plan. Under this alternative, modifications are limited to the plan's transportation strategies, specifically through the removal of regionally significant roadway expansion and extension projects under Strategies T6, T7, T8, and T11. These projects include general purpose freeway lanes, auxiliary lanes, high-occupancy vehicle (HOV) lanes, express lanes, major interchange improvements involving auxiliary lanes, and principal arterial expansions. Funding previously allocated to these roadway projects would instead be redirected to support increased transit service across Bay Area transit operators. This alternative prioritizes transit-focused investments to create a more connected and affordable Bay Area. By shifting from highway expansion to improved transit, it enhances access to opportunity, reduces reliance on automobile travel, and lowers greenhouse gas emissions—supporting a healthy environment. While maintaining the proposed plan's land use framework, this alternative positions transit as the core of regional mobility, helping to foster a more diverse and vibrant region where all residents can thrive.

The No New Highway Capacity and Transit Reinvestment Alternative modifies the following transportation strategies in the proposed plan, as follows:

- **Modify Strategy T6, Modernize Freeways and Interchanges:** Removes $0.5 billion across five projects for interchange expansions that increase freeway capacity, such as adding auxiliary lanes.
- **Strategy: T7, Expand Freeways and Mitigate Impacts:** Eliminates $3.7 billion in funding across 10 freeway expansion projects, including auxiliary lanes, HOV lanes, express lanes, and associated funding for project development and VMT mitigation strategies.
- **Modify Strategy T8, Advance Other Regional Programs and Local Priorities:** Removes $2.1 billion across 27 local principal arterial expansion projects, including roadway widening and extensions, as well as associated funding for VMT mitigation strategies.
- **Modify Strategy T11, Enhance Transit Frequency, Capacity, and Reliability:** Adds $6.2 billion in funding to increase transit frequency on moderate- to high-ridership routes with at least 15-minute service during the a.m.-peak, midday, and p.m.-peak periods—by 50% from 2025 to 2035, and by an additional 35% from 2036 to 2050.

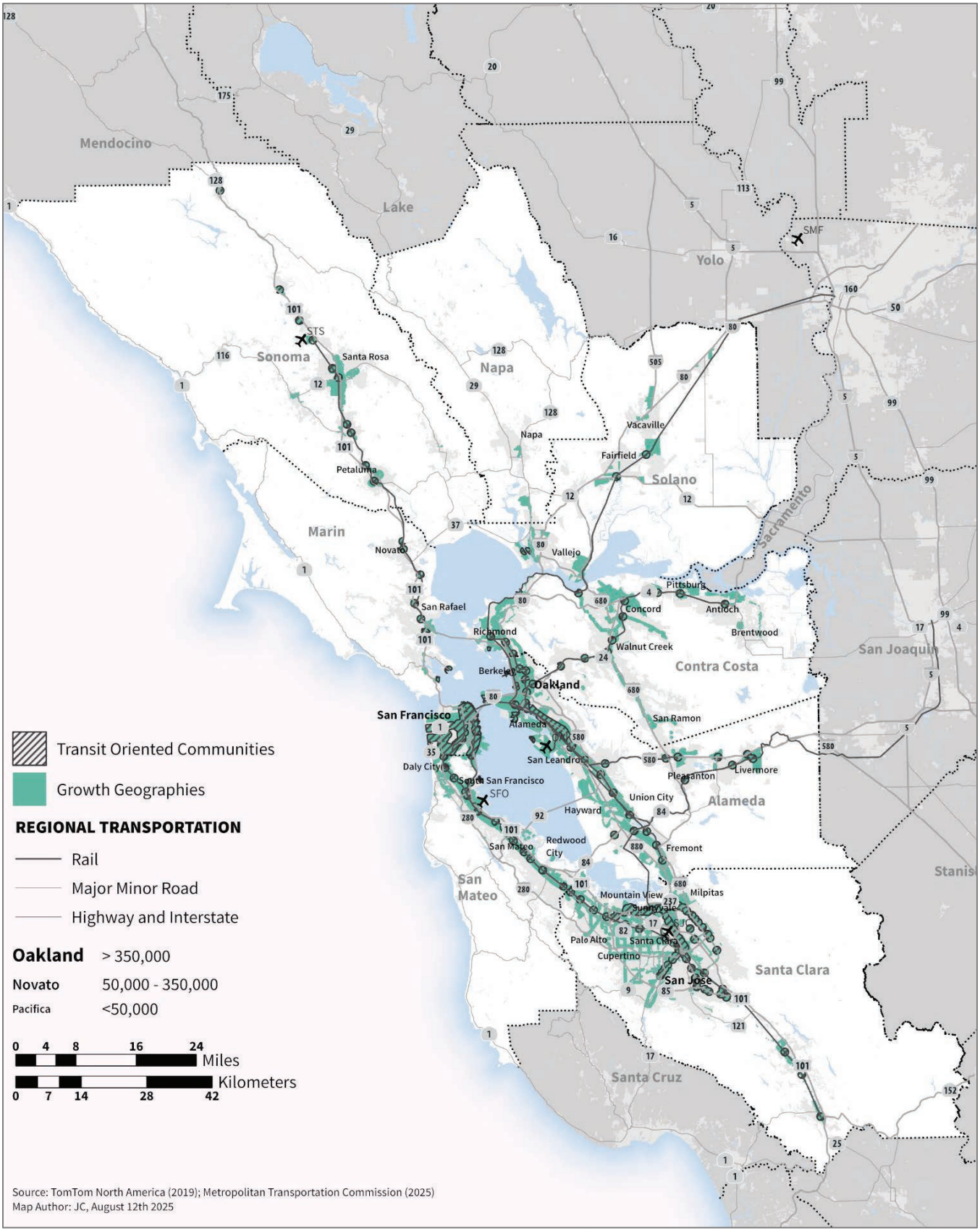
4.3.3 Alternative 2: TOC Growth Focus Alternative

The TOC Growth Focus Alternative (Alternative 2) would retain all strategies in the proposed plan, including those related to transportation, housing, the economy, and the environment. However, unlike the proposed plan, which applies its housing and economy strategies across a broad range of Growth Geographies (see Chapter 2, "Project Description"), this alternative would focus application of these strategies primarily within TOC Policy Areas, thus increasing development capacity in areas close to major transit infrastructure. TOC Policy Areas are defined in MTC Resolution No. 4530 as the areas within a half-mile radius surrounding existing and planned fixed-guideway transit stations—including regional rail, commuter rail, light rail, bus rapid transit, and ferry terminals—based on proximity to transit rather than the designation given by local jurisdictions. By focusing application of housing and economy strategies in TOC Policy Areas, this alternative targets the plan's growth-supportive land use and economic development efforts in areas most directly served by major transit infrastructure. Additionally, this alternative seeks to improve the effectiveness of existing and planned transit services, reduce reliance on automobile travel, and encourage more compact, walkable, and transit-supportive communities. These changes support a connected and healthy Bay Area by lowering GHG emissions and improving access to reliable transportation, while also fostering diverse and vibrant communities where more residents can live near high-quality transit.

The TOC Growth Focus Alternative modifies the following housing and economy strategies in the proposed plan, as follows:

- **Modify H2 Preserve Existing Affordable Housing:** Uses TOC Policy Areas in place of TRAs in the location criteria for housing preservation eligibility.
- **Modify Strategy H3, Allow a Greater Mix of Housing Densities and Types in Growth Geographies:** Further increases the allowable development capacity in TOC Policy Areas in place of other non-TOC areas, such as PDAs and HRAs.
- **Modify H5 Integrate Affordable Housing into All Major Housing Projects:** Uses TOC Policy Areas in place of TRAs in the criteria for determining affordable housing percentage levels.
- **Modify Strategy EC4, Allow a Greater Mix of Land Uses and Densities in Growth Geographies:** Further increases the allowable development capacity in TOC Policy Areas.

Figure 4-1: Growth Geographies and TOC Policy Areas



Source: Figure provided by MTC and ABAG, adopted by Ascent 2025.

4.4 ALTERNATIVES COMPARISONS

4.4.1 Comparative Demographic Forecasts

All of the alternatives are designed to accommodate the same population and employment in the year 2050 based on the plan's final regional growth forecast, with varying locational distributions of growth. Growth forecasts from 2020 through 2050 are provided in **Table 4-1**.

Table 4-1: Regional Growth Forecast of Population, Employment, Households, and Housing Units

	Year 2020	Year 2050	Change from 2020 to 2050
Population	7,749,000	9,586,000	1,837,000
Households	2,798,000	3,796,000	998,000
Housing Units	2,875,000	3,996,000	1,121,000
Jobs	4,025,000	5,436,000	1,411,000

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.4.2 Households

Table 4-2 compares the household distribution in the year 2050 for each alternative, along with each county's proportion of the region's population, as modeled by Bay Area UrbanSim 2.6 after taking each alternative's strategies into account. The household growth by Growth Geography is presented in **Table 4-3.** The Growth Geographies guide where future household and job growth would be focused over the next 25 years. In all alternatives, priority development areas have the majority of the region's households in the year 2050.

At the county scale, household growth patterns would remain similar to the 2020 conditions. That is, the greatest number of households would be in Santa Clara, Alameda, San Francisco, and Contra Costa Counties. Distribution of households would change slightly among the alternatives. Although each county is projected to gain households between 2020 and 2050 in every alternative, notable differences in the land use pattern, compared to the proposed plan, are summarized as follows:

- Under the No Project Alternative, there would be a slightly higher number of households in Contra Costa, Napa, Santa Clara and Solano Counties and a slightly lower number in Alameda, Marin, San Francisco, San Mateo, and Sonoma Counties.
- Under Alternative 1, housing would be distributed the same as the proposed plan because Alternative 1 maintains the same growth pattern as the proposed plan.
- Under Alternative 2, a slightly greater number of households would be in Alameda, San Francisco, and San Mateo Counties and a slightly smaller number in Contra Costa, Napa, Santa Clara, Solano, and Sonoma Counties because housing growth would be concentrated in areas closest to major transit infrastructure.

The relative location of households and employment centers in the region informs the characteristics of residents, such as automobile ownership, based on numerous factors, including access to transit, income, and parking availability. The results of the different growth patterns on automobile ownership are included below in **Table 4-4**.

Table 4-2: Forecasted Households by Alternative and County in 2050

County	Proposed Plan		No Project Alternative		Alternative 1		Alternative 2	
	Total	Share	Total	Share	Total	Share	Total	Share
Alameda	841,000	22%	763,000	20%	841,000	22%	847,000	22%
Contra Costa	492,000	13%	529,000	14%	492,000	13%	478,000	13%
Marin	131,000	3%	129,000	3%	131,000	3%	131,000	3%
Napa	56,000	1%	61,000	2%	56,000	1%	55,000	1%
San Francisco	579,000	15%	515,000	14%	579,000	15%	622,000	16%
San Mateo	394,000	10%	354,000	9%	394,000	10%	404,000	11%
Santa Clara	935,000	25%	1,062,000	28%	935,000	25%	894,000	24%
Solano	153,000	4%	174,000	5%	153,000	4%	151,000	4%
Sonoma	214,000	6%	209,000	6%	214,000	6%	213,000	6%
Regional Total	3,796,000	100%	3,796,000	100%	3,796,000	100%	3,796,000	100%

Note: The number of forecasted households is rounded. Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-3: Forecasted Households by Growth Geography by Alternative in 2050

Growth Geography	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Priority Development Area	72%	54%	72%	76%
Priority Production Area	0%	1%	0%	0%
High-Resource Area	31%	32%	31%	29%
High-Resource Area and Transit-Rich Area	26%	14%	26%	25%
Transit-Rich Area	81%	49%	81%	86%
TOC Policy Area	61%	39%	61%	68%
All Growth Geographies	96%	66%	96%	96%

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-4: Forecasted Household Automobile Ownership by Alternative and County in 2050

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Households with zero automobiles	13%	12%	14%	14%
Households with one automobile	33%	34%	32%	33%
Households with multiple automobiles	54%	55%	54%	53%
Average vehicles per household	1.45	1.46	1.45	1.44

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.4.3 Jobs

Similar to population and household growth, the alternatives accommodate the same number of jobs in the year 2050. **Table 4-5** shows the projected job distribution by county for each alternative. Job growth by Growth Geography is presented in **Table 4-6.** In all alternatives, PDAs have the majority of the region's jobs in the year 2050. With the exception of San Mateo, Santa Clara, Sonoma, and Solano Counties, all

other counties gain jobs in every alternative. Notable differences in the growth pattern, compared to the proposed plan, are summarized as follows:

- Under the No Project Alternative, a slightly greater number of jobs would be located in Alameda, Contra Costa, Marin, Napa, San Francisco, and Sonoma Counties, and a slightly lower number in San Mateo, Santa Clara, and Solano Counties.
- Under Alternative 1, jobs would be distributed the same as the proposed plan because Alternative 1 maintains the same growth pattern as the proposed plan.
- Under Alternative 2, a slightly greater number of jobs would be located in Alameda, Contra Costa, Marin, San Francisco, and San Mateo Counties, and a slightly lower number in Santa Clara, Solano, and Sonoma Counties.

Table 4-5: Forecasted Employment Counts by Alternative and County in 2050

County	Proposed Plan		No Project Alternative		Alternative 1		Alternative 2	
	Total	Share	Total	Share	Total	Share	Total	Share
Alameda	1,109,000	20%	1,139,000	21%	1,109,000	20%	1,117,000	21%
Contra Costa	526,000	10%	528,000	10%	526,000	10%	533,000	10%
Marin	126,000	2%	135,000	2%	126,000	2%	130,000	2%
Napa	72,000	1%	75,000	1%	72,000	1%	72,000	1%
San Francisco	960,000	18%	986,000	18%	960,000	18%	967,000	18%
San Mateo	593,000	11%	588,000	11%	593,000	11%	602,000	11%
Santa Clara	1,621,000	30%	1,566,000	29%	1,621,000	30%	1,605,000	30%
Solano	160,000	3%	149,000	3%	160,000	3%	150,000	3%
Sonoma	268,000	5%	269,000	5%	268,000	5%	259,000	5%
Regional total	5,436,000	100%	5,436,000	100%	5,436,000	100%	5,436,000	100%

Note: The number of forecasted jobs is rounded.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-6: Forecasted Employment by Growth Geography by Alternative in 2050

Growth Geography	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Priority Development Area	52%	54%	52%	56%
Priority Production Area	8%	6%	8%	7%
High-Resource Area	26%	29%	26%	27%
High-Resource Area and Transit-Rich Area	12%	15%	12%	13%
Transit-Rich Area	50%	52%	50%	53%
TOC Policy Area	46%	44%	46%	47%
All Growth Geographies	72%	75%	96%	76%

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.4.4 Land Use Growth Footprint

The land use growth footprint would differ among the alternatives. As shown in **Table 4-7**, the total land use growth footprint area, land use growth within Growth Geographies, and overall increase in developed land (i.e., projected development in areas not currently considered developed, according to the Farmland Mapping and Monitoring Program) also vary among the alternatives.

Table 4-7: Acreage of Land Use Growth Footprint by Alternative and County

County	Land Use Growth Footprint	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Alameda	Total Area	8,500	6,800	8,500	7,500
	Within Growth Geography	6,700	3,400	6,700	5,900
	New Developed Land	770	1,500	770	730
Contra Costa	Total Area	7,700	18,000	7,800	7,000
	Within Growth Geography	4,100	4,000	4,000	3,600
	New Developed Land	4,100	10,900	4,100	3,800
Marin	Total Area	910	3,400	900	760
	Within Growth Geography	620	260	620	480
	New Developed Land	130	2,400	130	100
Napa	Total Area	870	1,200	870	880
	Within Growth Geography	460	340	460	440
	New Developed Land	430	390	430	500
San Francisco	Total Area	2,800	1,800	2,800	2,900
	Within Growth Geography	2,800	1,700	2,700	2,900
	New Developed Land	0	0	0	0
San Mateo	Total Area	2,400	3,200	2,400	2,000
	Within Growth Geography	1,900	1,100	1,900	1,500
	New Developed Land	60	710	60	40
Santa Clara	Total Area	7,140	14,800	7,100	5,200
	Within Growth Geography	5,800	6,100	5,800	4,000
	New Developed Land	580	4,400	580	540
Solano	Total Area	2,800	4,800	2,800	2,800
	Within Growth Geography	2,300	850	2,300	2,300
	New Developed Land	1,600	3,300	1,600	1,500
Sonoma	Total Area	1,500	2,000	1,500	1,500
	Within Growth Geography	690	650	690	600
	New Developed Land	430	700	430	500
Regional	Total Area	34,700	56,100	34,700	30,400
	Within Growth Geography	25,400	18,300	25,400	21,600
	New Developed Land	8,100	24,400	8,100	7,700

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum because of independent rounding.

Acreage that results in "new developed land" indicates the area of the land use growth footprint for the alternative that would be located within areas not currently designated Urban Built-Up according the Farmland Mapping and Monitoring Program.

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.4.5 Sea Level Rise Adaptation Projects Footprint

The relative comparison of the sea level rise adaptation projects footprint acreage by county associated with each alternative is provided in **Table 4-8**.

Table 4-8 Acreage of Sea Level Rise Adaptation Projects Footprint by Alternative

County	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Alameda	8,700	720	8,700	8,700
Contra Costa	5,200	420	5,200	5,200
Marin	16,600	2,000	16,600	16,600
Napa	4,000	1,400	4,000	4,000
San Francisco	2,000	260	2,000	2,000
San Mateo	8,800	70	8,800	8,800
Santa Clara	6,400	2,400	6,400	6,400
Solano	7,400	1,500	7,400	7,400
Sonoma	25,000	0	25,000	25,000
Regional total	84,200	8,800	84,200	84,200

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.4.6 Transportation Strategies and Projects Footprint

As shown in **Table 4-9**, there would be substantially less investment in roadway-lane miles under the No Project Alternative and Alternative 1 compared to the proposed plan. In terms of total daily transit seat-miles, there would be a greater investment in the capacity of daily transit seat-miles under Alternative 1 compared to the proposed plan, and substantially lower added capacity of daily transit seat-miles under the No Project Alternative.

Table 4-9: Added Transportation System Capacity by Alternative

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Freeway Lane Miles	5,200	5,000	5,100	5,200
Priced Freeway Lane Miles	100%	16%	100%	100%
Expressway Lane Miles	1,100	1,100	1,100	1,100
Arterial Lane Miles	8,600	8,600	8,500	8,600
Collector Lane Miles	5,500	5,500	5,500	5,500
Total Roadway Lane Miles	20,400	20,200	20,200	20,400
Daily Local Bus Seat Miles	12,786,000	9,486,500	14,324,000	12,786,000
Daily Express Bus Seat Miles	2,891,000	1,579,000	4,210,000	2,891,000
Daily Light Rail Seat Miles	3,173,000	1,964,000	3,325,000	3,173,000
Daily Heavy Rail Seat Miles	21,199,000	12,523,000	21,617,000	21,199,000
Daily Commuter Rail Seat Miles	7,322,000	5,150,000	9,876,000	7,322,000
Daily Ferry Seat Miles	2,149,000	813,600	2,920,000	2,149,000
Total Daily Transit Seat Miles	49,520,000	31,516,000	56,570,000	49,520,000

Notes: Freeway line mileage reflects mainline travel lanes and does not include on/off ramps. Priced freeway lane mileage include toll bridge corridors, express lanes corridors, and other usage-based pricing facilities. Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

The relative comparison of transportation projects acreage by county associated with each alternative is provided in **Table 4-10**.

Table 4-10: Acreage of Transportation Projects Footprint by Alternative

County	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Alameda	2,700	290	2,500	2,700
Contra Costa	1,100	0	670	1,100
Marin	140	130	140	140
Napa	3	0	0	3
San Francisco	140	1	140	140
San Mateo	800	0	800	800
Santa Clara	1,900	70	1,200	1,900
Solano	880	470	690	880
Sonoma	760	3	700	760
Regional total	8,500	970	6,800	8,500

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 have been rounded to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

4.5 COMPARATIVE IMPACT ANALYSIS OF ALTERNATIVES

The following discussion provides an analysis of the impacts of the alternatives compared to the proposed plan. Quantified data is provided to the extent it is available. Each of these alternatives is intended to accommodate projected growth, sea level rise adaptation projects, and transportation projects and programs, with one alternative (No Project Alternative) reflecting forecasted future conditions without an adopted plan in place and the other alternatives reflecting various modifications to the proposed plan. The format of this analysis is structured to examine how impacts from each alternative would compare to impacts of the proposed plan. The analysis compares the impacts of each alternative to the proposed plan assuming no mitigation is in place. Mitigation measures presented in the impact discussions for the proposed plan should be implemented for any alternative selected that would result in similar impacts to reduce the adverse effect of significant impacts. However, MTC and ABAG cannot require local implementing agencies to adopt mitigation measures, and it is ultimately the responsibility of the implementing agencies to adopt mitigation.

Where quantified information or analysis is provided, the same source or method was followed as was used for presenting information and analysis on the proposed plan (see Section 3.1, "Approach to the Analysis"). The analysis compares the potential effects of the land use growth footprint, sea level rise adaptation projects footprint, and the transportation projects footprint associated with each alternative.

4.5.1 Approach to Assessing Alternatives

Assessment of the alternatives in comparison to the proposed plan involved modeling to develop the land use growth footprint and traffic-related outputs. These efforts are described below.

MODELING

See Section 2.3.3, "Analysis Tools," for a detailed overview of the modeling methodology.

LAND USE FORECASTING MODEL: BAY AREA URBANSIM 2.6

MTC and ABAG developed the regional growth forecast—forecasted numbers of population, jobs, households, and housing units—for 2050, as described in Section 2.3, "Planning Assumptions." Bay Area

UrbanSim 2.6, the regional land use forecasting model, relied on these long-range forecasts as model inputs. According to the assumed levels of household and job growth in the region, Bay Area UrbanSim analyzed the impact of economic, housing, and transportation strategies for each of the alternatives' forecasted development pattern ("land use growth footprint").

TRAVEL DEMAND FORECASTING MODEL: TRAVEL MODEL 1.6

The MTC demand model, Travel Model 1.6, is a regional activity-based travel model for the San Francisco Bay Area. Integrating the effects of transportation strategies and associated investments, the model produced all of the key outputs used in assessing the significance of transportation impacts for all alternatives (e.g., VMT).

INTEGRATION OF TRAVEL MODEL 1.6 AND BAY AREA URBANSIM 2.6

For the proposed plan, Bay Area UrbanSim 2.6 and Travel Model 1.6 were applied within an integrated framework to capture the relationship between land use and transportation. UrbanSim 2.6 simulates where households and jobs are likely to locate over time, while the Travel Model 1.6 projects how people travel throughout the region based on that land use pattern.

For calculations relying on outputs from Travel Model 1.6 and population totals (i.e., per capita VMT or per capita energy use), model-simulated population levels were used to ensure consistency. Simulated population may be slightly different from overall population forecasts for the proposed plan and alternatives because of slight variability in modeling tools. Similarly, for calculations relying on household or housing unit totals, model-simulated totals from UrbanSim 2.6 were used to ensure consistency. Model-simulated population levels, households, and housing units may be slightly different from the regional growth forecast because of slight variability in modeling tools.

4.5.2 Aesthetics and Visual Resources

NO PROJECT ALTERNATIVE

Under the No Project Alternative, the forecasted development pattern, sea level rise adaptation projects, and transportation projects would not substantially change the existing scenic vistas in the Bay Area at the regional scale because views of landforms and constructed features would generally remain similar to the existing conditions. However, development would sprawl into existing undeveloped areas including areas of relatively higher topography, which are visible to larger viewsheds than flatter areas. Impacts to scenic vistas would be substantial from discrete locations due to the presence of construction-related activities and the introduction of new features in a localized viewshed. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). With respect to planned infrastructure, the No Project Alternative would have a substantially reduced number of sea level rise adaptation and transportation projects, which would reduce the footprint related to these types of projects and require less construction. Under the No Project Alternative, modeling by MTC indicates that, without any adaptation projects and an assumed 2-foot sea level rise, the greatest degree of inundation would include inland areas along the bayside south of State Route (SR) 92, the San Francisco International Airport, the Oakland International Airport, lands surrounding SR 37, and areas around Suisun Bay. Implementation of sea level rise adaptation projects would reduce inundation throughout the plan area but would do so by elevating some existing roadways and constructing vertical levees, which in some places would require considerable construction that could substantially affect scenic vistas. The No Project Alternative would result in greater levels of sea level rise impacts, but fewer sea level rise

adaptation projects than under the proposed plan. Overall, implementation of the No Project Alternative would impact more Bay Area acreage than the proposed plan; thus, this impact would be significant and unavoidable for the reasons described under Impact AES-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan.

Construction of developments within view of scenic highways would generally cause similar types of short-term visual impacts resulting from construction equipment and scaffolding, temporary lighting, and exposed excavation and slope faces. However, the area of development would be greater under the No Project Alternative than the proposed plan due to a larger land use growth footprint. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). Modeling by MTC indicates that parts of the State scenic highways SR 37 and SR 1 in Marin County would be inundated due to sea level rise by 2050. While impacts to scenic resources within a State scenic highway generally pertain to nearby changes involving trees, rock outcroppings, and historical buildings within view of an identified roadway, scenic highways could potentially be inundated and unusable under the No Project Alternative. In contrast, the proposed plan would include projects that would allow for continued use of affected roadways while surrounding views are affected. This impact would be significant and unavoidable for the reasons described under Impact AES-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area would be developed.

Projected development has the potential to cause changes that could alter visual character. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). In contrast, as it relates to transportation projects, the No Project Alternative would include a decreased number of transportation projects that could affect visual character. In addition, modeling by MTC indicates that without any adaptation projects and a forecast with 98% confidence that sea level rise would be 2 feet or more, the greatest degree of inundation would include inland areas along the bayside south of SR 92, the San Francisco International Airport, the Oakland International Airport, lands surrounding SR 37, and areas around Suisun Bay. Inundation could lead to abandonment and destruction of existing business districts, homes, and other types of developed areas. Generally, the effect of sea level rise could affect the visual character of localized areas by rendering them undevelopable or otherwise unusable. In contrast, the proposed plan would include sea level rise adaptation projects that would generally allow for the continued use of developed lands; however, these projects may substantially alter undeveloped lands depending on the type of infrastructure improvement. Regardless, because the No Project Alternative would substantially increase the amount of land that would be converted from undeveloped to developed uses, this impact would be significant and unavoidable for the reasons described under Impact AES-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of currently undeveloped land would be developed.

Projected development of new residential or commercial structures would involve new sources of light and glare, which would cover a greater area of land under the No Project Alternative compared to the proposed plan. However, the No Project Alternative includes fewer transportation projects than the proposed plan and would thus make a smaller contribution to regional light and glare impacts. In terms of sea level rise adaptation impacts, both the No Project and proposed plan would result in minimal sources of new light and glare due to the limited need for lighting of resiliency infrastructure. Overall, as shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres), which would be substantially greater than any reduced effects from the limited number of new transportation projects. This impact would be significant and unavoidable for the reasons described under Impact AES-4, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of currently undeveloped land would be developed.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Impacts to scenic vistas would be substantial from discrete locations due to the presence of construction-related activities and the introduction of new features in a localized viewshed. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). Additionally, Alternative 1 would have the same sea level rise adaptation projects as the proposed plan and thus would result in the same level of environmental effects. Alternative 1 would have the same degree of changes to undeveloped areas compared to the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact AES-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Construction of developments within view of scenic highways would generally cause similar types of short-term visual impacts resulting from construction equipment and scaffolding, temporary lighting, and exposed excavation and slope faces. As noted above and shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses as the proposed plan (8,100 acres). Impacts to scenic resources within a State scenic highway generally pertain to nearby changes involving trees, rock outcroppings, and historical buildings within view of an identified roadway. The same areas along scenic highways would be changed under Alternative 1 as with the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact AES-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the area of projected growth would be the same.

Projected development has the potential to cause changes that could alter visual character. As shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses as the proposed plan (8,100 acres). Roadway inundation due to sea level rise may affect the visual character or quality of public views in future conditions; however, development of adaptation projects included in the proposed plan could require tree removal or earthwork, which could also alter or degrade existing visual quality in the region by introducing new built elements in existing natural landscapes or increasing the vertical profile of existing infrastructure. Regardless, Alternative 1 would result in a similar area of land converted from undeveloped to developed uses, compared to the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact AES-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because a similar area of currently undeveloped land would be developed.

Development and transportation projects could create new substantial sources of light and glare at the regional scale that would cause a public hazard, disrupt scenic vistas, and brighten the night sky. As noted, and shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses as with the proposed plan (8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact AES-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because a similar area of undeveloped land would be developed.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Impacts to scenic vistas would be substantial from discrete locations due to the presence of construction-related activities and the introduction of new features in a localized viewshed. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a lesser area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). In terms of sea level rise adaptation projects, both the proposed plan and Alternative 2 contain the same list of projects and would result in the same level of environmental effects. Overall, Alternative 2 would have reduced impacts to undeveloped areas compared to the proposed plan. This impact would be significant

and unavoidable for the reasons described under Impact AES-1, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan.

Construction of developments within view of scenic highways would generally cause similar types of short-term visual impacts resulting from construction equipment and scaffolding, temporary lighting, and exposed excavation and slope faces. As shown in **Table 4-7**, Alternative 2 would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). In terms of sea level rise adaptation projects, both the proposed plan and Alternative 2 contain the same list of projects and would result in the same level of environmental effects. This impact would be significant and unavoidable for the reasons described under Impact AES-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because the area of projected growth would be decreased slightly.

Projected development has the potential to cause changes that could alter visual character. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a lesser area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). In terms of sea level rise adaptation projects, both the proposed plan and Alternative 2 contain the same projected infrastructure and would result in the same level of environmental effects. Impacts on visual character would be significant and unavoidable for the reasons described under Impact AES-3, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of currently undeveloped land would be developed.

Development and transportation projects could create new substantial sources of light and glare at the regional scale that cause a public hazard, disrupt scenic vistas, and brighten the night sky. As shown in **Table 4-7**, Alternative 2 would result in a smaller area of land being converted from undeveloped to developed uses when compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact AES-4, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of currently undeveloped land would be developed.

4.5.3 Agriculture and Forestry Resources

Table 4-11 provides a summary of impacted Prime Farmland, Unique Farmland, and Farmland of Statewide Importance (collectively referred to as "Farmland") acreage comparison between the proposed plan and alternatives. **Table 4-12** shows the impacted forest land acreage comparison between the proposed plan and alternatives. The indirect impacts related to agriculture and forestry resources are discussed qualitatively below.

Table 4-11: Summary of Farmland Acreage by Plan Alternative

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total
Proposed Plan	820	930	200	1,900
No Project Alternative	3,100	40	6	3,100
Alternative 1	820	930	180	1,900
Alternative 2	820	930	200	2,000

Notes: Farmland is defined as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Data is presented as acreage of Farmland. Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).

Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-12: Affected Forest Land Acreage by Plan Alternative

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total
Proposed Plan	300	800	10	1,100
No Project Alternative	4,300	10	<1	4,300
Alternative 1	300	800	10	1,100
Alternative 2	100	800	10	900

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Sources: US Department of Agriculture 2020; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects has the potential to convert Farmland to other uses. The conversion may conflict with a Williamson Act contract or land zoned for agricultural use. As shown in **Table 4-11**, the No Project Alternative would convert more Farmland to nonagricultural uses compared to the proposed plan (3,100 acres versus 1,900 acres). This impact would be significant and unavoidable for the reasons described under Impact AGF-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because more Farmland would be affected.

Although the No Project Alternative would include fewer sea level rise and transportation projects compared to the proposed plan, development of new residential and commercial land uses has the potential to convert forest lands and timberlands to urban uses. The No Project Alternative would convert more forest lands to urban uses compared to the proposed plan (4,300 acres versus 1,100 acres, **Table 4-12**). This impact would be significant and unavoidable for the reasons described under Impact AGF-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because more forest land would be affected.

Anticipated growth under the proposed plan would result in conversion of Farmland to nonagricultural use and conversion of forest land to nonforest use. Lands that remain agricultural but located adjacent to developed uses may feel pressure to develop, as nearby land values increase or as nuisances from urban development spread to agricultural lands. Further, expanded transportation infrastructure capacity and the implementation of sea level rise adaptation projects could remove obstacles to growth in existing agricultural areas. A range of local conservation plans, habitat conservation agencies, and State/federal park–designated areas provide protection for a substantial amount of forest land and agricultural land. However, a substantial amount of land on the urban and suburban fringe is vulnerable to development, if not within the boundaries of protected lands, and faces additional development pressure as adjacent lands are converted from undeveloped to developed uses. Therefore, development projects anticipated to occur under the No Project Alternative could have the potential to cause other changes in the existing environment that could result in conversion of Farmland to nonagricultural use or conversion of forest land to nonforest use. Because the No Project Alternative would have more dispersed growth, pressure to develop on the suburban fringe would be greater for the No Project Alternative compared to the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact AGF-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects have the potential to convert Farmland to other uses. Additionally, the conversion may conflict with a Williamson Act contract or land zoned for agricultural use. The No New Highway

Capacity and Transit Reinvestment Alternative would convert the same amount of Farmland to nonagricultural uses compared to the proposed plan (1,900 acres, **Table 4-11**). This impact would be significant and unavoidable for the reasons described under Impact AGF-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because a same amount of Farmland would be affected.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects have the potential to convert forest lands and timberlands to urban uses. The No New Highway Capacity and Transit Reinvestment Alternative would convert the same amount of forest lands to urban uses compared to the proposed plan (1,100 acres, **Table 4-12**). This impact would be significant and unavoidable for the reasons described under Impact AGF-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because less forest land would be affected.

Anticipated growth under the proposed plan would result in conversion of Farmland to nonagricultural use and conversion of forest land to nonforest use. Lands that remain agricultural but located adjacent to urban uses may feel pressure to develop as nearby land values increase or as nuisances from urban development spread to agricultural lands. Further, expanded transportation infrastructure capacity and the implementation of sea level rise adaptation projects could remove obstacles to growth in existing agricultural areas. A range of local conservation plans, habitat conservation agencies, and State/federal park–designated areas provide protection for a substantial amount of forest land and Farmland. However, a substantial amount of land on the urban and suburban fringe is vulnerable to development, if not within the boundaries of protected lands, and faces additional development pressure as adjacent lands are converted from undeveloped to developed uses. Therefore, development projects anticipated to occur under the proposed plan could have the potential to cause other changes in the existing environment that could result in conversion of Farmland to nonagricultural use or conversion of forest land to nonforest use. Because the pressure to develop on the suburban fringe would be similar between the proposed plan and Alternative 1, this impact would be significant and unavoidable for the reasons described under Impact AGF-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects have the potential to convert Farmland to other uses. Additionally, the conversion may conflict with a Williamson Act contract or land zoned for agricultural use. The TOC Growth Focus Alternative would convert more Farmland to nonagricultural uses compared to the proposed plan (2,000 acres versus 1,900 acres, **Table 4-11**). This impact would be significant and unavoidable for the reasons described under Impact AGF-1, and impacts under Alternative 2 would be **greater** than those that would occur compared to the proposed plan because more Farmland would be affected.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects have the potential to convert forest lands and timberlands to urban uses. The TOC Growth Focus Alternative would convert a smaller area of forest lands to urban uses compared to the proposed plan (900 acres versus 1,100 acres, **Table 4-12**). This impact would be significant and unavoidable for the reasons described under Impact AGF-2, and impacts under Alternative 2 would be **less** than those that would occur compared to the proposed plan because less forest land would be affected.

Anticipated growth under the proposed plan would result in conversion of Farmland to nonagricultural use and conversion of forest land to nonforest use. Lands that remain agricultural but located adjacent to urban uses may feel pressure to develop as nearby land values increase or as nuisances from urban development spread to agricultural lands. Further, expanded transportation infrastructure capacity and the

implementation of sea level rise infrastructure could remove obstacles to growth in existing agricultural areas. A range of local conservation plans, habitat conservation agencies, and State/federal park–designated areas provide protection for a substantial amount of forest land and Farmland. However, a substantial amount of land on the urban and suburban fringe is vulnerable to development, if not within the boundaries of protected lands, and faces additional development pressure as adjacent lands are converted from undeveloped to developed uses. Therefore, development projects anticipated to occur under the TOC Growth Focus Alternative could have the potential to cause other changes in the existing environment that could result in conversion of Farmland to nonagricultural use or conversion of forest land to nonforest use. Because the pressure to develop on the suburban fringe would be similar between the proposed plan and Alternative 2, this impact would be significant and unavoidable for the reasons described under Impact AGF-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

4.5.4 Air Quality

As identified in Section 3.4, "Air Quality," several of California's waivers for mobile source regulations under the Clean Air Act have been rescinded following congressional action. Although the California attorney general has filed lawsuits challenging P.L. No. 119-16 and P.L. No. 119-17, the implications of these laws on the State's capability to enforce its independent fuel economy standards are uncertain at this time because litigation is still pending.

In an effort to account for a range of potential scenarios in regard to whether the State is able to implement its own stricter emissions standards in the future, a range of mobile source emissions estimates were calculated for the proposed plan. Therefore, older emissions models that do not assume termination of gas engine vehicle sales by 2035, for instance, were used to determine project-related impacts. Emissions were calculated using both EMFAC2017 and EMFAC2021, in combination with equivalent model versions of CT-EMFAC (the California Department of Transportation ([Caltrans]) model based on data derived from CARB's EMFAC model and ancillary data sets. See Section 3.4, "Air Quality," for further details regarding the emissions estimation methodology and information regarding the current regulatory setting.

Tables 4-13 and 4-14 provide a summary of exhaust emissions, fine particulate matter ($PM_{2.5}$), and VMT changes in Overburdened Communities and the remainder of the region compared to the existing conditions based on the land use growth footprints using EMFAC2017 and EMFAC2021. **Tables 4-15 and 4-16** show the estimated criteria pollutant emissions for each alternative using EMFAC2017 and EMFAC2021. Calculations emissions performed using EMFAC2017 provide a more conservative estimate of emissions (emissions are higher) compared to EMFAC2021 for most instances because EMFAC2017 includes emissions reduction estimates based on older, less stringent mobile-source emissions regulations. However, in some instances, EMFAC2021 emissions estimates may be greater due to the model's higher estimation of emissions from passenger vehicles. The analysis below bases its discussion of impacts of the proposed plan compared to the alternatives based on the more conservative estimates of emissions. MTC anticipates that emissions modeled using an updated EMFAC2021 that accounts for rescission of California's waivers (once made available by CARB) will fall somewhere within the range of emissions modeled using EMFAC2017 and EMFAC2021. Other air quality impacts are discussed qualitatively below.

Table 4-13: Change in Daily On-Road Mobile Source Exhaust and Total $PM_{2.5}$ Emissions (2023–2050) (EMFAC2021)

County	Overburdened Community Status	Exhaust Emissions				Total $PM_{2.5}$	VMT
		Exhaust Only $PM_{2.5}$	Diesel PM	Benzene	1, 3 Butadiene		
Proposed Plan	Overburdened Community	-46%	-45%	-55%	-51%	19%	22%
	Remainder of Region	-48%	-48%	-54%	-49%	20%	20%
	Total	-48%	-47%	-54%	-50%	20%	21%
No Project Alternative	Overburdened Community	-37%	-31%	-53%	-48%	29%	34%
	Remainder of Region	-38%	-31%	-51%	-46%	32%	37%
	Total	-38%	-31%	-51%	-46%	31%	37%
Alternative 1	Overburdened Community	-47%	-45%	-55%	-51%	19%	21%
	Remainder of Region	-49%	-48%	-54%	-50%	20%	20%
	Total	-48%	-47%	-54%	-50%	19%	20%
Alternative 2	Overburdened Community	-46%	-45%	-55%	-51%	19%	21%
	Remainder of Region	-48%	-48%	-54%	-49%	20%	20%
	Total	-48%	-47%	-54%	-50%	20%	20%

Notes: $PM_{2.5}$ = fine particulate matter, PM = particulate matter; Percentages rounded to nearest whole number; Total $PM_{2.5}$ includes vehicle exhaust, re-entrained road dust, tire and brake wear; Emissions rates from EMFAC2021.
Sources: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025

Table 4-14: Change in Daily On-Road Mobile Source Exhaust and Total $PM_{2.5}$ Emissions (2023–2050) (EMFAC2017)

County	Overburdened Community Status	Exhaust Emissions				Total $PM_{2.5}$	VMT
		Exhaust Only $PM_{2.5}$	Diesel PM	Benzene	1, 3 Butadiene		
Proposed Plan	Overburdened Community	-46%	-45%	-55%	-51%	15%	22%
	Remainder of Region	-48%	-48%	-54%	-49%	17%	20%
	Total	-48%	-47%	-54%	-50%	16%	21%
No Project Alternative	Overburdened Community	-37%	-31%	-53%	-48%	25%	34%
	Remainder of Region	-38%	-31%	-51%	-46%	28%	37%
	Total	-38%	-31%	-51%	-46%	27%	37%
Alternative 1	Overburdened Community	-47%	-45%	-55%	-51%	15%	21%
	Remainder of Region	-49%	-48%	-54%	-50%	16%	20%
	Total	-48%	-47%	-54%	-50%	16%	20%
Alternative 2	Overburdened Community	-46%	-45%	-55%	-51%	15%	21%
	Remainder of Region	-48%	-48%	-54%	-49%	16%	20%
	Total	-48%	-47%	-54%	-50%	16%	20%

Notes: $PM_{2.5}$ = fine particulate matter, PM = particulate matter, VMT = vehicle miles traveled; Percentages rounded to nearest whole number; Total $PM_{2.5}$ includes vehicle exhaust, re-entrained road dust, tire and brake wear; Emissions rates from EMFAC2017.
Sources: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025

Table 4-15: Emission Estimates in 2050 for Criteria Pollutants by Alternative (tons per day) (EMFAC2021)

Pollutant	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
ROG (summertime)	16.8	19.0	16.7	16.8
NO_X (summertime)	16.0	18.1	15.9	16.0
NO_X (wintertime)	19.1	21.5	19.0	19.1
$PM_{2.5}$ (wintertime)	4.7	5.1	4.6	4.6
PM_{10} (wintertime)	24.7	27.2	24.5	24.5
Vehicle Miles Traveled	181,222,800	204,547,500	180,111,900	180,651,200

Note: ROG = reactive organic gas; NO_X = nitrogen oxide; PM = particulate matter. Emissions estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 or EN9 due to modeling limitations. PM emissions include exhaust, brake wear, tire wear, and re-entrained road dust. VMT estimates include intrazonal trips.
Sources: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-16: Emission Estimates in 2050 for Criteria Pollutants by Alternative (tons per day) (EMFAC2017)

Pollutant	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
ROG (summertime)	15.7	17.7	15.6	15.7
NO_X (summertime)	34.5	38.8	34.3	34.4
NO_X (wintertime)	37.8	42.5	37.6	37.7
$PM_{2.5}$ (wintertime)	7.1	7.9	7.1	7.1
PM_{10} (wintertime)	28.9	32.1	28.7	28.8
Vehicle Miles Traveled	181,223,800	204,547,500	180,111,900	180,651,200

Note: ROG = reactive organic gas; NO_X = nitrogen oxide; PM = particulate matter. Emissions estimates are based on average weekday travel activity forecasts and do not reflect expected impacts from Strategies EN8 or EN9 due to modeling limitations. PM emissions include exhaust, brake wear, tire wear, and re-entrained road dust. VMT estimates include intrazonal trips.
Sources: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

The 2017 Clean Air Plan contains a list of programs that protect public health and the climate, with the overall goal of reducing GHG emissions in the Bay Area by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. This framework assumes that State policies, plans, and programs that address air quality and climate protection would be implemented, including SB 375 requirements. Under the No Project Alternative, there would be no adopted RTP/SCS, and reduction goals would not be met (i.e., 19% reduction in VMT emissions from cars and light trucks). Without meeting SB 375 goals, implementation of the 2017 Clean Air Plan would be obstructed, and as a result, this impact would be significant and **greater** than the proposed plan (as discussed in Impact AQ-1). *(This impact would be less than significant under the proposed plan.)*

Impacts associated with construction-related emissions are generally localized in nature. Construction equipment and processes are generally similar among land use, sea level rise adaptation, and transportation projects, and could occur over a short period of time, resulting in substantial construction-related emissions on a daily basis. Because construction-related emissions are generally localized and would occur throughout the region during the planning horizon, this impact would be significant and unavoidable for the reasons described under Impact AQ-2, and impacts under the No Project Alternative would be **similar** to impacts that would occur under the proposed plan.

The area-source emissions of criteria pollutants and precursors would increase over the planning horizon of the plan due to the net increase in land use development projects. As shown in **Table 4-16**, the regional VMT would be greater under the No Project Alternative than under the proposed plan (approximately 205 million versus approximately 181 million). Additionally, as shown in **Table 4-16**, the No Project Alternative would result in higher emissions for all criteria pollutants compared to the proposed plan. Because the No Project Alternative would emit a greater level of criteria air pollutants and VMT than the proposed plan, this impact

would be significant and unavoidable for the reasons described under Impact AQ-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan.

Toxic air contaminants (TAC) Risk Areas are locations where cancer risk levels or $PM_{2.5}$ concentrations are exceeded. In general, TAC Risk Areas tend to occur along high-volume freeways and roadways, high-use rail lines, locations near numerous stationary-sources, and locations where a single stationary-source has very high estimated cancer risk levels or $PM_{2.5}$ concentration. As shown in **Table 4-14**, the total $PM_{2.5}$ emissions in Overburdened Communities under the No Project Alternative would be 10% more than the total $PM_{2.5}$ emissions under the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact AQ-4, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because emissions would be greater.

Development of new residential and commercial uses, sea level rise adaptation projects, and transportation projects could generate odorous diesel exhaust emissions from construction equipment and odors associated with asphalt paving. These types of construction-generated odorous emissions, however, would be temporary and not be generated at any one location for an extended period. Diesel exhaust fumes would also dissipate rapidly from the source with an increase in distance. Therefore, this impact would be less than significant for the reasons described under Impact AQ-5, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because construction-related emissions are generally localized and would occur throughout the region during the planning horizon.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The 2017 Clean Air Plan contains a list of programs that protect public health and the climate, with the overall goal of reducing GHG emissions in the Bay Area by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. This framework assumes that State policies, plans, and programs that address air quality and climate protection would be implemented, including SB 375 requirements. Because the No New Highway Capacity and Transit Reinvestment Alternative would meet the GHG emission reduction goals of SB 375 (i.e., 19% reduction in VMT emissions from cars and light trucks), this impact would be less than significant for the reasons described in Impact AQ-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Construction-related air emissions are generally localized in nature. Construction equipment and processes are generally similar among land use, sea level rise adaptation projects, and transportation projects, and could potentially occur over a short period of time, resulting in substantial construction-related emissions on a daily basis. Because construction-related emissions are generally localized and would occur throughout the region during the planning horizon, this impact would be significant and unavoidable for the reasons described under Impact AQ-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

The area-source emissions of criteria pollutants and precursors would increase over the planning horizon of the plan due to the net increase in land use, sea level rise adaptation projects, and transportation projects. As shown in **Table 4-14**, the increase of regional VMT would be less under Alternative 1 than the proposed plan (21% regional increase versus 22% regional increase). Alternative 1 would emit a lower level of criteria air pollutants than the proposed plan (see **Table 4-16**). Although Alternative 1 would result in a lower VMT than the proposed plan, this impact would be significant and unavoidable for the reasons described under Impact AQ-3. However, impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because emissions would be less.

TAC Risk Areas are locations where cancer risk levels or $PM_{2.5}$ concentrations are exceeded. In general, TAC Risk Areas tend to occur along high-volume freeways and roadways, high-use rail lines, locations near numerous stationary-sources, and locations where a single stationary-source has very high estimated

cancer risk levels or $PM_{2.5}$ concentration. As shown in **Table 4-14**, Alternative 1 and the proposed plan would both result in an 15% increase in total $PM_{2.5}$ in Overburdened Communities. This impact would be significant and unavoidable for the reasons described under Impact AQ-4, and impacts under Alternative 1 would be **similar** those that would occur under the proposed plan because the total $PM_{2.5}$ emissions would be similar in TAC Risk Areas under the proposed plan and Alternative 1.

Development of new residential and commercial uses, sea level rise adaptation projects, and transportation projects could generate odorous diesel exhaust emissions from construction equipment and odors associated with asphalt paving. These types of construction-generated odorous emissions, however, would be temporary and not be generated at any one location for an extended period. Diesel exhaust fumes would also dissipate rapidly from the source with an increase in distance. Therefore, this impact would be less than significant for the reasons described under Impact AQ-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because construction-related emissions are generally localized and would occur throughout the region during the planning horizon.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The 2017 Clean Air Plan contains a list of programs that protect public health and the climate, with the overall goal of reducing GHG emissions in the Bay Area by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. This framework assumes that State policies, plans, and programs that address air quality and climate protection would be implemented, including SB 375 requirements. Because the TOC Growth Focus Alternative would meet the GHG emission reduction goals of SB 375 (i.e., 19% reduction in VMT emissions from cars and light trucks), this impact would be less than significant for the reasons described in Impact AQ-,1 and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Construction-related air emissions are generally localized in nature. Construction equipment and processes are generally similar among land use, sea level rise adaptation, and transportation projects, and could potentially occur over a short period of time, resulting in substantial construction-related emissions on a daily basis. Because construction-related emissions are generally localized and would occur throughout the region during the planning horizon, this impact would be significant and unavoidable for the reasons described under Impact AQ-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

The area-source emissions of criteria pollutants and precursors would increase over the planning horizon of the plan due to the net increase in land use, sea level rise adaptation projects, and transportation projects. As shown in **Table 4-14**, the increase of regional VMT would be less under the TOC Growth Focus Alternative than the proposed plan (20% regional increase versus 21% regional increase). This is because the TOC Growth Focus Alternative would emit a lower level of criteria air pollutants than the proposed plan (see **Table 4-16**). Although Alternative 2 would result in a lower VMT than the proposed plan, this impact would be significant and unavoidable for the reasons described under Impact AQ-3. However, impacts under Alternative 2 would be would be **less** than those that would occur under the proposed plan because emissions would be less.

TAC Risk Areas are locations where cancer risk levels or $PM_{2.5}$ concentrations are exceeded. In general, TAC Risk Areas tend to occur along high-volume freeways and roadways, high-use rail lines, locations near numerous stationary-sources, and locations where a single stationary-source has very high estimated cancer risk levels or $PM_{2.5}$ concentration. As shown in **Table 4-14**, the TOC Growth Focus Alternative and the proposed plan would result in the same increase of in total $PM_{2.5}$ in Overburdened Communities (15%). This impact would be significant and unavoidable for the reasons described under Impact AQ-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan due the same level of $PM_{2.5}$ emissions.

Development of new residential and commercial uses, sea level rise adaptation projects, and transportation projects could generate odorous diesel exhaust emissions from construction equipment and odors associated with asphalt paving. These types of construction-generated odorous emissions, however, would be temporary and not be generated at any one location for an extended period. Diesel exhaust fumes would also dissipate rapidly from the source with an increase in distance. Therefore, this impact would be less than significant for the reasons described under Impact AQ-5, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because construction-related emissions are generally localized and would occur throughout the region during the planning horizon.

4.5.5 Biological Resources

Table 4-17 provides a summary of the affected acreage of wetland features by alternative and **Table 4-18** provides the total acreage of impacted wetlands by alternative. **Table 4-19** provides a summary of affected essential connectivity by alternative. **Table 4-20** provides a summary of the affected key riparian corridors by alternative.

Table 4-17: Affected Acreage of Wetland Features by Alternative

	Alternative	Estuarine and Marine Deepwater	Estuarine and Marine Wetland	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Freshwater Pond	Lake	Riverine
Land Use Growth Footprint	Proposed Plan	40	20	200	50	80	6	120
	No Project Alternative	20	50	190	120	160	20	390
	Alternative 1	40	20	200	50	80	6	120
	Alternative 2	40	10	200	40	70	5	120
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	4,400	16,000	9,100	120	1,900	11,000	1,700
	No Project Alternative	220	650	1,300	-	240	2,200	180
	Alternative 1	4,400	16,000	9,100	120	1,900	11,000	1,700
	Alternative 2	4,400	16,000	9,100	120	1,900	11,000	1,700
Transportation Projects Footprint	Proposed Plan	10	120	30	10	10	20	60
	No Project Alternative	0	<1	2	1	<1	1	6
	Alternative 1	10	90	20	10	6	7	40
	Alternative 2	10	120	30	10	10	20	60

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-18: Total Affected Acreage of Wetland Features

Alternative	Total Affected Acreage of Wetland Features
Proposed Plan	44,900
No Project Alternative	5,800
Alternative 1	44,800
Alternative 2	44,800

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-19: Affected Acreage of Bay Area Critical Linkages by Alternative

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total (acres)
Proposed Plan	8,300	56,100	3,000	67,400
No Project Alternative	21,600	8,600	280	30,500
Alternative 1	8,300	56,100	2,100	66,500
Alternative 2	7,000	56,100	3,000	66,100

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding. Numbers do not include key riparian corridors as they are a linear measurement. Critical linkage features overlap each other, and therefore, the total area of impact is likely overstated.
Source: Data compiled by MTC and ABAG in 2025.

Table 4-20: Affected Key Riparian Corridors by Alternative (feet)

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total
Proposed Plan	40,500	295,200	12,300	348,000
No Project Alternative	106,600	48,900	770	156,300
Alternative 1	40,500	295,200	9,500	345,200
Alternative 2	31,600	295,200	12,300	339,000

Notes: Whole numbers are shown in miles and have been rounded to the nearest 0.1. Critical linkage features overlap each other, and therefore, the total area of impact is likely overstated.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

Impacts on special-status species could occur in areas of new residential and commercial development, sea level rise adaptation projects, and transportation projects footprints. Impacts would include the temporary and permanent removal or conversion of vegetation and habitat necessary for species breeding, feeding, dispersal, or sheltering. Construction and ongoing operations could result in direct mortality of special-status plants and wildlife, entrapment in open trenches, and general disturbance due to noise or vibration during pile-driving, earthmoving, and other construction activities. Construction-generated fugitive dust accumulation on surrounding vegetation and construction-related erosion, runoff, and sedimentation could degrade the quality of adjacent vegetation communities, affecting their ability to support special-status plants and wildlife. Although the No Project Alternative would have fewer sea level rise adaptation and transportation projects, which would reduce the amount of land to be developed related to these types of projects and require less construction, the No Project Alternative would result in more acreage of undeveloped land being converted to developed land. As shown in **Table 4-7**, the No

Project Alternative would result in 24,400 acres of land being converted from undeveloped to developed uses compared to 8,100 acres under proposed plan. Therefore, the No Project Alternative would disturb a greater area of undeveloped land, resulting in the potential for increased impacts on special-status species. This impact would be significant and unavoidable for the reasons described under Impact BIO-1a, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would become developed.

Impacts on critical habitat could include temporary or permanent habitat loss. Degradation of areas that have high conservation value for these species could also occur in association with development where such development occurs in or adjacent to critical habitat through the introduction of night lighting, increases in ambient noise levels, and the introduction of invasive species and predators. Potential impacts on salmonid critical habitat could include stream degradation in association with increased impervious surfaces and surface runoff, decreases in water quality due to increased point-source pollution, and erosion and sedimentation during construction. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). Overall, the No Project Alternative would result in a greater amount of land developed than the proposed plan in areas potentially designated as critical habitat. This impact would be less than significant with mitigation for the reasons described under Impact BIO-1b, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would become developed.

Potential impacts on wetlands include the temporary disturbance or permanent loss of jurisdictional waters, including wetlands; loss or degradation of stream or wetland function; incremental degradation of wetland habitats; and fragmentation of streams and wetlands. Jurisdictional waters in the region vary from relatively small, isolated roadside areas; wet meadows; and vernal pools to major streams and from rivers, bays, and estuaries to tidal, brackish, and freshwater marshes. As shown in **Table 4-17** and **Table 4-18**, primarily because of the reduced sea level rise adaptation projects footprint relative to the proposed plan, a smaller area of wetland features would be affected by the No Project Alternative (5,800 acres) than the proposed plan (44,900 acres). Although the proposed plan includes wetland restoration projects, the acreage of affected wetland in this analysis considers only those that occur under the existing conditions. This impact would be less than significant with mitigation for the reasons described under Impact BIO-2, and impacts under the No Project Alternative would be **less** than those that would occur under the proposed plan because less wetland features would overlap with the growth footprint compared to the proposed plan.

The Bay Area encompasses large areas of wildlands that provide habitat for both common and rare plants and wildlife, and some of these areas were mapped as Bay Area Critical Linkages. These areas are identified as lands likely important to wildlife movement between large, mostly natural areas at the statewide level in the Bay Area. As shown in **Table 4-19**, implementation of the No Project Alternative would result in a smaller area of affected Critical Linkages (30,500 acres) than the proposed plan (67,400 acres). As shown in **Table 4-20**, implementation of the No Project Alternative would also affect a lesser length of key riparian corridors (156,300 feet) than the proposed plan (348,000 feet). There would also be adverse effects on Critical Linkages due to implementation of transportation projects. This impact would be significant and unavoidable for the reasons described under Impact BIO-3, and impacts under No Project Alternative would be **less** than those that would occur under the proposed plan because a smaller area of Critical Linkages would be affected.

The potential for land use development and implementation of transportation projects under the proposed plan could result in potentially significant conflicts with local ordinances or policies protective of biological resources Habitat Conservation Plan/Natural Community Conservation Plans (HCP/NCCPs), conservation strategies, and local coastal programs (LCPs) on a localized basis as well as regionwide. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from

undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact BIO-4, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would become developed.

As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). Therefore, the No Project Alternative would have a higher potential to substantially reduce the habitat of a fish or wildlife species than the proposed plan. Overall, this impact would be significant and unavoidable for the reasons described under Impact BIO-5, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would become developed.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Impacts on special-status species could occur in areas of new residential and commercial development, sea level rise adaptation projects, and transportation projects footprints, including the temporary and permanent removal or conversion of vegetation and habitat necessary for species breeding, feeding, dispersal, or sheltering. Construction and ongoing operations could result in direct mortality of special-status plants and wildlife, entrapment in open trenches, and general disturbance due to noise or vibration during pile-driving, earthmoving, and other construction activities. Construction-generated fugitive dust accumulation on surrounding vegetation and construction-related erosion, runoff, and sedimentation could degrade the quality of adjacent vegetation communities, affecting their ability to support special-status plants and wildlife. As shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). Therefore, the No New Highway Capacity and Transit Reinvestment Alternative would have the potential to result in similar impacts to special-status species. This impact would be significant and unavoidable for the reasons described under Impact BIO-1a, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount of undeveloped land would become developed.

Impacts on critical habitat could include temporary or permanent habitat loss. Degradation of areas that have high conservation value for these species could also occur in association with development, where such development occurs in or adjacent to critical habitat through the introduction of night lighting, increases in ambient noise levels, and the introduction of invasive species and predators. Potential impacts on salmonid critical habitat could include stream degradation in association with increased impervious surfaces and surface runoff, decreases in water quality due to increased point-source pollution, and erosion and sedimentation during construction. As shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). Overall, the Alternative 1 would be the same acreage converted to development as the proposed plan in areas potentially designated as critical habitat. This impact would be less than significant with mitigation for the reasons described under Impact BIO-1b, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount of undeveloped land would become developed.

Potential impacts on wetlands include the temporary disturbance, or permanent loss, of jurisdictional waters, including wetlands; loss or degradation of stream or wetland function; incremental degradation of wetland habitats; and fragmentation of streams and wetlands. Jurisdictional waters in the region vary from relatively small, isolated roadside areas; wet meadows; and vernal pools to major streams and from rivers, bays, and estuaries to tidal, brackish, and freshwater marshes. As shown in **Table 4-17** and **Table 4-18**, the No New Highway Capacity and Transit Reinvestment Alternative would affect approximately the same acreage of wetland features (44,800 acres) as the proposed plan (44,900 acres). This impact would

be less than significant with mitigation for the reasons described under Impact BIO-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount wetland features would overlap with the growth footprint.

The Bay Area encompasses large areas of wildlands that provide habitat for both common and rare plants and wildlife, and some of these areas were mapped as Bay Area Critical Linkages. As shown in **Table 4-19**, implementation of the No New Highway Capacity and Transit Reinvestment Alternative would result in a smaller area of affected Critical Linkages (66,500 acres) than the proposed plan (67,400 acres). As shown in **Table 4-20**, implementation of the No New Highway Capacity and Transit Reinvestment Alternative would also affect a lesser length of key riparian corridors (345,200 feet) than the proposed plan (348,000 feet). There would also be adverse effects on Critical Linkages due to implementation of transportation projects. This impact would be significant and unavoidable for the reasons described under Impact BIO-3, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because a smaller area of Critical Linkages would be affected.

The potential for land use development and implementation of sea level rise adaptation and transportation projects under the proposed plan could result in potentially significant conflicts with local ordinances or policies protective of biological resources HCP/NCCPs, conservation strategies, and LCPs on a localized basis as well as regionwide. Although Alternative 1 would shift the region's transportation investments toward transit, Alternative 1 would result in the same total area of land being converted from undeveloped to developed uses as the proposed plan (8,100 acres), as shown in **Table 4-7**. This impact would be less than significant for the reasons described under Impact BIO-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount of undeveloped land would become developed.

As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). Therefore, Alternative 1 would have the same potential to substantially reduce the habitat of a fish or wildlife species as the proposed plan. Overall, this impact would be significant and unavoidable for the reasons described under Impact BIO-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount of undeveloped land would become developed.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Impacts on special-status species could occur in areas of new residential and commercial development, sea level adaptation projects, and transportation projects footprints, including the temporary and permanent removal or conversion of vegetation and habitat necessary for species breeding, feeding, dispersal, or sheltering. Construction and ongoing operations could result in direct mortality of special-status plants and wildlife, entrapment in open trenches, and general disturbance due to noise or vibration during pile-driving, earthmoving, and other construction activities. Construction-generated fugitive dust accumulation on surrounding vegetation and construction-related erosion, runoff, and sedimentation could degrade the quality of adjacent vegetation communities, affecting their ability to support special-status plants and wildlife. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a lesser area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). In terms of sea level rise adaptation projects, both the proposed plan and TOC Growth Focus Alternative contain the same list of projects and would result in the same level of environmental effects. Therefore, Alternative 2 would have the potential to result in fewer impacts on special-status species compared to the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact BIO-1a, and impacts under Alternative 2 would be **less** those that would occur under the proposed plan because a smaller area of undeveloped land would become developed.

Impacts on critical habitat could include temporary or permanent habitat loss. Degradation of areas that have high conservation value for these species could also occur in association with development, where such development occurs in or adjacent to critical habitat through the introduction of night lighting, increases in ambient noise levels, and the introduction of invasive species and predators. Potential impacts on salmonid critical habitat could include stream degradation in association with increased impervious surfaces and surface runoff, decreases in water quality due to increased point-source pollution, and erosion and sedimentation during construction. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in less land conversion from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). Overall, the TOC Growth Focus Alternative footprint would be less than the proposed plan footprint in areas potentially designated as critical habitat. This impact would be less than significant with mitigation for the reasons described under Impact BIO-1b, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would become developed.

Potential impacts on wetlands include the temporary disturbance, or permanent loss, of jurisdictional waters, including wetlands; loss or degradation of stream or wetland function; incremental degradation of wetland habitats; and fragmentation of streams and wetlands. Jurisdictional waters in the region vary from relatively small, isolated roadside areas; wet meadows; and vernal pools to major streams and from rivers, bays, and estuaries to tidal, brackish, and freshwater marshes. As shown in **Table 4-17** and **Table 4-18**, the TOC Growth Focus Alternative would affect approximately the same amount of wetland features (44,800 acres) as the proposed plan (44,900 acres). This impact would be less than significant for the reasons described under Impact BIO-2, and impacts under Alternative 2 would be **similar** those that would occur under the proposed plan because the same amount of wetland features would overlap with the growth footprint.

The Bay Area encompasses large areas of wildlands that provide habitat for both common and rare plants and wildlife, and some of these areas were mapped Bay Area Critical Linkages. As noted above, the Critical Linkages are not regulatory delineations but are identified as lands likely important to wildlife movement between large, mostly natural areas at the statewide level in the Bay Area. As shown in **Table 4-19**, implementation of the TOC Growth Focus Alternative would result in a smaller area of affected Critical Linkages (66,100 acres) than the proposed plan (67,400 acres). As shown in **Table 4-20**, implementation of the TOC Growth Focus Alternative would also affect a lesser length of key riparian corridors (339,000 feet) than the proposed plan (348,000 feet). There would also be adverse effects on Critical Linkages due to implementation of transportation projects. This impact would be significant and unavoidable for the reasons described under Impact BIO-3, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because lesser area of Critical Linkages would be affected.

The potential for land use development and implementation of transportation projects under the proposed plan could result in potentially significant conflicts with local ordinances or policies protective of biological resources HCP/NCCPs, conservation strategies, and LCPs on a localized basis as well as regionwide. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact BIO-4, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would become developed.

As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). Therefore, Alternative 2 would have less potential to substantially reduce the habitat of a fish or wildlife species than the proposed plan. Overall, this impact would be significant and unavoidable for the reasons described under Impact BIO-5, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would become developed.

4.5.6 Climate Change, Greenhouse Gases, and Energy

As identified in Section 3.6, "Climate Change, Greenhouse Gases, and Energy," several of California's waivers for mobile source emissions regulations under the CAA have been rescinded following congressional action. Although the California attorney general has filed lawsuits challenging P.L. No. 119-16 and P.L. No. 119-17, the implications of these laws on the State's capability to enforce its independent fuel economy standards are uncertain at this time because litigation is still pending.

In an effort to account for a range of potential scenarios in regard to whether the State is able to implement stricter emissions standards in the future, a range of mobile source emissions estimates were calculated for the proposed plan using older emissions models that do not assume termination of gas engine vehicle sales by 2035. These model results were used to determine project-related impacts and were calculated using both CT-EMFAC2017 (the California Department of Transportation ([Caltrans]) model based on data derived from CARB's EMFAC model and ancillary data sets (based on EMFAC2017 emissions data) and EMFAC2021. MTC anticipates that emissions modeled using an updated EMFAC2021 that accounts for rescission of California's waivers (once made available by CARB) will fall somewhere within the range of emissions modeled using EMFAC2017 and EMFAC2021. See Section 3.6, "Climate Change, Greenhouse Gases, and Energy," for further details regarding the emissions estimation methodology and information regarding the current regulatory setting. See Appendix D for details regarding the various state and federal laws, regulations, and legislative actions accounted for in EMFAC2017 and EMFAC2021.

Tables 4-21 and 4-22 present a summary of mobile source emission by metric tons of carbon dioxide equivalent ($MTCO_2e$) per day for each alternative using EMFAC2017 and EMFAC2021.

In general, calculations made using EMFAC2017 provide a more conservative estimate of emissions, as compared to EMFAC2021, because EMFAC2017 includes emissions reduction estimates based on older, less stringent mobile-source emissions regulations. However, in some instances, EMFAC2021 emissions estimates may be greater due to the model's higher estimation of emissions from passenger vehicles. The analysis below bases its discussion of impacts of the proposed plan compared to the alternatives based on the more conservative estimates of regional GHG emissions from EMFAC2021.

Table 4-23 shows the proposed plan and the alternatives' ability to meet the SB 375 goal of reducing GHG emissions per capita by 19% for passenger cars and light-duty trucks. This emissions reduction calculation relies on a version of EMFAC that deactivates clean car standards in order to isolate the benefits of the proposed plan's land use and transportation strategies. As a result, these emission reduction estimates are unaffected by Congressional actions to rescind California's waivers for mobile source emissions regulations.

The impacts related to climate change, greenhouse gases, and energy are discussed qualitatively below.

Table 4-21: Mobile Source Emissions in 2050 by Vehicle Source for Each Alternative (CO_2 tons/day) (EMFAC2021)

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Passenger Vehicles	42,900	48,100	42,700	42,800
Trucks	12,500	14,000	12,400	12,500
Buses	440	500	440	440
Other Vehicles	320	360	310	320
Regional total	56,200	62,900	55,800	56,000

Note: Numbers are rounded. Figures may not sum due to independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-22: Mobile Source Emissions in 2050 by Vehicle Source for Each Alternative (CO_2 tons/day) (EMFAC2017)

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Passenger Vehicles	37,000	41,400	36,700	36,900
Trucks	13,900	15,600	13,800	13,900
Buses	950	1,100	940	950
Other Vehicles	390	440	390	390
Regional total	52,200	58,500	51,900	52,100

Note: Numbers are rounded. Figures may not sum due to independent rounding. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as prison inmates.
Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Table 4-23: SB 375 GHG Emissions Reductions Relative to 2005 Baseline for Each Alternative[1]

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Modeled Passenger Vehicles Emissions (2035)	67,000	74,300	66,600	67,000
Emissions Per Capita (2035)	13.7	17.4	13.7	13.7
Reductions in Emissions Per Capita Relative to 2005	-21%	0.4%	-21%	-21%

Note: SB = Senate Bill; GHG = greenhouse gas.
[1] Emissions estimates related to SB 376 reduction targets were estimated using EMFAC2014 in accordance with CARB guidance (CARB 2015).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

The forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects would contribute to construction-related and operational GHG emissions. In terms of operational GHG emissions, the No Project Alternative primarily differs from the proposed plan in the number and type of transportation projects and types of mobile source–based GHG emissions reduction programs. As shown in **Table 4-21**, mobile source emissions under the No Project Alternative would be higher (62,900 $MTCO_2e$/day) compared to the proposed plan (56,200 $MTCO_2e$/day). Similar to the proposed plan, construction emissions may not be reduced to net zero in all cases. This impact would be significant and unavoidable for the reasons described in Impact GHG-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because mobile source emissions would be greater under the No Project Alternative.

The No Project Alternative would not result in a reduction in GHG emissions per capita between 2005 and 2035 as shown in **Table 4-23**. Therefore, the No Project Alternative would not meet SB 375 goals to reduce per capita passenger vehicle and light-duty truck CO_2 emissions by over 19% by 2035 compared to 2005 baseline for the reasons described in Impact GHG-2. This impact would be significant and **greater** than the impact that would occur under the proposed plan because emissions would be greater. *(Impact GHG-2 would be less than significant under the proposed plan.)*

The proposed plan meets SB 375 goals and places the Bay Area on a downward trajectory in GHG emissions, but CARB has identified that meeting SB 375 goals alone will not meet statewide goals under the 2022 Scoping Plan. Neither the proposed plan nor the No Project Alternative have additional land use strategies to feasibly bridge the gap between the proposed plan GHG emissions and 2030 (and beyond) targets. This gap would remain larger under the No Project Alternative than under the proposed plan (**Table 4-23**). Because GHG emissions from mobile sources would be greater under the No Project Alternative, this impact would be significant and unavoidable for the reasons described in Impact GHG-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan.

Local climate action plans and GHG emissions reduction plans are adopted by local jurisdictions to comply with the goals set for local governments in CARB's Scoping Plan. CARB's Scoping Plan includes implementation of SB 375. Because the No Project Alternative would not comply with SB 375, as it would not implement an RTP/SCS, this impact would be significant and **greater** than the impact that would occur under the proposed plan, which would be less than significant (GHG-4).

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects under the No Project Alternative would not result in the wasteful, unnecessary, or inefficient use of energy because the energy associated with these projects would be serving necessary regional needs and would comply with applicable regulations and standards (e.g., Renewable Portfolio Standard, California Energy Code). Because individual projects would comply with applicable regulations and standards, this impact would be less than significant for the reasons described in Impact EN-1, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Consideration of per capita energy consumption associated with the proposed plan and alternatives is related to electricity and natural gas use and per capita VMT, which is directly related to use of petroleum-based fuels. VMT per capita would be greater under the No Project Alternative (21.0) than under the proposed plan (18.6) (**Table 4-31**). This impact would be less than significant for the reasons discussed under Impact EN-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because more fuel would be needed to support a higher VMT per capita.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Construction- and operations-related GHG emissions associated with the forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects would contribute to GHG emissions. In terms of operations-related GHG emissions, Alternative 1 primarily differs from the proposed plan due to the number and type of transportation projects and types of mobile source–based GHG emission reduction programs. As shown in **Table 4-21**, mobile source emissions under Alternative 1 would be reduced (55,800 $MTCO_2e$/day) compared to the proposed plan (56,200 $MTCO_2e$/day). Similar to the proposed plan, construction emissions may not be reduced to net zero in all cases. This impact would be significant and unavoidable for the reasons described in Impact GHG-1, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because mobile source emissions would be lower under Alternative 1.

Alternative 1 would result in a 21% reduction in GHG emissions, similar to the proposed plan, between 2005 and 2035, thereby meeting SB 375 goals to reduce per capita passenger vehicle and light-duty truck CO_2 emissions by over 19% by 2035 compared to 2005 baseline (**Table 4-23**). This impact would be less than significant for the reasons described under Impact GHG-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because per capita emissions from passenger vehicles and light trucks would be similar.

The proposed plan meets SB 375 goals and places the Bay Area on a downward trajectory in GHG emissions, but CARB has identified that meeting SB 375 goals alone will not meet statewide goals under the Scoping Plan. Compared to the proposed plan, Alternative 1 includes the same levels of household and job growth in the Growth Geographies. As shown in **Table 4-23**, Alternative 1 would reduce GHG emissions per capita by 21% relative to the 2005 baseline, which is the same level of reduction as the proposed plan. As with the proposed plan, this would not provide enough of a reduction in GHG emissions to meet statewide goals under the Scoping Plan. This impact would be significant and unavoidable for the reasons described in Impact GHG-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because emissions would be similar.

Local climate action plans and GHG reduction plans are adopted by local jurisdictions to comply with the goals set for local governments in CARB's Scoping Plan. The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of Alternative 1 would not conflict with local climate action or GHG reduction plans. This impact would be less than significant for the reasons described in Impact GHG-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because individual projects would not conflict with local climate action or GHG emissions reduction plans.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects under Alternative 1 would not result in the wasteful, unnecessary, or inefficient use of energy because the energy associated with these projects would be serving necessary regional needs and would comply with applicable regulations and standards (e.g., Renewable Portfolio Standard, California Energy Code). This impact would be less than significant for the reasons described in Impact EN-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because individual projects would comply with applicable regulations and standards.

Consideration of per capita energy consumption associated with the proposed plan and alternatives is related to electricity and natural gas use and per capita VMT, which is directly related to use of petroleum-based fuels. VMT per capita would be the similar under Alternative 1 (18.5) as the proposed plan (18.6) (**Table 4-31**). This impact would be less than significant for the reasons discussed under EN-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because VMT per capita would be similar.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Construction-related GHG emissions associated with the forecasted land use growth footprint, sea level rise adaptation projects, and transportation projects would contribute to GHG emissions. In terms of operational GHG emissions, Alternative 2 primarily differs from the proposed plan due to the number and type of transportation projects and types of mobile source–based GHG emission reduction programs. As shown in **Table 4-21**, mobile source emissions under the TOC Growth Focus Alternative (56,000 $MTCO_2e$/day) would be similar to the proposed plan (56,200 $MTCO_2e$/day). Similar to the proposed plan, construction emissions may not be reduced to net zero in all cases. This impact would be significant and unavoidable for the reasons described in Impact GHG-1, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because emissions would be similar.

The TOC Growth Focus Alternative would result in a 21% reduction in GHG emissions, similar to the proposed plan, thereby meeting SB 375 goals to reduce per capita passenger vehicle and light-duty truck CO_2 emissions by over 19% by 2035 compared to 2005 baseline (**Table 4-23**). This impact would be less than significant for the reasons described in Impact GHG-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because per capita emissions from passenger vehicles and light trucks would be the same as under the TOC Growth Focus Alternative (21% reduction).

Although the proposed plan meets SB 375 goals and places the Bay Area on a downward trajectory in GHG emissions, CARB has identified that meeting SB 375 goals alone will not meet statewide goals under the Scoping Plan. Compared to the proposed plan, the Policy Area Growth Focus Alternative includes the same levels of household and job growth in the Growth Geographies. As shown in **Table 4-23**, the Policy Area Growth Focus Alternative would reduce GHG emissions per capita by 21% relative to the 2005 baseline, which represents the same reduction as the proposed plan. However, this would not provide enough of a reduction in GHG emissions to meet statewide goals under the Scoping Plan. This impact would be significant and unavoidable for the reasons described in Impact GHG-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because emissions would be the same.

Local climate action plans and GHG reduction plans are adopted by local jurisdictions to comply with the goals set for local governments in CARB's Scoping Plan. The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the Policy Area Growth Focus Alternative would not conflict with local climate action or GHG reduction plans. This impact would be less than significant for the reasons described in Impact GHG-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because individual projects would not conflict with local climate action or GHG reduction plans.

Development of new residential and commercial land uses, sea level rise adaptation, and transportation projects under the Policy Area Growth Focus Alternative would not result in the wasteful, unnecessary, or inefficient use of energy because the energy associated with these projects would be serving necessary regional needs and would comply with applicable regulations and standards (e.g., Renewable Portfolio Standard, California Energy Code). This impact would be less than significant for the reasons described in Impact EN-1, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because individual projects would comply with applicable regulations and standards.

Consideration of per capita energy consumption associated with the proposed plan and alternatives is related to electricity and natural gas use and per capita VMT, which is directly related to use of petroleum-based fuels. VMT per capita would be similar under the Policy Area Growth Focus Alternative (18.5) and the proposed plan (18.6) (**Table 4-31**). This impact would be less than significant for the reasons discussed under Impact EN-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because VMT per capita would be the same.

4.5.7 Cultural Resources and Tribal Cultural Resources

NO PROJECT ALTERNATIVE

Projects located in areas with known historical sites, located in communities with established historic preservation programs, or involving activities that would introduce new visual elements or disturb the existing terrain have the potential to result in substantial historic resource impacts. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed; thus, there would be a potential to encounter more historical sites.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in archaeological impacts if construction activities include the disturbance of previously identified or unidentified archaeological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood to encounter significant archaeological resources, which could represent important examples of periods of California's prehistory. Likewise, the establishment of staging areas, temporary roads, and other temporary facilities necessary for construction activities has the potential to impact these cultural resources. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-2, and impacts under the No Project Alternative would be **greater** than the impact that would occur under the proposed plan because a greater area of undeveloped land would be developed.

In general, potential impacts on human remains would be similar to those discussed for archaeological resource impacts discussed above. Development of new residential and commercial land uses, sea level

rise adaptation projects, and transportation projects involving construction activities that would disturb native terrain, including excavation, grading, or soil removal, would have the greatest likelihood of encountering human remains. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains and to appropriately treat any remains that are discovered. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact CUL-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

No tribes requested contact or consultation for the proposed plan, besides Graton Rancheria, which did not respond to follow-up outreach for consultation. Therefore, consultation has not resulted in identification of tribal cultural resources (TCRs) that would be affected by the plan. However, it is possible that TCRs could still be identified, including during analysis of subsequent projects. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres) and therefore has a greater potential to disturb TCRs. This impact would be significant and unavoidable for the reasons described under Impact CUL-5, and impacts under the No Project Alternative would be **greater** than the impact that would occur under the proposed plan because a greater area of undeveloped land would be developed.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Projects located in areas with known historical sites, located in communities with established historic preservation programs, or involving activities that would introduce new visual elements or disturb the existing terrain have the potential to result in substantial historic resource impacts. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same amount of undeveloped land would be developed.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in archaeological impacts if construction activities include the disturbance of previously identified or unidentified archaeological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood of encountering significant archaeological resources, which could represent important examples of periods of California's prehistory. Likewise, the establishment of staging areas, temporary roads, and other temporary facilities necessary for construction activities has the potential to impact these cultural resources. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

In general, potential impacts on human remains would be similar to those discussed for archaeological resource impacts discussed above. Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects involving construction activities that would disturb native terrain, including excavation, grading, or soil removal, would have the greatest likelihood to encounter human remains. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains and to appropriately treat any remains that are discovered. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses as the proposed plan (8,100 acres). This impact would be less than significant for the reasons described under

Impact CUL-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

No tribes requested contact or consultation for the proposed plan, besides Graton Rancheria, which did not respond to follow-up outreach for consultation. Therefore, consultation has not resulted in identification of TCRs that would be affected by the plan. However, it is possible that TCRs could still be identified, including during analysis of subsequent projects. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Projects located in areas with known historical sites, located in communities with established historic preservation programs, or involving activities that would introduce new visual elements or disturb the existing terrain have the potential to result in substantial historic resource impacts. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-1, impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in archaeological impacts if construction activities include the disturbance of previously identified or unidentified archaeological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood to encounter significant archaeological resources, which could represent important examples of periods of California's prehistory. Likewise, the establishment of staging areas, temporary roads, and other temporary facilities necessary for construction activities has the potential to impact these cultural resources. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

In general, potential impacts on human remains would be similar to those discussed for archaeological resource impacts discussed above. Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects involving construction activities that would disturb native terrain, including excavation, grading, or soil removal would have the greatest likelihood to encounter human remains. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains, and to appropriately treat any remains that are discovered. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact CUL-3, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

No tribes requested contact or consultation for the proposed plan, besides Graton Rancheria, which did not respond to follow-up outreach for consultation. Therefore, consultation has not resulted in identification of TCRs that would be affected by the plan. However, it is possible that TCRs could still be identified, including

during analysis of subsequent projects. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be significant and unavoidable for the reasons described under Impact CUL-5, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

4.5.8 Geology, Seismicity, and Mineral Resources

Tables 4-24 through 4-27 provide quantifiable data related to geology, seismicity, and mineral resource impacts.

Table 4-24: Alquist-Priolo Zone Acreage by Alternative

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total Footprint
Proposed Plan	570	820	170	1,600
No Project Alternative	1,100	50	20	1,200
Alternative 1	570	820	160	1,600
Alternative 2	450	820	170	1,400

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100). Figures may not sum due to independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-25: Ground Shaking Potential Acreage by Alternative

	Alternative	Very Strong: MMI 7	Severe: MMI 8	Violent: MMI 9
Land Use Growth Footprint	Proposed Plan	680	24,200	9,900
	No Project Alternative	1,600	41,700	13,000
	Alternative 1	680	24,200	9,900
	Alternative 2	690	21,600	8,200
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	10	43,000	36,900
	No Project Alternative	0	6,600	2,100
	Alternative 1	10	43,000	36,900
	Alternative 2	10	43,000	36,900
Transportation Projects Footprint	Proposed Plan	90	5,200	3,200
	No Project Alternative	0	770	200
	Alternative 1	50	4,000	2,800
	Alternative 2	90	5,200	3,200

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-26: Liquefaction Potential Acreage by Alternative

	Alternative	Very Low Potential	Low Potential	Medium Potential	High Potential	Very High Potential
Land Use Growth Footprint	Proposed Plan	7,200	4,900	15,200	1,400	5,900
	No Project Alternative	24,500	5,600	18,900	3,200	3,700
	Alternative 1	7,200	4,900	15,200	1,400	5,900
	Alternative 2	6,700	4,200	12,700	1,300	5,400

	Alternative	Very Low Potential	Low Potential	Medium Potential	High Potential	Very High Potential
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	5,100	980	55,000	1,700	9,400
	No Project Alternative	390	2	6,800	390	1,000
	Alternative 1	5,100	980	55,000	1,700	9,400
	Alternative 2	5,100	980	55,000	1,700	9,400
Transportation Projects Footprint	Proposed Plan	1,500	720	4,800	490	970
	No Project Alternative	140	60	670	20	70
	Alternative 1	1,200	540	3,600	430	930
	Alternative 2	1,500	720	4,800	490	970

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-27: Landslide Zones Potential Acreage by Alternative

	Alternative	Few	Mostly
Land Use Growth Footprint	Proposed Plan	4,300	810
	No Project Alternative	16,600	4,900
	Alternative 1	4,300	810
	Alternative 2	3,900	600
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	3,100	860
	No Project Alternative	40	0
	Alternative 1	3,100	860
	Alternative 2	3,100	860
Transportation Projects Footprint	Proposed Plan	1,200	110
	No Project Alternative	120	30
	Alternative 1	1,000	110
	Alternative 2	1,200	110

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

No Project Alternative

Surface fault rupture could occur along any of the active fault traces or within the associated Alquist-Priolo Zone for the active faults in the plan area. Although fault rupture is not entirely confined to the boundaries of an Alquist-Priolo Zone, the likelihood of rupture occurring outside these zones is very low based on historical evidence and geologic records. The land use growth footprint under the No Project Alternative overlaps with a larger portion of Alquist-Priolo Zones (1,100 acres) compared to the proposed plan (570 acres) (see **Table 4-24**). The sea level rise adaptation projects and transportation projects footprint under the No Project Alternative overlap with smaller portions of Alquist-Priolo Zones (50 and 20 acres, respectively) compared to the proposed plan (820 and 170 acres) (see **Table 4-24**). Overall, the No Project Alternative overlaps approximately 1,200 acres of Alquist-Priolo Zones compared to 1,600 acres under the proposed plan. Regulatory agencies with oversight of development associated with the proposed plan have developed regulations and engineering design specifications that address and substantially reduce hazards associated with site-level geological and seismic conditions. This impact would be less than significant for the reasons described under Impact GEO-1, and impacts under the No

Project Alternative would be **less** than those that would occur under the proposed plan because the land use growth footprint would overlap with a lesser area of Alquist-Priolo Zones under the No Project Alternative.

According to modeling conducted by the US Geological Survey (USGS) in conjunction with the California Geologic Survey (CGS), the Bay Area is predicted to experience at least one major earthquake (greater than moment magnitude 6.7) within the next 20 years. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the magnitude, the duration of shaking, and the characteristics of the underlying geologic materials. The entire Bay Area is classified as having the potential to experience strong to violent ground shaking (MMI 7–9). **Table 4-25** quantifies the area within the land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint based on this data. As shown, the No Project Alternative would have a greater area of land use growth footprint but a lesser area of sea level rise adaptation projects and transportation projects footprints located in areas subject to strong, very strong, or violent ground shaking compared to the proposed plan. However, existing regulatory requirements specify mandatory actions that must occur during project development. This impact would be less than significant for the reasons described under Impact GEO-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because the land use growth footprint would occur within a greater area of potential ground shaking under the No Project Alternative.

Liquefaction typically occurs in areas underlain with loose, saturated, cohesionless soils within the upper 50 feet of subsurface materials. These soils, when subjected to ground shaking, can lose their strength due to buildup of excess pore water pressure, causing them to function in a manner closer to a liquefied state. **Table 4-26** provides an acreage summary of the area of land use growth, sea level rise adaptation projects, and transportation projects footprints that would be subject to potential liquefaction. The No Project Alternative would have a smaller area of land use growth, sea level rise adaptation projects, and transportation projects footprints in areas classified as very high liquefaction zones and a greater area in a high liquefaction potential zone for the land use growth footprint. However, subsequent development would be required to conform to the current seismic design provisions of the California Building Code (CBC) to reduce potential losses from ground failure as a result of an earthquake. These future projects would also be required to adhere to the local general plans and local building code requirements that contain seismic safety policies to resist ground failure through modern construction techniques. This impact would be less than significant for the reasons described under Impact GEO-3, and impacts under the No Project Alternative would be **less** than those that would occur under the proposed plan because a smaller area would be in a very high liquefaction potential zone.

The plan area includes a wide range of topographical conditions, and landslide hazards vary from very low in low-lying areas to very high in some upland areas, especially areas with slopes that exceed 15%. **Table 4-27** shows acreage of land use growth, sea level rise adaptation projects, and transportation projects footprints where there is potential for landslides. As shown, the No Project Alternative would have a greater risk of landslides than the proposed plan for the land use growth footprint and a smaller risk of landslides for the sea level rise adaptation projects and transportation projects footprint. This impact would be less than significant for the reasons described under Impact GEO-4, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because an overall greater area would be within higher risk landslide zones.

Buildout of the land use growth footprint and construction of sea level rise adaptation projects and transportation projects would include earthwork activities that could expose soils to the effects of erosion or loss of topsoil. Once disturbed, either through removal of vegetation, asphalt, or demolition of a structure, stockpiled soils may be exposed to the effects of wind and water. However, construction activities are required to adhere to National Pollutant Discharge Elimination System permit requirements

for construction, as well as any local grading ordinance requirements that may include erosion prevention measures. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-5, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

The projected changes in land use and the projected sea level rise adaptation projects and transportation projects would be located on a range of different geologic materials and conditions. Hazards associated with unstable soils or geologic units are dependent on site-specific conditions, as well as the specific nature of the individual project proposed. With adherence to grading permit and building code requirements, including seismic design criteria as required by the CBC, Caltrans, Special Publication 117A, and local building code requirements, the improvements and development associated with the proposed plan would be designed to minimize potential risks related to unstable soils and geologic units. Existing regulatory requirements specify mandatory and relatively prescriptive actions that must occur during project development and would effectively reduce the inherent hazard. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-6, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in discovery and disturbance of paleontological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood to encounter these resources. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres), which could result in land conversion in greater areas of paleontological sensitivity. This impact would be significant and unavoidable for the reasons described under Impact GEO-7, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Local jurisdictions have general plan policies to manage mineral resources and are required under the Surface Mining and Reclamation Act (SMARA) to consider significant mineral deposits identified by CGS. Local general plans, specific plans, and other land use plans include policies to protect existing and planned future mineral production and extraction activities from surrounding uses and require that future projects near mining activities have compatible land uses. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact MR-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Alternative 1: No New Highway Capacity and Transit Reinvestment Alternative

Surface fault rupture could occur along any of the active fault traces or within the associated Alquist-Priolo Zone for the active faults in the plan area. Although fault rupture is not entirely confined to the boundaries of an Alquist-Priolo Zone, the likelihood of rupture occurring outside of these zones is very low based on historical evidence and geologic records. The land use growth footprint, sea level rise projects footprint, and transportation projects footprint under Alternative 1 would overlap with the same land area within Alquist-Priolo Zones (1,600 acres) compared to the proposed plan (see **Table 4-24**). Regulatory agencies with oversight of development associated with the proposed plan have developed regulations

and engineering design specifications that address and substantially reduce hazards associated with site-level geological and seismic conditions. This impact would be less than significant for the reasons described under Impact GEO-1, and impacts under Alternative 1 would be **similar** to the impact that would occur under the proposed plan because the development would occur in the same acreage of land within Alquist-Priolo Zones.

According to modeling conducted by USGS in conjunction with CGS, the Bay Area is predicted to experience at least one major earthquake (greater than moment magnitude 6.7) within the next 20 years. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the magnitude, the duration of shaking, and the characteristics of the underlying geologic materials. The entire Bay Area is classified as having the potential to experience strong to violent ground shaking (MMI 7–9). **Table 4-25** quantifies the area in the land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint based on this data. As shown, Alternative 1 would have the same acreage of land in the land use growth footprint and sea level rise adaptation projects footprint located in areas subject to strong, very strong, or violent ground shaking compared to the proposed plan. Alternative 1 would have less acreage of land in the transportation projects footprint located in areas subject to strong, very strong, or violent ground shaking compared to the proposed plan (**Table 4-25**). Existing regulatory requirements specify mandatory actions that must occur during project development. This impact would be less than significant for the reasons described under Impact GEO-2, impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because the transportation projects footprint would occur within a smaller area of potential ground shaking.

Liquefaction typically occurs in areas underlain with loose, saturated, cohesionless soils within the upper 50 feet of subsurface materials. These soils, when subjected to ground shaking, can lose their strength due to buildup of excess pore water pressure, causing them to function in a manner closer to a liquefied state. **Table 4-26** provides an acreage summary of land use growth, sea level rise adaptation projects, and transportation projects footprints that would be subject to potential liquefaction. Alternative 1 would have the same acreage of land in the land use growth footprint and the sea level rise projects footprint in areas classified as high (1,400 acres and 1,700 acres, respectively) or very high (5,900 acres and 9,400 acres, respectively) liquefaction hazard as with the proposed plan. Alternative 1 would have slightly reduced area of land in the of transportation projects footprint in areas classified as high or very high liquefaction hazard compared to the proposed plan (430 acres versus 490 acres in high potential area; 930 acres versus 970 acres in very high potential area). Subsequent development would be required to conform to the current seismic design provisions of the CBC to reduce potential losses from ground failure as a result of an earthquake. These future projects would also be required to adhere to the local general plans and local building code requirements that contain seismic safety policies to resist ground failure through modern construction techniques. This impact would be less than significant for the reasons described under Impact GEO-3, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because a smaller area of the transportation projects footprint would be within a high or very high liquefaction potential zone.

The plan area includes a wide range of topographical conditions, and landslide hazards vary from very low in low-lying areas to very high in some upland areas, especially areas with slopes that exceed 15%. **Table 4-27** shows acreage of land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint where there is potential for landslides. Alternative 1 would have the same acreage of land in the land use growth footprint (810 acres), the sea level rise adaptation projects footprint (860 acres), and the transportation projects footprint (110 acres) located in areas categorized as mostly landslides as the proposed plan. This impact would be less than significant for the reasons described under Impact GEO-4, and impacts under Alternative 1 would be **similar** as those that would occur under the proposed plan because the development would occur in the same acreage of land within higher risk landslide zones.

Buildout of the land use growth footprint and construction of sea level rise adaptation projects and transportation projects would include earthwork activities that could expose soils to the effects of erosion or loss of topsoil. Once disturbed, either through removal of vegetation, asphalt, or demolition of a structure, stockpiled soils may be exposed to the effects of wind and water. However, construction activities are required to adhere to National Pollutant Discharge Elimination System permit requirements for construction, as well as any local grading ordinance requirements that may include erosion prevention measures. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

The projected changes in land use and sea level rise adaptation projects and transportation projects would be located on a range of different geologic materials and conditions. Hazards associated with unstable soils or geologic units are dependent on site-specific conditions, as well as the specific nature of the individual project proposed. With adherence to grading permit and building code requirements, including seismic design criteria as required by the CBC, Caltrans, Special Publication 117A, and local building code requirements, the improvements and development associated with Alternative 1 would be designed to minimize potential risks related to unstable soils and geologic units. Existing regulatory requirements specify mandatory and relatively prescriptive actions that must occur during project development and would effectively reduce the inherent hazard. As shown in **Table 4-7**, the Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses (8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-6, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in discovery and disturbance of paleontological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood to encounter these resources. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses (8,100 acres), which would have the potential to result in the same amount of land conversion in areas of paleontological sensitivity. This impact would be significant and unavoidable for the reasons described under Impact GEO-7, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Local jurisdictions have general plan policies to manage mineral resources and are required under SMARA to consider significant mineral deposits identified by CGS. Local general plans, specific plans, and other land use plans include policies to protect existing and planned future mineral production and extraction activities from surrounding uses and require that future projects near mining activities have compatible land uses. As shown in **Table 4-7**, Alternative 1 would result in the same amount of land being converted from undeveloped to developed uses as the proposed plan (8,100 acres). This impact would be less than significant for the reasons described under Impact MR-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Alternative 2: TOC Growth Focus Alternative

Surface fault rupture could occur along any of the active fault traces or within the associated Alquist-Priolo Zone for the active faults in the plan area. Although fault rupture is not entirely confined to the boundaries of an Alquist-Priolo Zone, the likelihood of rupture occurring outside these zones is very low based on historical evidence and geologic records. The land use growth footprint under the TOC Growth

Focus Alternative overlaps with a smaller portion of Alquist-Priolo Zones (450 acres) than the proposed plan (570 acres) (see **Table 4-24**). Alternative 2 would result in the same amount of land in the sea level rise adaptation projects footprint (820 acres) and transportation projects footprint (170 acres) that overlaps with Alquist-Priolo Zones as the proposed plan. Overall, the TOC Growth Focus Alternative would have a smaller area associated with Alquist-Priolo Zones compared to the proposed plan. Regulatory agencies with oversight of development associated with the proposed plan have developed regulations and engineering design specifications that address and substantially reduce hazards associated with site-level geological and seismic conditions. This impact would be less than significant for the reasons described under Impact GEO-1, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because the land use growth footprint would occur within a smaller area of Alquist-Priolo Zones.

According to modeling conducted by USGS in conjunction with CGS, the Bay Area is predicted to experience at least one major earthquake (greater than moment magnitude 6.7) within the next 20 years. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the magnitude, the duration of shaking, and the characteristics of the underlying geologic materials. The entire Bay Area is classified as having the potential to experience strong to violent ground shaking (MMI 7–9). **Table 4-25** quantifies the area in the land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint based on this data. The TOC Growth Focus Alternative would have a similar or smaller area of footprint located in areas subject to strong, very strong, or violent ground shaking compared to the proposed plan. However, existing regulatory requirements specify mandatory actions that must occur during project development. This impact would be less than significant for the reasons described under Impact GEO-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because there would be an overall smaller area subject to potential ground shaking as compared to the plan.

Liquefaction typically occurs in areas underlain with loose, saturated, cohesionless soils within the upper 50 feet of subsurface materials. These soils, when subjected to ground shaking, can lose their strength due to buildup of excess pore water pressure, causing them to function in a manner closer to a liquefied state. **Table 4-26** provides a summary of the acreage of the land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint that would be subject to potential liquefaction. The TOC Growth Focus Alternative would have a smaller acreage of land in the land use growth footprint and same acreage of land in the sea level rise adaptation projects and transportation project footprints located in areas classified as high or very high liquefaction hazard compared to the proposed plan. However, subsequent development would be required to conform to the current seismic design provisions of the CBC to reduce potential losses from ground failure as a result of an earthquake. These future projects would also be required to adhere to the local general plans and local building code requirements that contain seismic safety policies to resist ground failure through modern construction techniques. This impact would be less than significant for the reasons described under Impact GEO-3, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of the transportation projects footprint would be in a high liquefaction potential zone.

The plan area includes a wide range of topographical conditions, and landslide hazards vary from very low in low-lying areas to very high in some upland areas, especially areas with slopes that exceed 15%. **Table 4-27** shows acreage of land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint where there is potential for landslides. The TOC Growth Focus Alternative would have a lower risk for landslides than the proposed plan for the land use growth footprint. The risk of landslides associated with sea level rise adaptation projects footprint and transportation projects footprint are the same under Alternative 2 and the proposed plan. This impact would be less than significant for the reasons described under Impact GEO-4, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because an overall smaller area would be in higher risk landslide zones.

Buildout of the land use growth footprint and construction of sea level rise adaptation projects and transportation projects would include earthwork activities that could expose soils to the effects of erosion or loss of topsoil. Once disturbed, either through removal of vegetation, asphalt, or demolition of a structure, stockpiled soils may be exposed to the effects of wind and water. However, construction activities are required to adhere to National Pollutant Discharge Elimination System permit requirements for construction, as well as any local grading ordinance requirements that may include erosion prevention measures. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-5, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

The projected changes in land use and sea level rise adaptation projects and transportation projects would be located on a range of different geologic materials and conditions. Hazards associated with unstable soils or geologic units are dependent on site-specific conditions, as well as the specific nature of the individual project proposed. With adherence to grading permit and building code requirements, including seismic design criteria as required by the CBC, Caltrans, Special Publication 117A, and local building code requirements, improvements and development associated with the TOC Growth Focus Alternative would be designed to minimize potential risks related to unstable soils and geologic units. Existing regulatory requirements specify mandatory and relatively prescriptive actions that must occur during project development and would effectively reduce the inherent hazard. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact GEO-6, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Development of new residential and commercial land uses, sea level rise adaptation projects, and transportation projects could result in discovery and disturbance of paleontological resources. Projects involving excavation, grading, or soil removal in previously undisturbed areas have the greatest likelihood of encountering these resources. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres), which could result in land conversion in a smaller area of paleontological sensitivity compared to the proposed plan. This impact would be significant and unavoidable for the reasons described under Impact GEO-7, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Local jurisdictions have general plan policies to manage mineral resources and are required under SMARA to consider significant mineral deposits identified by CGS. Local general plans, specific plans, and other land use plans include policies to protect existing and planned future mineral production and extraction activities from surrounding uses and require that future projects near mining activities have compatible land uses. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact MR-1, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

4.5.9 Hazards and Wildfire

Table 4-28 shows a summary of acreage of ultramafic rock (which produces asbestos) in the land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint. **Table 4-29** shows a summary of the acreage of proposed plan and alternatives in fire hazard severity zones.

Table 4-28: Ultramafic Rock Acreage by Alternative

Alternative	Land Use Growth Footprint	Sea Level Rise Adaptation Projects Footprint	Transportation Projects Footprint	Total
Proposed Plan	630	60	30	720
No Project Alternative	940	0	0	940
Alternative 1	630	60	10	700
Alternative 2	560	60	30	650

Notes: Whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10). Figures may not sum due to independent rounding.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-29: Fire Hazard Zones Acreage by Alternative

	Alternative	Moderate	High	Very High	Total
Land Use Growth Footprint	Proposed Plan	150	70	330	550
	No Project Alternative	2,100	6,000	2,100	10,200
	Alternative 1	150	70	330	550
	Alternative 2	150	70	230	450
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	2,700	1,200	180	4,000
	No Project Alternative	<1	0	<1	1
	Alternative 1	2,700	1,200	180	4,000
	Alternative 2	2,700	1,200	180	4,000
Transportation Projects Footprint	Proposed Plan	180	450	0	630
	No Project Alternative	70	130	0	200
	Alternative 1	130	400	0	530
	Alternative 2	180	450	0	630

Notes: Numbers less than 1 are shown as "<1"; whole numbers have been rounded (between 0 and 10 to the nearest whole number, between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

The projected land use growth footprint, sea level rise adaptation projects, and transportation projects could increase the routine transport, use, storage, and disposal of hazardous wastes in the region. These impacts are subject to regulations described in Section 3.9, "Hazards and Wildfire," which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-1, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Construction associated with implementation of the No Project Alternative could result in impacts related to use of hazardous materials and disturbance of potentially hazardous materials, including naturally occurring asbestos (NOA). The most likely incidents involving construction-related hazardous materials

are generally associated with minor spills or drips. Small fuel or oil spills are possible but would have a negligible impact on public health. All hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations, and spills would be cleaned up in accordance with applicable regulations. As shown in **Table 4-28**, there would be a larger area of the land located in areas that may result in dispersal of NOA (i.e., ultramafic rock) under the No Project Alternative (940 acres) compared to the proposed plan (720 acres). This impact would be less than significant for the reasons described under Impact HAZ-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan due to the increased risk for NOA dispersal.

During construction, demolition, and excavation activities, the changes in planned land use and transportation projects could potentially produce hazardous air emissions or involve the handling of extremely hazardous wastes. During operation, land use projects could use and produce hazardous materials that may be transported on roadways included in the plan area. However, all projects would comply with federal and State regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level and, in particular, to protect schools. Existing protective measures and regulations would be sufficient to ensure that hazardous materials stored, used, transported, and disposed of under the plan would not pose a substantial hazard to the public or the environment, including children at schools, under normal conditions. These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-3, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Throughout the plan area, there are many sites where historical releases of hazardous materials or wastes have occurred; these are listed in environmental databases in accordance with Government Code Section 65962.5. These sites range from small releases that have had localized effects on private property and have already been remediated to large-scale releases from long-term historical industrial practices that have had wider ranging effects on groundwater. These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be significant and unavoidable for the reasons described under Impact HAZ-4, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Projects within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport would not be approved by local agencies until project design plans have been reviewed and approved by the appropriate airport land use commission (ALUC). These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-5, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because regulations pertaining to airports would be implemented.

The forecasted increase of population and employment anticipated in the plan area could increase congestion on evacuation routes and slow evacuation. This could impair implementation of emergency response or evacuation plans, particularly if local plans rely on evacuation via personal vehicle. Although changes in land use would be reflected in updated emergency and evacuation plans, it is not known whether the changes would be sufficient to ensure adequate evacuation. Under the No Project Alternative, development patterns would be more spread out and would thus reduce the potential degree of congestion on local roadways during evacuation procedures. Because evacuation during emergency conditions would be less impeded by vehicular congestion under the No Project Alternative, this impact would be significant and unavoidable for the reasons described under Impact HAZ-6, and impacts under the No Project Alternative would be **less** than those that would occur under the proposed plan.

Land development under the proposed plan could result in exposure of people to loss, injury, or death and damage to property adjacent to wildlands or where residences are intermixed with wildlands. The No Project Alternative would result in a smaller portion of the sea level rise adaptation projects footprint and transportation projects footprint located in fire hazard severity zones compared to the proposed plan (**Table 4-29**). Although the overall sea level rise adaptation projects footprint would be smaller under the No Project Alternative, sea level rise adaptation projects include wetland restoration and new green spaces with water that could serve as fire breaks. However, the No Project Alternative would result in a substantially greater land use growth footprint in a fire hazard severity zone rated moderate, high, or very high (10,200 acres) than the proposed plan (550 acres) (**Table 4-29**). Because of this greater area of the land use growth footprint in higher risk fire zones, this impact would be significant and unavoidable for the reasons described under Impact HAZ-7, and impacts under the No Project Alternative would be **greater** than those would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The projected land use growth footprint, sea level rise adaptation projects, and transportation projects could increase the routine transport, use, storage, and disposal of hazardous wastes in the region. These impacts are subject to regulations described in Section 3.9, "Hazards and Wildfire," which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Construction associated with implementation of Alternative 1 could result in impacts related to use of hazardous materials and disturbance of potentially hazardous materials. The most likely incidents involving construction-related hazardous materials are generally associated with minor spills or drips. Small fuel or oil spills are possible but would have a negligible impact on public health. All hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations, and spills would be cleaned up in accordance with applicable regulations. As shown in **Table 4-29**, there would be a smaller area of the land located in areas that may result in dispersal of NOA (i.e., ultramafic rock) under Alternative 1 (700 acres) compared to the proposed plan (720 acres). Because the potential to disperse NOA would occur in less area, this impact would be less than significant for the reasons described under Impact HAZ-2, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan.

During construction, demolition, and excavation activities, construction under Alternative 1 could potentially produce hazardous air emissions or involve the handling of extremely hazardous wastes. During operation, land use projects could use and produce hazardous materials that may be transported on roadways included in the plan. However, all projects would comply with federal and State regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level and, in particular, to protect schools. Implementation of individual projects would require compliance with regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Throughout the plan area, there are many sites where historical releases of hazardous materials or wastes have occurred; these are listed in environmental databases in accordance with Government Code Section 65962.5. These sites range from small releases that have had localized effects on private property and have already been remediated to large-scale releases from long-term historical industrial practices that have had wider ranging effects on groundwater. These impacts are subject to regulations described in Section 3.9,

which would reduce the potential for adverse effects to occur. This impact would be significant and unavoidable for the reasons described under Impact HAZ-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Projects in an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport would not be approved by local agencies until project design plans have been reviewed and approved by the appropriate ALUC. These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because regulations pertaining to airports would be implemented.

The forecasted increase in population and employment anticipated in the plan area could increase congestion on evacuation routes and slow evacuation. Reduced highway capacity projects under Alternative 1 would increase congestion during evacuation. This could impair implementation of emergency response or evacuation plans, particularly if local plans rely on evacuation via personal vehicle. Although changes in land use would be reflected in updated emergency and evacuation plans, it is not known whether the changes would be sufficient to ensure adequate evacuation. Under Alternative 1, development patterns would be similar to the proposed plan, creating issues of potential congestion on local roadways during evacuation procedures that would be similar to the proposed plan. Because evacuation during emergency conditions would be similarly impeded by vehicular congestion under Alternative 1, this impact would be significant and unavoidable for the reasons described under Impact HAZ-6, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Land development under Alternative 1 could result in exposure of people to loss, injury, or death and damage to property adjacent to wildlands or where residences are intermixed with wildlands. Alternative 1 would result in the same amount of land in the land use growth footprint (550 acres) and the sea level rise adaptation projects footprint (4,000 acres) in a fire hazard severity zone rated moderate, high, or very high as with the proposed plan (**Table 4-29**). However, Alternative 1 would result in a smaller area of the transportation projects footprint (530 acres) in a fire hazard severity zone rated moderate, high, or very high compared to the proposed plan (630 acres). Although there would be a smaller transportation projects footprint under Alternative 1, transportation projects could provide additional emergency evacuation access though expanded roadways. Therefore, there would be greater emergency evacuation opportunities during a wildfire under Alternative 1. However, because of the area of development in a high-risk fire zone, this impact would be significant and unavoidable for the reasons described under Impact HAZ-7, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because a smaller area of the transportation projects footprint would be located in fire hazard zones.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The projected land use growth footprint, sea level rise adaptation projects, and transportation projects could increase the routine transport, use, storage, and disposal of hazardous wastes in the region. These impacts are subject to regulations described in Section 3.9, “Hazards and Wildfire,” which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-1, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Construction associated with implementation of the TOC Growth Focus Alternative could result in impacts related to the use of hazardous materials and disturbance of potentially hazardous materials, including NOA. The most likely incidents involving construction-related hazardous materials are generally associated with minor spills or drips. Small fuel or oil spills are possible but would have a negligible impact on public

health. All hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations, and spills would be cleaned up in accordance with applicable regulations. As shown in **Table 4-28**, there would be a slightly smaller area of the land located in areas that may result in dispersal of NOA (i.e., ultramafic rock) under the TOC Growth Focus Alternative (650 acres) compared to the proposed plan (720 acres). This impact would be less than significant for the reasons described under Impact HAZ-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan due to a smaller area where earthmoving activities may cause dispersal of NOA.

During construction, demolition, and excavation activities, the changes in planned land use and transportation projects could potentially produce hazardous air emissions or involve the handling of extremely hazardous wastes. During operation, land use projects could use and produce hazardous materials that may be transported on roadways included in the plan. However, all projects would comply with federal and State regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level and, in particular, to protect schools. Individual projects would be subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be less than significant for the reasons described under Impact HAZ-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Throughout the plan area, there are many sites where historical releases of hazardous materials or wastes have occurred; these are listed in environmental databases in accordance with Government Code Section 65962.5. These sites range from small releases that have had localized effects on private property and have already been remediated to large-scale releases from long-term historical industrial practices that have had wider ranging effects on groundwater. These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be significant and unavoidable for the reasons described under Impact HAZ-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because regulations pertaining to hazardous materials would be implemented.

Projects within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport would not be approved by local agencies until project design plans have been reviewed and approved by the appropriate ALUC. The land use growth footprint under Alternative 2 would be similar to the proposed project (8,100 acres) therefore a similar amount of development would be located within 2 miles of an airport as compared to the proposed plan. These impacts are subject to regulations described in Section 3.9, which would reduce the potential for adverse effects to occur. This impact would be significant and unavoidable for the reasons described under Impact HAZ-5, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because regulations pertaining to airports would be implemented.

The forecasted increase of population and employment anticipated in the plan area could increase congestion on evacuation routes and slow evacuation. This could impair implementation of emergency response or evacuation plans, particularly if local plans rely on evacuation via personal vehicle. Although changes in land use would be reflected in updated emergency and evacuation plans, it is not known whether the changes would be sufficient to ensure adequate evacuation. Under the TOC Growth Focus Alternative, development patterns would be centered around existing developed TOC areas, creating issues of potential congestion on local roadways during evacuation procedures that would be similar to the proposed plan. Because evacuation during emergency conditions would be similarly impeded by vehicular congestion under the TOC Growth Focus Alternative, this impact would be significant and unavoidable for the reasons described under Impact HAZ-6, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Land development under the proposed plan could result in exposure of people to loss, injury, or death and damage to property adjacent to wildlands or where residences are intermixed with wildlands. Alternative 2 would result in the same amount of land in the sea level rise adaptation projects footprint (4,000 acres) and the transportation projects footprint (630 acres) in a fire hazard severity zone rated moderate, high, or very high as the proposed plan (**Table 4-29**). However, the alternative would result in a smaller land use growth footprint within a fire hazard severity zone rated moderate, high, or very high (450 acres) than the proposed plan (550 acres) (**Table 4-29**). This impact would be significant and unavoidable for the reasons described under Impact HAZ-7, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area land use growth footprint would occur within higher risk fire areas.

4.5.10 Hydrology and Water Quality

Table 4-30 provides a summary of the flood zone acreage associated with the proposed plan and alternatives.

Table 4-30: Flood Zone Acreage by Alternative

	Alternative	100-Year Flood Zone
Land Use Growth Footprint	Proposed Plan	4,400
	No Project Alternative	5,000
	Alternative 1	4,400
	Alternative 2	3,900
Sea Level Rise Adaptation Projects Footprint	Proposed Plan	69,400
	No Project Alternative	8,000
	Alternative 1	69,400
	Alternative 2	69,400
Transportation Projects Footprint	Proposed Plan	1,200
	No Project Alternative	80
	Alternative 1	840
	Alternative 2	1,200

Notes: Whole numbers have been rounded (between 11 and 999 to the nearest 10, between 1,000 and 1,000,000 to the nearest 100).
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

Compliance with water quality standards or waste discharge requirements could be affected by land development and construction of sea level rise adaptation projects and transportation projects by increasing the amount of impervious surface in the region, such as new paved areas, building rooftops, and parking lots. This increase of impervious surface has the potential to generate additional stormwater runoff. The No Project Alternative has a greater area of new developed land compared to the proposed plan (24,400 acres versus 8,100 acres, **Table 4-7**), which could thus result in a greater increase of impervious surfaces. Development of residential and commercial land uses, sea level rise adaptation projects, and transportation projects would not substantially degrade water quality in violation of water quality standards. Individual projects would adhere to existing regulations and would operate under the oversight of applicable regulatory agencies. This impact would be less than significant for the reasons described under Impact

HYDRO-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Groundwater levels can be affected by a decrease in recharge through increased impervious surfaces. The No Project Alternative would result in a greater area of new developed land compared to the proposed plan (24,400 acres versus 8,100 acres, **Table 4-7**), which would result in a greater increase of impervious surfaces. Development of residential and commercial land uses, sea level rise adaptation projects, and transportation projects would not substantially affect groundwater quality or quantity. Overall, this impact would be less than significant for the reasons described under Impact HYDRO-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Construction and earthmoving activities associated with land use development, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in sediment loading in local waterways and subsequent effects on water quality. Individual development and transportation projects would comply with requirements (e.g., adopt best management practices [BMPs] appropriate to local conditions), which would prevent the degradation of water quality. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact HYDRO-3, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Construction and earthmoving activities associated with land use development, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site. The No Project Alternative could result in new development and redevelopment that would have the potential to result in project-specific changes to existing drainage patterns. Altered drainage patterns have the potential to cause exceedance in the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Before commencement of major construction activities, project applicants would be required to develop a stormwater pollution prevention plan (SWPPP) in accordance with State Water Resources Control Board (SWRCB) requirements. The SWPPP would include BMPs that would be implemented during construction of individual development projects, sea level rise adaptation projects, and transportation projects under the plan. The applicant must receive approval of the SWPPP and submit a notice of intent before initiating construction. Individual development, sea level rise adaptation projects, and transportation projects is expected to adopt BMPs appropriate to local conditions. As shown in **Table 4-7**, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses compared to the proposed plan (24,400 acres versus 8,100 acres). Potential sea level rise could cause inundation in developed areas, which could alter drainage patterns. Once constructed, sea level rise adaptation projects would reduce this risk. The No Project Alternative includes fewer sea level rise adaptation projects and would thus have a lesser degree of protection against altered drainage patterns. This impact would be less than significant for the reasons described under Impact HYDRO-4, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because a greater area of undeveloped land would be developed.

Development associated with the land use growth footprint and transportation projects in identified flood hazard areas could involve support structures or other aboveground improvements in the floodway that could potentially obstruct floodwaters in some locations. All projects implemented under the No Project Alternative would be required to adhere to the appropriate local and State requirements that are designed to ensure that flooding conditions are not exacerbated and that water quality is not adversely affected. According

to existing regulations, implementation of the No Project Alternative is not anticipated to increase the rate or amount of surface runoff in a manner that would result in on- or off-site flooding, or substantial erosion or siltation. As shown in **Table 4-30**, there would be a greater area of the land use growth footprint in the 100-year flood hazard zone under the No Project Alternative (5,000 acres) compared to the proposed plan (4,400 acres). Sea level rise adaptation projects are intended to protect existing businesses, residences, and infrastructure from flooding. The No Project Alternative has a smaller (8,000 acres) sea level rise adaptation projects footprint than the proposed plan (69,400 acres) and has a smaller area in the 100-year flood hazard zone associated with transportation projects (80 acres versus 1,200 acres) and would, therefore, reduce future flood risks to a lesser degree. This impact would be less than significant for the reasons described under Impact HYDRO-5, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because while a lesser area of the land use growth and the transportation projects footprints would occur in the 100-year flood hazard zone, the No Project Alternative would have fewer sea level rise adaptation projects to provide flood risk protection.

Existing regulations guide growth away from hazardous areas, thus limiting the potential for risk related to the release of pollutants attributable to flooding, seiche, or tsunami. The No Project Alternative would have a smaller sea level rise adaptation projects footprint (8,800 acres) than the proposed plan (84,200 acres) and would have a higher potential for inundation in flood hazard, tsunami, and seiche zones than the proposed plan. This impact would be less than significant for the reasons described under Impact HYDRO-6, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because fewer sea level rise adaptation projects would be developed.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Compliance with water quality standards or waste discharge requirements could be affected by development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects by increasing the amount of impervious surface in the region, such as new paved areas, building rooftops, and parking lots. This increase of impervious surface has the potential to generate additional stormwater runoff. Alternative 1 has the same acreage of new developed land as the proposed plan (8,100 acres, **Table 4-7**), which would result in the same amount of increased impervious surfaces. Development of residential and commercial uses in land use growth footprint, sea level rise adaptation projects, and transportation projects would not substantially degrade water quality in violation of water quality standards because individual projects would adhere to existing regulations and would operate under the oversight of applicable regulatory agencies. This impact would be less than significant for the reasons described under Impact HYDRO-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Groundwater levels can be affected by a decrease in recharge through increased impervious surfaces. Compared to the proposed plan, Alternative 1 would result in the same acreage of new developed land and could thus result in the same increase in impervious surfaces (8,100 acres, **Table 4-7**). Development of the land use growth footprint, sea level rise adaptation projects, and transportation projects would not substantially affect groundwater quality or quantity. Overall, this impact would be less than significant for the reasons described under Impact HYDRO-2, and impacts under Alternative 1 would be **similar** those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Construction and earthmoving activities associated with land use development, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in sediment loading in local waterways and subsequent effects on water quality. Individual development in the land use growth footprint, sea level rise adaptation projects, and transportation projects would comply with requirements (e.g., adopt BMPs appropriate to local conditions), which would prevent the degradation of water quality. As shown in **Table 4-7**, Alternative 1 would result in the same

acreage of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). This impact would be less than significant for the reasons described under Impact HYDRO-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed.

Construction and earthmoving activities associated with land use development, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site. Implementation of Alternative 1 could result in new development and redevelopment that would have the potential to result in project-specific changes to existing drainage patterns. Altered drainage patterns would have the potential to cause exceedance in the capacity of existing or planned stormwater drainage systems or cause substantial additional sources of polluted runoff. Before commencement of major construction activities, project applicants would be required to submit a SWPPP to SWRCB that identifies the BMPs that would be implemented during construction of individual development projects associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects. The applicant must receive approval of the SWPPP and submit a notice of intent before initiating construction. Individual development and transportation projects are expected to adopt BMPs appropriate to local conditions. As shown in **Table 4-7**, Alternative 1 would result in the same acreage of land being converted from undeveloped to developed uses compared to the proposed plan (8,100 acres). Potential sea level rise could cause inundation in developed areas, which could alter drainage patterns. Sea level rise adaptation projects would reduce this risk. Alternative 1 includes the same sea level rise adaptation projects and thus has a similar degree of protection against altered drainage patterns. This impact would be less than significant for the reasons described under Impact HYDRO-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed and the same sea level rise adaptation projects would be implemented.

Development associated with the land use growth footprint and transportation projects in identified flood hazard areas could involve support structures or other aboveground improvements in the floodway that could potentially obstruct floodwaters in some locations. All projects implemented under Alternative 1 would be required to adhere to the appropriate local and State requirements that are designed to ensure that flooding conditions are not exacerbated and that water quality is not adversely affected. According to existing regulations, Alternative 1 implementation is not anticipated to increase the rate or amount of surface runoff in a manner that would result in on- or off-site flooding, or substantial erosion or siltation. As discussed above, there would be the similar acreage of the land use growth footprint in the 100-year flood hazard zone as under Alternative 1 (**Table 4-30**, 4,400 acres) and smaller area in the 100-year flood hazard zone associated with transportation projects (840 acres). Sea level rise adaptation projects are intended to protect existing businesses, residences, and infrastructure from flooding. Alternative 1 would include a similar acreage of sea level rise adaptation projects as the proposed plan (69,400 acres) and would therefore provide similar flood risk protection. This impact would be less than significant for the reasons described under Impact HYDRO-5, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because a similar area of the land use growth footprint and sea level rise projects footprint would occur in the 100-year flood hazard zone.

Existing regulations guide growth away from hazardous areas, thus limiting the potential for risk related to the release of pollutants attributable to flooding, seiche, or tsunami. Alternative 1 would have a similar sea level rise adaptation projects footprint as the proposed plan (84,200 acres) and would have similar protection from risks associated with inundation in flood hazard, tsunami, and seiche zones compared to proposed plan. This impact would be less than significant for the reasons described under Impact HYDRO-6, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because similar sea level rise adaptation projects would be developed.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Compliance with water quality standards or waste discharge requirements could be affected by development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects by increasing the amount of impervious surface in the region, such as new paved areas, building rooftops, and parking lots. This increase of impervious surface has the potential to generate additional stormwater runoff. The TOC Growth Focus Alternative would have a smaller area of new developed land compared to the proposed plan (7,700 acres versus 8,100 acres, **Table 4-7**), which would result in a smaller increase of impervious surfaces. Development of residential and commercial land uses, sea level rise adaptation projects, and transportation projects would not substantially degrade water quality in violation of water quality standards. Individual projects would adhere to existing regulations and would operate under the oversight of applicable regulatory agencies. This impact would be less than significant for the reasons described under Impact HYDRO-1, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Groundwater levels can be affected by a decrease in recharge through increased impervious surfaces. The TOC Growth Focus Alternative would result in a smaller area of new developed land compared to the proposed plan (7,700 acres versus 8,100 acres, **Table 4-7**), which would result in a smaller increase of impervious surfaces as compared to the plan. Development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects would not substantially affect groundwater quality or quantity. Overall, this impact would be less than significant for the reasons described under Impact HYDRO-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Construction and earthmoving activities associated with development of the land use growth footprint, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in sediment loading in local waterways and subsequent effects on water quality. Individual development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects would comply with requirements (e.g., adopt BMPs appropriate to local conditions), which would prevent the degradation of water quality. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed plan (7,700 acres versus 8,100 acres). This impact would be less than significant for the reasons described under Impact HYDRO-3, and impacts under Alternative 2 would be **less** than the those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Construction and earthmoving activities associated with development, sea level rise adaptation projects, and transportation projects would have the potential to alter existing drainage patterns, which could result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site. Implementation of Alternative 2 could result in new development and redevelopment that would have the potential to result in project-specific changes to existing drainage patterns. Altered drainage patterns have the potential to cause exceedance in the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Before commencement of major construction activities, project applicants would be required to submit a SWPPP to SWRCB that identifies the BMPs that would be implemented during construction of the individual development projects associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects. The applicant must receive approval of the SWPPP and submit a notice of intent before initiating construction. Individual development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects is expected to adopt appropriate BMPs required for local conditions. As shown in **Table 4-7**, the TOC Growth Focus Alternative would result in a smaller area of land being converted from undeveloped to developed uses compared to the proposed

plan (7,700 acres versus 8,100 acres). Potential sea level rise could cause inundation in developed areas, which could alter drainage patterns. The projected sea level rise adaptation projects would reduce this risk. The TOC Growth Focus Alternative includes the same sea level rise adaptation projects and would thus have a similar effect on drainage patterns. This impact would be less than significant for the reasons described under Impact HYDRO-4, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because a smaller area of undeveloped land would be developed.

Development associated with the land use growth footprint and transportation projects in identified flood hazard areas could involve support structures or other aboveground improvements in the floodway that could potentially obstruct floodwaters in some locations. Projects implemented under the TOC Growth Focus Alternative would be required to adhere to the appropriate local and State requirements that are designed to ensure that flooding conditions are not exacerbated and that water quality is not adversely affected. According to existing regulations, implementation of Alternative 2 is not anticipated to increase the rate or amount of surface runoff in a manner that would result in on- or off-site flooding, or substantial erosion or siltation. As discussed above, there would be a smaller area of the land use growth footprint in the 100-year flood hazard zone under the TOC Growth Focus Alternative compared the proposed plan (**Table 4-30**, 3,900 acres versus 4,400 acres) and the same area in the 100-year flood hazard zone associated with transportation projects (1,200 acres). Sea level rise adaptation projects are intended to protect existing businesses, residences, and infrastructure from flooding. The TOC Growth Focus Alternative includes a similar (69,400 acres) sea level rise adaptation projects footprint as the proposed plan and would therefore provide similar flood risk protection as the proposed plan. This impact would be less than significant for the reasons described under Impact HYDRO-5, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because a similar area of land use growth footprint and transportation projects footprint would occur in the 100-year flood hazard zone.

Existing regulations guide growth away from hazardous areas, thus limiting the potential for risk related to the release of pollutants attributable to flooding, seiche, or tsunami. The TOC Growth Focus Alternative has the same sea level rise adaptation projects as the proposed plan and would thus provide the same level of protection from risks associated with inundation in flood hazard, tsunami, and seiche zones as the proposed plan. This impact would be less than significant for the reasons described under Impact HYDRO-6, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because the same sea level rise adaptation projects would be developed.

4.5.11 Land Use, Population, and Housing

The alternatives assume the same projected housing and population levels in 2050 as the proposed plan. The No Project and TOC Growth Focus Alternatives differ from the proposed plan by where new housing and employment centers are located. However, the No New Highway Capacity and Transit Reinvestment Alternative assumes the same housing and employment centers as with the proposed plan. Please see Section 4.7, “Ability to Meet Project Objectives” for additional discussions related to displacement.

NO PROJECT ALTERNATIVE

Physical division of established communities is generally attributed to the development of roadways or other impediments that prohibit or limit travel within a developed area. Compared to the proposed plan, there would be fewer transportation projects that could require the acquisition of land in existing communities under the No Project Alternative. This impact would be significant and unavoidable for the reasons described under Impact LU-1 for the impacts of transportation projects, and impacts under the No Project Alternative would be **less** than those that would occur under the proposed plan because there would be fewer transportation projects.

Implementation of the No Project Alternative assumes that the land use growth footprint, transportation projects, and sea level rise adaptation projects would be consistent with general plan policies and zoning districts. Therefore, this impact would be less than significant because development under the No Project Alternative would be consistent with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect. Because the No Project Alternative would not conflict with general plan policies and zoning districts this impact would be less than significant for the reasons described under Impact LU-2, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Under the No Project Alternative, growth would occur consistent with current general plans and zoning, without an adopted regional plan, and assuming no new infrastructure projects beyond those currently under construction or those that have both full funding and environmental clearance. In comparison to the proposed plan, there are no regional strategies in the No Project Alternative to focus growth into specific geographic areas in the region. Instead, growth would occur consistent with current general plans and zoning and would therefore not result in substantial unplanned growth. This impact would be less than significant for the reasons described under Impact LU-3, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Displacement risk is a function of the location and availability of affordable housing near major job centers in a growing regional economy. As the growth in jobs (particularly those that pay higher wages) outpaces the supply of housing (particularly those that are affordable to lower-income households), the cost of housing inevitably rises faster than wages for all workers. This causes a greater risk of displacement within EPCs through 2050 despite an overall improvement in the risk of displacement regionwide compared to the proposed plan. This alternative lacks any coordinated regional policies, such as Strategies H1, H2, H4, and H5, to preserve and produce more affordable housing and therefore reduce the risk of displacement. However, the No Project Alternative would result in less redevelopment compared to the proposed plan, which would result in less housing replacement associated with redevelopment. Therefore, the No Project Alternative would result in less environmental impacts associated with redevelopment construction activities. The impact related to displacement of housing would be significant and unavoidable for the reasons described under Impact LU-4, impacts under the No Project Alternative would be **less** than those that would occur under the proposed plan because there would less redevelopment construction compared to the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Physical division of established communities is generally attributed to the development of roadways or other impediments that prohibit or limit travel within a developed area. Compared to the proposed plan, there would be a similar land use growth footprint (8,100 acres) that could require the acquisition of land under Alternative 1. However, the transportation projects' footprint under Alternative 1 (6,700 acres) would be smaller than the proposed plan (8,600 acres). This impact would be significant and unavoidable for the reasons described under Impact LU-1 for the impacts of transportation projects, and impacts under Alternative 1 would be **less** than those that would occur under the proposed plan because there would be reduced development of roadway projects as part of the transportation projects footprint.

Implementation of Alternative 1 could result in development associated with land use growth footprint, sea level rise adaptation projects, and transportation projects in areas that are not consistent with existing long-range plans, including local general plans, the Bay Plan, and LCPs. However, because the forecasted development pattern, sea level rise adaptation projects, and transportation projects that fall within the boundaries of the Bay Plan, LCPs, and the Delta Plan must demonstrate consistency with these plans and satisfy mitigation requirements as needed, Alternative 1 would not conflict with the environmental protection requirements imposed by these plans. Therefore, the potential for inconsistencies with general

plans and regional conservation plans would be the same under Alternative 1 as the proposed plan This impact would be less than significant for the reasons described under Impact LU-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Alternative 1 would concentrate growth in the same areas as with the proposed plan. This alternative would respond to projected growth similarly to the proposed plan and would therefore not result in substantial unplanned growth. This impact would be less than significant for the reasons described under Impact LU-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same areas would be developed and individual projects would be consistent with general plan policies and zoning districts.

Displacement risk is a function of the location and availability of affordable housing near major job centers in a growing regional economy. As the growth in jobs (particularly those that pay higher wages) outpaces the supply of housing (particularly housing that are affordable to lower-income households), the cost of housing inevitably rises faster than wages for all workers. Risk of displacement, overall and in EPCs, would be similar under Alternative 1 compared to the proposed plan because the housing growth pattern would be the same as the proposed plan and Alternative 1 would include similar locations for affordable housing near major job centers. Impacts related to displacement of housing would be significant and unavoidable for the reasons described under Impact LU-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Physical division of established communities is generally attributed to development of roadways or other impediments that prohibit or limit travel within a developed area. Compared to the proposed plan, Alternative 2 would include a similar number of transportation projects that could require the acquisition of land in existing communities, but the overall land use growth footprint would be less than the proposed plan (7,700 acres versus 8,100 acres, see **Table 4-7**). This impact would be significant and unavoidable for the reasons described under Impact LU-1 for the impacts of transportation projects, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because there would be the same number of transportation projects as the proposed plan.

Implementation of the TOC Growth Focus Alternative could result in development associated with land use growth footprint, sea level rise adaptation projects, and transportation projects in areas that are not consistent with existing long-range plans, including local general plans, the Bay Plan, and LCPs. However, because the forecasted development pattern, sea level rise adaptation projects, and transportation projects that fall within the boundaries of the Bay Plan, LCPs, and the Delta Plan must demonstrate consistency with these plans and satisfy mitigation requirements as needed, Alternative 2 would not conflict with the environmental protection requirements imposed by these plans. Therefore, the potential for inconsistencies with general plans and regional conservation plans would be the same under Alternative 2 as the proposed plan. This impact would be less than significant for the reasons described under Impact LU-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Alternative 2 would concentrate a substantially higher share of growth in TOC Policy Areas. This alternative would respond to projected growth and would therefore not result in substantial unplanned growth. This impact would be less than significant for the reasons described under Impact LU-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because individual projects would be consistent with general plan policies and zoning districts.

Displacement risk is a function of the location and availability of affordable housing near major job centers in a growing regional economy. Under the TOC Growth Focus Alternative, location of affordable housing, including deed-restricted affordable housing, would be placed closer to TOC Policy Areas compared to

the proposed plan. This causes a greater risk of displacement within the existing EPCs through 2050, despite an overall improvement in the risk of displacement regionwide compared to the proposed plan. This shift in housing development toward TOC Policy Areas indicates that less housing, including affordable housing, would be constructed in EPCs, meaning that fewer residents in the existing low-income communities and communities of color are able to remain in place through 2050. This would require a greater degree of replacement housing construction elsewhere and thus a greater potential for related environmental impacts. The impact related to displacement of housing would be significant and unavoidable for the reasons described under Impact LU-4, and impacts under Alternative 2 would be **greater** than those that would occur under the proposed plan because there would be a greater risk of displacement within the existing EPCs through 2050 and more replacement housing construction would be required under Alternative 2 compared to the proposed plan.

4.5.12 Noise

NO PROJECT ALTERNATIVE

Construction and operational noise has the potential to impact nearby sensitive receptors. The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in substantial construction noise levels such that nearby receptors could be adversely affected and applicable noise standards could be exceeded. As described under Impact NOISE-1, because there may be cases where noise-level reductions from implementation of mitigation would not be sufficient to reduce noise to an acceptable level, construction from implementation of the No Project Alternative would be significant and unavoidable, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in regional average noise increases and localized traffic-related noise levels that exceed applicable thresholds, resulting in a substantial permanent increase in noise in some areas. Depending on the location of development, noise levels would increase or decrease along some roadways in some counties. In addition, the land use growth footprint under the No Project Alternative is spread out more than under the proposed plan, which would distribute transportation noise throughout the region more, but may reduce it in areas that would become more dense under the proposed plan. Because the plan alternatives would result in varying degrees of noise levels distributed throughout the plan area, including traffic noise increases and threshold exceedances in some areas, substantial increases in stationary noise sources, and variations to the level of new or expanded transit services, it is not possible to determine the relative level of adverse effect for this area of impact. Furthermore, noise is assessed based on the presence of sensitive receptors to a noise generator, which cannot be reasonably determined within a large area and over a long period of time. In addition, noise levels decrease with distance and would not combine across the plan area. This impact would be significant and unavoidable for the reasons discussed under Impact NOISE-2, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Construction activities could generate substantial vibration levels, and the potential exists for pile-driving to occur within 50 feet of an older building, exceeding Caltrans-recommended levels for structural damage, and within 550 feet of an existing sensitive land use, exceeding levels for vibration annoyance recommended by the Federal Transit Administration (FTA). In addition, locating residential land uses in proximity to transit could also result in exposure of the future residents to vibration levels in excess of established standards. Information is not available to assess the relative difference to transit-related vibration levels under the No Project Alternative, nor the extent to which construction vibration would affect existing sensitive land uses. However, vibration impacts would occur under both the proposed plan and No Project Alternative. Because

these types of impacts are site specific, they are difficult to compare across a large site, such as the plan area. This impact would be significant and unavoidable for the reasons described under Impact NOISE-3, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

There are 38 airports, including public, private, and military airports, throughout the Bay Area. Projected development could potentially be located in proximity to existing airports such that applicable exterior and interior noise standards would be exceeded. Local land use compatibility standards contained in city and county general plans would typically discourage or require specific site review for construction of sensitive land uses in areas potentially impacted by aircraft noise. However, it is possible that projected development could be exposed to exterior and interior noise levels from existing airports or airstrips that exceed applicable standards. This impact would be significant and unavoidable for the reasons described under Impact NOISE-4, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in substantial construction noise levels such that nearby receptors could be adversely affected and applicable noise standards could be exceeded. For the reasons described under Impact NOISE-1, construction from projected development, sea level rise adaptation projects, and transportation projects would be significant and unavoidable, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in stationary noise increases in certain areas and localized traffic-related noise levels that exceed applicable thresholds, resulting in a substantial permanent increase in noise in some areas. Depending on the location of development, noise levels would increase on some roadways or decrease along some roadways in some counties. Generally, with consideration of traffic noise, Alternative 1 would result in reduced levels of vehicle commuters and an increase in commuters using alternative modes of transportation (walk, transit, bike, work-from-home) compared to the proposed plan. Alternative 1 would emphasize transit and active transportation in the plan area, increasing rail users compared to the proposed plan and thus would result in increased levels of transit-related noise compared to the proposed plan. The land use growth footprint under Alternative 1 would be similar to the proposed plan and the distribution of noise levels would thus be similar. Noise is assessed based on the presence of sensitive receptors to a noise generator, which cannot be reasonably determined within a large area and over a long period of time. In addition, noise levels decrease with distance and would not combine across the plan area. This impact would be significant and unavoidable for the reasons discussed under Impact NOISE-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Construction activities associated with land use growth, sea level rise adaptation projects, and transportation projects could generate substantial vibration levels, and the potential exists for pile-driving to occur within 50 feet of an older building, exceeding Caltrans-recommended levels for structural damage, and within 550 feet of an existing sensitive land use, exceeding FTA-recommended levels for vibration annoyance. In addition, locating residential land uses in proximity to transit could also result in exposure of the future residents to vibration levels in excess of standards established by FTA or Caltrans. New households included in the land use growth footprint forecast could exceed the recommended threshold for human disturbance of 72 velocity level in decibels (VdB) for sensitive receptors that are exposed to frequent amount of vibration events. Information is not available to assess the relative difference to transit-related vibration levels under Alternative 1, nor the extent to which construction vibration would affect existing sensitive land uses. However, vibration impacts would occur under both the proposed plan and Alternative 1. Because these types of impacts are site specific, they are difficult to compare across a large site, such as the plan area. This impact would be

significant and unavoidable for the reasons described under Impact NOISE-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

There are 38 airports, including public, private, and military airports, throughout the Bay Area. Projected development could potentially be located in proximity to existing airports such that applicable exterior and interior noise standards would be exceeded. Local land use compatibility standards contained in city and county general plans would typically discourage or require specific site review for construction of sensitive land uses in areas potentially impacted by aircraft noise. However, it is possible that projected development could be exposed to exterior and interior noise levels from existing airports or airstrips that exceed applicable standards. This impact would be significant and unavoidable for the reasons described under Impact NOISE-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in substantial construction noise levels such that nearby receptors could be adversely affected and applicable noise standards could be exceeded. For the reasons described under Impact NOISE-1, construction from projected development, sea level rise adaptation projects, and transportation projects would be significant and unavoidable, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

The land use growth footprint, sea level rise adaptation projects, and transportation projects that may result from implementation of the plan alternatives could result in stationary-source noise increases in certain areas and localized traffic-related noise levels that exceed applicable thresholds, resulting in a substantial permanent increase in noise in some areas. Depending on the location of development, noise levels would increase along some roadways and decrease along other roadways in some counties. Generally, with consideration of traffic noise, the TOC Growth Focus Alternative would result in reduced levels of vehicle commuters and increased commuters using alternative modes of transportation (walk, transit, bike, work-from-home) because development would be focused in TOC Policy Areas. Therefore, although roadway noise from personal vehicles would decrease, transit noise could increase with increased ridership. Although noise levels may be somewhat increased with increases in transit ridership, the distribution of noise levels would be different under Alternative 2 than the proposed plan because the land use growth footprint under the TOC Growth Focus Alternative would focus growth in TOC Policy Areas. Noise is generally assessed based on the presence of sensitive receptors to a noise generator, which cannot be reasonably determined within a large area and over a long period of time. In addition, noise levels decrease with distance and would not combine across the plan area. These types of impacts are site specific and are difficult to compare across a large site, such as the plan area. Therefore, impact would be significant and unavoidable for the reasons discussed under Impact NOISE-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Construction activities associated with land use growth, sea level rise adaptation projects, and transportation projects could generate substantial vibration levels, and the potential exists for pile-driving to occur within 50 feet of an older building, exceeding Caltrans-recommended levels for structural damage, and within 550 feet of an existing sensitive land use, exceeding FTA-recommended levels for vibration annoyance. In addition, locating residential land uses in proximity to transit could also result in exposure of the future residents to vibration levels in excess of standards established by FTA or Caltrans. New households included in the land use growth footprint forecast could exceed the recommended threshold for human disturbance of 72 VdB for sensitive receptors that are exposed to a frequent amount of vibration events. Information is not available to assess the relative difference to transit-related vibration levels under the TOC Growth Focus Alternative, nor the extent to which construction vibration would affect existing sensitive land uses. However, vibration impacts would occur under both the proposed plan and TOC Growth Focus Alternative. Because these types of impacts are site specific, they are difficult to compare across a large site, such as the plan area. This impact

would be significant and unavoidable for the reasons described under Impact NOISE-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

There are 38 airports, including public, private, and military airports, throughout the Bay Area. Projected development could potentially be located in proximity to existing airports such that applicable exterior and interior noise standards would be exceeded. Local land use compatibility standards contained in city and county general plans would typically discourage or require specific site review for construction of sensitive land uses in areas potentially impacted by aircraft noise. However, it is possible that projected development could be exposed to exterior and interior noise levels from existing airports or airstrips that exceed applicable standards. This impact would be significant and unavoidable for the reasons described under Impact NOISE-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

4.5.13 Public Services and Recreation

NO PROJECT ALTERNATIVE

The regional growth forecast could result in increases in demand for public services that exceed existing service capabilities and may require construction of new facilities or modifications to existing facilities to maintain adequate capital capacity, equipment, and personnel. Because MTC and ABAG do not have land use authority to adopt local land use plans or approve local land use development projects, land use development projects are ultimately controlled by local jurisdictions throughout the plan area. Future land use development projects would be required to undergo an evaluation of their contribution to public services demand prior to approval. In cases where a project results in increased demand, many jurisdictions require developers to pay impact fees to fund increased demand for public services; however, the amount and extent to which a project must mitigate additional demand would differ on a project-by-project basis depending on size and location and would be the responsibility of the implementing agency/project applicant. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives but would occur in different patterns. Forecasted population levels would result in the need for new public services facilities, the construction of which could cause significant environmental impacts, in different patterns between the No Project Alternative and proposed plan, but with no discernible difference in the level of adverse effect for this area of impact. This impact would be significant and unavoidable for the reasons described under Impact PSR-1, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Development associated with the land use growth footprint could increase demand for recreational services. Existing State requirements regarding the development of a complete general plan, including open space and conservation elements, require local jurisdictions to address impacts on recreational facilities. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives. Sea level rise adaptation projects and transportation projects would not result in population growth and therefore would not substantially affect recreation resources. Forecasted population levels would result in the need for new public services facilities in different patterns between the No Project Alternative and proposed plan. The construction of new or expanded recreational facilities may result in environmental impacts. This impact would be significant and unavoidable for the reasons described under Impact PSR-2, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The regional growth forecast could result in increases in demand for public services that exceed existing service capabilities and may require construction of new facilities or modifications to existing facilities to

maintain adequate capital capacity, equipment, and personnel. Because MTC and ABAG do not have land use authority to adopt local land use plans or approve local land use development projects, land use development projects are ultimately controlled by local jurisdictions throughout the plan area. Future land use development projects would be required to undergo an evaluation of their contribution to public services demand prior to approval. In cases where a project results in increased demand, many jurisdictions require developers to pay impact fees to fund increased demand for public services; however, the amount and extent to which a project must mitigate additional demand would differ on a project-by-project basis depending on size and location and would be the responsibility of the implementing agency/project applicant. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives but would occur in different patterns. Forecasted population levels would result in the need for new public services facilities in different patterns between Alternative 1 and proposed plan, but with no discernible difference in the level of adverse effect for this area of impact. This impact would be significant and unavoidable for the reasons described under Impact PSR-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Development associated with the land use growth footprint could increase demand for recreational services. Existing State requirements regarding the development of a complete general plan, including open space and conservation elements, require local jurisdictions to address impacts on recreational facilities. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives. Sea level rise adaptation projects and transportation projects would not result in population growth and therefore would not substantially affect recreation resources. Forecasted population levels would result in the need for new public services facilities in different patterns between Alternative 1 and proposed plan. The construction of new or expanded recreational facilities may result in significant environmental impacts. This impact would be significant and unavoidable for the reasons described under Impact PSR-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The regional growth forecast could result in increases in demand for public services that exceed existing service capabilities and may require construction of new facilities or modifications to existing facilities to maintain adequate capital capacity, equipment, and personnel. Because MTC and ABAG do not have land use authority to adopt local land use plans or approve local land use development projects, land use development projects are ultimately controlled by local jurisdictions throughout the plan area. Future land use development projects would be required to undergo an evaluation of their contribution to public services demand prior to approval. In cases where a project results in increased demand, many jurisdictions require developers to pay impact fees to fund increased demand for public services; however, the amount and extent to which a project must mitigate additional demand would differ on a project-by-project basis depending on size and location and would be the responsibility of the implementing agency/project applicant. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives but would occur in different patterns. Forecasted population levels would result in the need for new public services facilities in different patterns between the TOC Growth Focus Alternative and proposed plan, but with no discernible difference in the level of adverse effect for this area of impact. This impact would be significant and unavoidable for the reasons described under Impact PSR-1, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Development associated with the land use growth footprint could increase demand for recreational services. Existing State requirements regarding the development of a complete general plan, including open space and conservation elements, require local jurisdictions to address impacts on recreational

facilities. The magnitude of this impact is dependent on changes to population levels, which would be the same under all plan alternatives. Sea level rise adaptation projects and transportation projects would not result in population growth and therefore would not substantially affect recreation resources. Forecasted population levels would result in the need for new public services facilities in different patterns between the TOC Growth Focus Alternative and proposed plan. The construction of new or expanded recreational facilities may result in significant environmental impacts. This impact would be significant and unavoidable for the reasons described under Impact PSR-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

4.5.14 Public Utilities and Facilities

Impacts related to wastewater, stormwater, and solid waste are more localized in nature, and therefore the analysis is qualitative and focuses on the existing regulations, standards, and policy measures to address these localized impacts.

NO PROJECT ALTERNATIVE

As with the proposed plan, construction activities associated with land use growth, sea level rise adaptation projects, and transportation projects under the No Project Alternative would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Potential impacts on water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities would occur primarily from buildout under the land use growth footprint that may result from implementation of the No Project Alternative. Development outside urbanized areas could require the construction of new or expanded utilities infrastructure. Expansion of new infrastructure would be greater under the No Project Alternative than under the proposed plan because there would be a larger area of undeveloped land converted to developed uses (24,400 acres versus 8,100 acres, **Table 4-7**) and because there is a greater potential for greenfield development. This impact would be significant and unavoidable for the reasons described under Impact PUF-1, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because there would be a larger area of undeveloped land that would be developed.

Increases in water demand are primarily associated with increased population levels. Landscaping features associated with transportation projects may also require water supplies, depending on the requirements of the plant species used. The No Project Alternative would result in the same increase to population levels as the proposed plan. However, the land use growth footprint is greater under the No Project Alternative than under the proposed plan (24,400 acres versus 8,100 acres, **Table 4-7**), which would result in a less efficient water supply system (e.g., greater areas of irrigated landscaping). This impact would be significant and unavoidable for the reasons described under Impact PUF-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan because there would be a larger area of undeveloped land that would be developed.

Wastewater treatment demand would increase due to increases in population levels of individual service districts. The proposed plan and No Project Alternative include the same population projections, and thus a similar level of wastewater would be generated. The land use growth footprint would be different between the proposed plan and No Project Alternative; however, it is not possible to determine the extent to which different service providers would be affected because the timeline for the buildout of specific areas and future expansion plans of individual service districts is unknown. This impact would be significant and unavoidable for the reasons described under Impact PUF-3, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan because population projections are the same with the proposed plan and the No Project Alternative.

Solid waste generated by development associated with the land use growth footprint, sea level rise adaptation projects, and transportation projects could reduce the capacity of existing landfills, leading to earlier closure dates than currently anticipated and a need for increased landfill capacity. The proposed plan and No Project Alternatives include the same population projections, and a similar level of solid waste would be generated among the alternatives. This impact would be significant and unavoidable for the reasons described under Impact PUF-4, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Potential impacts on water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities would occur primarily from the land use growth footprint that may result from implementation of Alternative 1. Development outside urbanized areas could require the construction of new or expanded utilities infrastructure. Alternative 1 would involve the same level of new or expanded infrastructure development as the proposed plan because there would be the same acreage of undeveloped land converted to developed uses (8,100 acres, **Table 4-7**). This impact would be significant and unavoidable for the reasons described under Impact PUF-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed under Alternative 1 as with the proposed plan.

Increases in water demand are primarily associated with increased population levels. Landscaping features associated with transportation projects may also require water supplies, depending on the requirements of the plant species used. Alternative 1 would result in the same increase in population levels as the proposed plan. However, the land use growth footprint would be similar under Alternative 1 compared to the proposed plan (8,100 acres, **Table 4-7**). This impact would be significant and unavoidable for the reasons described under Impact PUF-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because the same acreage of undeveloped land would be developed under Alternative 1 as with the proposed plan.

Wastewater treatment demand would increase due to increases in population levels of individual service districts. The proposed plan and Alternative 1 include the same population projections, and thus a similar level of wastewater would be generated. Additionally, the land use growth footprint would be similar between the proposed plan and Alternative 1. This impact would be significant and unavoidable for the reasons described under Impact PUF-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan because population projections and growth footprint are the same with the proposed plan and Alternative 1.

The solid waste generated by development associated with land use growth footprint, sea level rise adaptation projects, and transportation projects could reduce the capacity of existing landfills, leading to earlier closure dates than currently anticipated and a need for increased landfill capacity. The proposed plan and Alternative 1 include the same population projections, and thus a similar level of solid waste would be generated among the alternatives. This impact would be significant and unavoidable for the reasons described under Impact PUF-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

Potential impacts on water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities would occur primarily from the land use growth footprint that may result from implementation of the proposed plan. Development outside urbanized areas could require the construction of new or expanded utilities infrastructure. Expansion of new infrastructure would be smaller

under the TOC Growth Focus Alternative than the proposed plan because there would be a smaller area of undeveloped land converted to developed uses (7,700 acres versus 8,100 acres, **Table 4-7**). This impact would be significant and unavoidable for the reasons described under Impact PUF-1, and impacts under Alternative 2 would be **less** than the impact that would occur under the proposed plan because there would be a smaller area of undeveloped land that would be developed.

Increases in water demand are primarily associated with increased population levels. Landscaping features associated with transportation projects may also require water supplies, depending on the requirements of the plant species used. The TOC Growth Focus Alternative would result in the same increase in population levels as the proposed plan. However, the land use growth footprint is less under the TOC Growth Focus Alternative than under the proposed plan (7,700 acres versus 8,100 acres, **Table 4-7**), which would result in a more efficient water supply system (e.g., smaller area of irrigated landscaping). This impact would be significant and unavoidable for the reasons described under Impact PUF-2, and impacts under Alternative 2 would be **less** than those that would occur under the proposed plan because there would be a smaller area of undeveloped land that would be developed.

Wastewater treatment demand would increase due to increases in population levels of individual service districts. The proposed plan and Alternative 2 include the same population projections, and thus a similar level of wastewater would be generated. The land use growth footprint would be different between the proposed plan (8,100 acres) and Alternative 2 (7,700 acres); however, it is not possible to determine the extent to which different service providers would be affected because the timeline for buildout of specific areas and future expansion plans of individual service districts is unknown. This impact would be significant and unavoidable for the reasons described under Impact PUF-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan because population projections are the same with the proposed plan and Alternative 2.

The solid waste generated by development associated with land use growth footprint, sea level rise adaptation projects, and transportation projects could reduce the capacity of existing landfills, leading to earlier closure dates than currently anticipated and a need for increased landfill capacity. The proposed plan and TOC Growth Focus Alternative include the same population projections, and thus a similar level of solid waste would be generated among the alternatives. This impact would be significant and unavoidable for the reasons described under Impact PUF-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

4.5.15 Transportation

Table 4-31 provides a summary of Bay Area travel behavior in 2050 under the proposed plan and alternatives. **Table 4-32** provides a comparison of average trip length by alternative. **Table 4-33** provides a comparison of journey to work method by alternative.

Table 4-31: Comparison of Bay Area Travel Behavior by Alternative in 2050

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Daily Commute Trips	8,883,000	9,019,000	8,880,000	8,877,000
Daily Non-Commute Trips	22,614,000	22,855,000	22,580,000	22,569,000
Total Daily Trips	31,497,000	31,873,000	31,460,000	31,446,000
Daily Vehicle Trips	22,513,000	24,762,000	22,364,000	22,306,000
Daily VMT	178,605,000	201,389,000	177,500,000	178,015,000
Daily VMT per Capita	18.6	21.0	18.5	18.5

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Daily Vehicle Hours of Recurring Delay	591,000	1,045,000	587,200	616,900
Daily Transit Boardings	3,282,000	2,043,000	3,497,000	3,399,000
Daily Transit Passenger Miles	21,907,000	12,924,000	23,333,000	22,546,000

Note: Whole numbers have been rounded, with the exception of per capita VMT. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as prison inmates.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

Table 4-32: Comparison of Daily Average Trip Length by Purpose by Alternative in 2050 (miles)

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Commute	9.2	9.6	9.2	9.2
Non-Commute	4.4	4.5	4.4	4.4
Regional total	5.7	5.9	5.8	5.8

Note: Figures may not sum due to independent rounding. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as prison inmates.
Source: Data provided by MTC and ABAG in 2025; complied by Ascent in 2025.

Table 4-33: Comparison of Journey to Work by Mode by Alternative in 2050

	Proposed Plan	No Project Alternative	Alternative 1	Alternative 2
Automobile ("Vehicle"), Drive Alone	31%	39%	31%	31%
Automobile, Other	17%	17%	17%	17%
Transit	14%	9%	15%	15%
Active Modes (Bike/Walk)	9%	6%	9%	9%
Work-from-Home	29%	29%	29%	29%

Note: Figures may not sum due to independent rounding. Population statistics reflect the total Bay Area population able to travel on the region's transport network; it does not include immobile, involuntary populations such as prison inmates. "Auto, Other" includes carpool and ride hail modes.
Source: Data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

NO PROJECT ALTERNATIVE

Under the No Project Alternative, housing growth would be more dispersed, while job growth would be slightly more concentrated in San Francisco and in the northern portion of the Bay Area. The No Project Alternative would include substantially lower funding for transportation strategies and no regional strategies to focus growth into specific geographic areas within the region. In contrast to the proposed plan, the No Project Alternative would not implement strategies that would reduce emissions, improve mobility and access, reduce congestion, and increase safety on the transportation system, consistent with federal, State, and local efforts. Because these strategies would not be implemented under the No Project Alternative, federal, State, and local efforts aimed at directing regional growth to infill areas and providing sustainable transportation options to reduce emissions, improve mobility and access, reduce congestion, and increase safety on the transportation system may not be promoted to the same extent as under the proposed plan. However, although the No Project Alternative would not promote these efforts, it would not necessarily conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. This impact would be less than significant for the reasons described under Impact TRA-1, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

The No Project Alternative would result in substantially lower levels of household growth in the proposed plan's Growth Geographies than the proposed plan and slightly higher levels of job growth in Growth Geographies (**Table 4-3 and Table 4-6**). This means that housing growth would be more dispersed, while

job growth would be slightly more concentrated in San Francisco and the northern portion of the Bay Area. As shown in **Table 4-31**, modeling indicates that the No Project Alternative would result in more daily trips (approximately 31.9 million versus 31.5 million) and less transit passenger use than the proposed plan (approximately 12.9 million daily passenger miles versus 21.9 million daily passenger miles). In addition, the No Project Alternative would result in longer trips than the proposed plan (5.9 miles versus 5.7 miles, **Table 4-32**) and a larger share of drive-alone, automobile-based commuting (39% versus 31%, **Table 4-33**). Overall, because VMT per capita would be greater under the No Project Alternative than the proposed plan (21.0 versus 18.6, **Table 4-31**), this impact would be significant and unavoidable for the reasons described under Impact TRA-2, and impacts under the No Project Alternative would be **greater** than those that would occur under the proposed plan.

Specific transportation projects under the No Project Alternative would be expected to follow the design guidelines and allowable uses established by the State or the local jurisdiction with authority over the individual project. The potential to increase transportation hazards due to geometric design features or incompatible uses would be less than significant for the reasons described under Impact TRA-3, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

Construction projects must conform to local regulations requiring maintenance of emergency access during construction and operation and would be required to produce and follow a construction transportation management plan. Therefore, the impact related to the potential to result in inadequate emergency access would be less than significant for the reasons described under Impact TRA-4, and impacts under the No Project Alternative would be **similar** to those that would occur under the proposed plan.

ALTERNATIVE 1: NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

Alternative 1 features the same level of household and job growth in the Growth Geographies as the proposed plan, with a focus on transit and active transportation. Compared to the proposed plan, this alternative would not have regionally significant roadway expansion and extension projects (as modified in Strategies T7 and T8), and funding from these projects would be allocated toward transit. Alternative 1 would align with other regional programs, plans, and policies, including MTC programs administering State and federal programs. Strategies T7 and T8 under this alternative would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. This impact would be less than significant for the reasons described under Impact TRA-1, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Alternative 1 would feature growth similar to the proposed plan (**Table 4-3 and Table 4-6**). However, additional funding would be invested in transit in lieu of highway projects that add lane-mileage to the system. As shown in **Table 4-31,** modeling indicates that Alternative 1 would result in slightly fewer daily trips (approximately 31.46 million versus 31.50 million) and slightly more transit passenger use than the proposed plan (approximately 23.3 million daily passenger miles versus 21.9 million daily passenger miles). In addition, Alternative 1 would result in slightly longer average trips than the proposed plan (5.8 miles versus 5.7 miles, **Table 4-32**) and the same share of drive-alone automobile-based commuting (31%, **Table 4-33**). VMT per capita would be less under Alternative 1 compared to the proposed plan (18.5 versus 18.6, **Table 4-31**). This impact would be significant and unavoidable for the reasons described under Impact TRA-2, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Specific transportation projects under Alternative 1 would be expected to follow the design guidelines and allowable uses established by the State or the local jurisdiction with authority over the project. The potential to increase transportation hazards due to geometric design features or incompatible uses would be less than significant for the reasons described under Impact TRA-3, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan.

Construction projects must conform to local regulations requiring maintenance of emergency access during construction and operation. Therefore, the potential to result in inadequate emergency access would be less than significant for the reasons described under Impact TRA-4, and impacts under Alternative 1 would be **similar** to those that would occur under the proposed plan**.**

ALTERNATIVE 2: TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative features a substantially higher share of growth in TOC Policy Areas throughout the Bay Area than under the proposed plan. To support this growth pattern, housing and jobs would be shifted toward major transit infrastructure. Such investments in funding for growth in areas served by major transit would enhance growth in communities that are lower-VMT places to live and work. The TOC Growth Focus Alternative's approach aligns with other regional programs, plans, and policies, including MTC programs administering State and federal programs. Thus, it would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The impact under TRA-1 would be less than significant, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

The TOC Growth Focus Alternative would result in similar levels of household growth in the proposed plan's Growth Geographies and slightly higher levels of job growth in Growth Geographies compared to the proposed plan (**Table 4-3** and **Table 4-6**). This means that housing growth would be similar, while job growth would be slightly more concentrated in the region's two largest job centers of San Francisco and the northern portion of the Bay Area. As shown in **Table 4-31**, modeling indicates that the TOC Growth Focus Alternative would result in slightly fewer daily trips than the proposed plan (approximately 31.4 million versus 31.5 million) and more transit passenger use than the proposed plan (approximately 22.5 million passenger miles versus 21.9 million passenger miles). In addition, under the TOC Growth Focus Alternative, there would be slightly longer average trips (5.8 miles versus 5.7 miles, **Table 4-32**) and a similar share of automobile-based commuting (31%, **Table 4-33**). Per capita VMT would be less under the TOC Growth Focus Alternative than the proposed plan (18.5 versus 18.6, **Table 4-32**). This impact would be significant and unavoidable for the reasons described under Impact TRA-2, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Specific transportation projects under Alternative 2 would be expected to follow the design guidelines and allowable uses established by the State or the local jurisdiction with authority over the project. The potential to increase transportation hazards due to geometric design features or incompatible uses would be less than significant for the reasons described under Impact TRA-3, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan.

Construction projects must conform to local regulations requiring maintenance of emergency access during construction and operation. Therefore, the potential to result in inadequate emergency access would be less than significant for the reasons described under Impact TRA-4, and impacts under Alternative 2 would be **similar** to those that would occur under the proposed plan**.**

4.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6(e)(2) states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives analyzed. **Table 4-34** (included at the end of this chapter) provides a comparison of the environmental effects of the alternatives in relation to the proposed plan to assist in understanding the relative differences in outcomes expected to result from implementation of the alternatives. This comparative information is useful in assessing environmental superiority among the alternatives.

The primary objectives of the plan are to identify strategies that will enable the Bay Area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges, such as the uncertainties posed by rising sea levels, economic cycles, and new technologies (see Section 4.7, "Ability to Meet Project Objectives"). A substantial level of development is required to accommodate the growth forecasts. Consequently, most of the impacts of the proposed plan and alternatives are similar in type and magnitude. Differences in impacts relate to the location and size of land use growth, sea level rise adaptation projects, and transportation projects footprints and to the ability of feasible policies to influence how development forecasted in the plan and its alternatives would proceed.

As discussed above in Section 4.5, "Comparative Impact Analysis of Alternatives," the No Project Alternative would result in two more significant-and-unavoidable impacts than the proposed plan (Impacts AQ-1 and GHG-4). Because the No Project Alternative would result in more significant-and-unavoidable impacts than the proposed plan, it would not be the environmentally superior alternative.

As shown in **Table 4-23**, the proposed plan, No New Highway Capacity and Transit Reinvestment Alternative (Alternative 1), and TOC Policy Area Alternative (Alternative 2) would have the same reduction (21%) in per capita GHG emissions in 2035, whereas the No Project Alternative would result in 0% reduction in per capita GHG emissions in 2035. Furthermore, the No New Highway Capacity and Transit Reinvestment Alternative would have the lowest daily VMT in 2050, followed by the TOC Growth Focus Alternative, proposed plan, and No Project Alternative, as reflected in **Table 4-31**. Although VMT and GHG emissions are not synonymous, daily VMT is the primary input into EMFAC, the mobile source emissions model to estimate GHG emissions.

The No New Highway Capacity and Transit Reinvestment and TOC Growth Focus Alternatives would result in the same number of less-than-significant and significant-and-unavoidable impacts as the proposed plan, based in part on the limitations on MTC's ability to impose mitigation on future consistent development projects. Overall, the TOC Policy Area Alternative would have lower acreage of new developed land, lower acreage of development in agriculturally zoned land, lower development in TAC Risk Areas, and lower acreage in Bay Area Critical Linkages. Although Alternative 1 and Alternative 2 would have the same daily VMT per capita, Alternative 1 would have a slightly lower daily VMT compared to the TOC Growth Focus Alternative. Even though the level or degree of resulting significant-and-unavoidable impacts would be similar under Alternatives 1 and 2, impacts would be reduced overall under Alternative 2, and Alternative 2 is environmentally superior to the other alternatives.

The following discussions provide additional information regarding the important relative differences between the proposed plan and alternatives:

- **Aesthetics and visual resources**: The No New Highway Capacity and Transit Reinvestment Alternative would result in similar land use growth, sea level rise adaptation, and transportation projects footprints, compared to the proposed plan and would thus have similar types of impacts. The TOC Growth Focus Alternative would result in smaller land use growth, sea level rise adaptation projects, and transportation projects footprints, compared to the proposed plan and would thus have similar types of impacts, but to a reduced degree. The No Project Alternative would also have similar types of impacts, but to a greater degree because a greater area of undeveloped lands would be converted to developed uses.
- **Agricultural and forestry resources**: The No New Highway Capacity and Transit Reinvestment Alternative would result in similar acres of converted Farmland and the TOC Growth Focus Alternative would result in greater acres of Farmland being converted to nonagricultural uses compared to the proposed plan. The No New Highway Capacity and Transit Reinvestment Alternative would result in similar acres of forest land being converted to other uses, and the TOC Growth Focus Alternative would result in fewer acres of forestland being converted to other uses compared to the proposed plan. The potential to result in changes to the existing environment that, because of their location or nature, could

result in conversion of Farmland to nonagricultural use or conversion of forestland to nonforest use would be similar among the alternatives. A substantially greater amount of agricultural land and forestlands would be affected under the No Project Alternative compared to the proposed plan.

- **Air quality**: The No New Highway Capacity and Transit Reinvestment and TOC Growth Focus Alternatives would have lower mobile source emissions than the proposed plan. The No Project Alternative would result in greater air emissions and would not include policies and the capital investments, defined by transportation strategies in the proposed plan, that would make it consistent with the relevant control measures in the 2017 Clean Air Plan. Therefore, the No Project Alternative would result in the greatest level of air quality impacts.
- **Biological resources**: The No New Highway Capacity and Transit Reinvestment Alternative would result in a similar degree of impact on special-status species, critical habitat, wetlands, and linkage connections compared to the proposed plan. The TOC Growth Focus Alternative would result in a lesser degree of impact on special-status species, critical habitat, wetlands, and Critical Linkages compared to the proposed plan. Overall, the No Project Alternative would have the greatest level of impact on biological resources compared to the proposed plan.
- **Climate change, greenhouse gases, and energy:** The No New Highway Capacity and Transit Reinvestment and TOC Growth Focus Alternatives would result in lower mobile source GHG emissions compared to the proposed plan. In terms of GHG emissions per capita, the No New Highway Capacity and Transit Reinvestment and TOC Growth Focus Alternatives would result in similar reductions as the proposed plan. The No Project Alternative would not meet the SB 375 GHG emissions reduction target of 19% below 2005 emissions by 2035 and would result in greater GHG emissions per capita than the proposed plan.
- **Cultural resources and tribal cultural resources**: The No New Highway Capacity and Transit Reinvestment Alternative would result in similar land use growth, sea level rise adaptation projects, and transportation projects footprints compared to the proposed plan. The TOC Growth Focus Alternative would result in smaller land use growth, sea level rise adaptation projects, and transportation projects footprints compared to the proposed plan. Overall, the No New Highway Capacity and Transit Reinvestment Alternative would have the similar cultural resources and tribal cultural resources impacts as the proposed plan, The TOC Growth Focus Alternative would have a lesser degree of cultural resources and tribal cultural resources impacts compared to the proposed plan. The No Project Alternative would also have similar types of impacts, but they would be greater comparatively because a greater area of undeveloped uses would be converted to developed uses.
- **Geology, seismicity, and mineral resources**: The No New Highway Capacity and Transit Reinvestment Alternative would have similar impacts and TOC Growth Focus Alternative would have lesser impacts on geology, seismicity, and mineral resources compared to the proposed plan. The acres of land use growth footprint, sea level rise adaptation projects footprint, and transportation projects footprint that overlap with Alquist-Priolo Zones are located in areas in very high and high liquefaction potential zones and that are located in areas of landslides would be similar for the No New Highway Capacity and Transit Reinvestment Alternative and lesser for the TOC Growth Focus Alternatives compared to the proposed plan. The No Project Alternative would have greater geology, seismicity, and mineral resources impacts than the proposed plan because its land use growth footprint is larger and includes greater areas of geologic hazard risk.
- **Hazards and wildfire**: Regarding hazards and wildfire impacts, the proposed plan and all of the alternatives are comparable and would mostly have the same types of less-than-significant and significant-and-unavoidable impacts and to a similar degree. Exceptions include potential exposure to NOA, which would be greatest under the No Project Alternative, and exposure of people to loss, injury, or death and damage to property adjacent to wildlands or where residences are intermixed with wildlands (similar as the proposed plan under Alternative 1, less under Alternative 2, and greater than the proposed

plan under the No Project Alternative). The No Project Alternative would have greater hazards and wildfire impacts than the proposed plan because its land use growth footprint is larger and includes greater areas of wildfire risk, but it would result in less impeded evacuations during emergency conditions.

- **Hydrology and water quality**: The alternatives would have similar hydrology and water quality impacts, but the impacts would be greater under the No Project Alternative, similar under the No New Highway Capacity and Transit Reinvestment Alternative, and similar under the TOC Growth Focus Alternative because the area of land use growth footprint and portion of land use growth footprint in the 100-year flood zone are similar, or greater under each alternative. The No Project Alternative would generally result in a greater potential of flood risks because it would not have as many acres of sea level rise adaptation projects as the proposed plan.
- **Land use**: The potential for division of an established community is generally attributed to the development of roadways or other impediments, which would be less under the No Project Alternative, and similar for the No New Highway Capacity and Transit Reinvestment Alternative and TOC Growth Focus Alternative compared to the proposed plan. Displacement of residents, requiring construction of replacement housing elsewhere results in the potential for significant environmental impacts related to new development. Risk of displacement, and thus development of replacement housing, would be lower under the TOC Growth Focus Alternative compared to the proposed plan because the housing growth pattern would be less. Under the No New Highway Capacity and Transit Reinvestment Alternative, the land use growth footprint would be similar to the proposed plan, and risk of displacement would thus be similar. Under the No Project Alternative, there would be a reduced land use growth footprint and less displacement compared to the proposed plan and thereby less replacement housing would be required.
- **Noise:** The plan alternatives would result in types of impacts similar to those of the proposed plan; however, increased noise levels would occur in different areas based on where development is located. Overall, the level of noise impacts under the plan alternatives would be similar to that of the proposed plan.
- **Public services and recreation:** The plan alternatives and proposed plan would have similar levels of impacts because jurisdictions would need to respond to changing population levels regardless of the land use growth footprint.
- **Public utilities and facilities**: The land use growth footprint of the No New Highway Capacity and Transit Reinvestment Alternative would be similar to the proposed plan and would result in similar impacts related to water supply and utility infrastructure. The land use growth footprint of the TOC Growth Focus Alternative would be less than the proposed plan and would result in reduced impacts related to water supply and utility infrastructure. The land use growth footprint of the No Project Alternative would be more spread out than that of the proposed plan and would result in greater impacts related to water supply and utility infrastructure.
- **Transportation**: The No New Highway Capacity and Transit Reinvestment and TOC Growth Focus Alternatives would result in similar VMT per capita, which is less than the proposed plan. The No Project Alternative would result in greater VMT per capita than the proposed plan. Transportation impacts that address consistency with programs, plans, ordinances, policies, roadway design, and emergency access would be similar among the plan alternatives.

Table 4-34: Summary Comparison of Impacts

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
3.2 Aesthetics and Visual Resources				
Impact AES-1: Have a substantial adverse effect on a scenic vista	SU	>	=	<
Impact AES-2: Substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway	SU	>	=	<
Impact AES-3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings and in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality	SU	>	=	<
Impact AES-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	SU	>	=	<
3.3 Agriculture and Forestry Resources				
Impact AGF-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use, or conflict with existing zoning for agricultural use, or a Williamson Act contract	SU	>	=	>
Impact AGF-2: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])	SU	>	=	<
Impact AGF-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use	SU	>	=	=
3.4 Air Quality				
Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan	LTS	>	=	=
Impact AQ-2: Result in a substantial net increase in construction-related emissions	SU	=	=	=
Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or State ambient air quality standard	SU	>	<	<
Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations	SU	>	=	=

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
Impact AQ-5: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	LTS	=	=	=
3.5 Biological Resources				
Impact BIO-1a: Have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NOAA Fisheries	SU	>	=	<
Impact BIO-1b: Have substantial adverse impacts on designated critical habitat for federally listed plant and wildlife species	LTS/M	>	=	<
Impact BIO-2: Have a substantial adverse effect on riparian habitat, State- or federally protected wetlands (including but not limited to marsh, vernal pool, coastal), or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by CDFW or USFWS, through direct removal, filling, hydrological interruption, or other means.	LTS/M	<	=	=
Impact BIO-3: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites	SU	<	<	<
Impact BIO-4: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or with provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan (NCCP); or other approved local, regional, or State HCP	LTS	>	=	<
Impact BIO-5: Have the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species	SU	>	=	<
3.6 Climate Change, Greenhouse Gases, and Energy				
Impact GHG-1: Result in a net increase in greenhouse gas emissions, either directly or indirectly, compared to existing 2015 conditions that may have a significant impact on the environment	SU	>	<	=
Impact GHG-2: Conflict with the Bay Area region's achievement of the GHG emissions reduction target of 19% below 2005 emissions by 2035 established by CARB pursuant to SB 375	LTS	>	=	=

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
Impact GHG-3: Conflict with an applicable State plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	SU	>	=	=
Impact GHG-4: Conflict with an applicable local plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases	LTS	>	=	=
Impact EN-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation	LTS	=	=	=
Impact EN-2: Conflict with or obstruct a State or local plan for renewable energy or energy efficiency	LTS	>	=	=
3.7 Cultural Resources and Tribal Cultural Resources				
Impact CUL/TCR-1: Cause a substantial adverse change in the significance of a historical resource as defined in Guidelines Section 15064.5	SU	>	=	<
Impact CUL/TCR-2: Cause a substantial adverse change in the significance of a unique archaeological resource as defined in Guidelines Section 15064.5	SU	>	=	<
Impact CUL/TCR-3: Disturb any human remains, including those interred outside of formal cemeteries	LTS	>	=	<
Impact CUL/TCR-4: Cause a substantial adverse change in the significance of a TCR, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe	SU	>	=	<
3.8 Geology, Seismicity, and Mineral Resources				
Impact GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault	LTS	<	=	<
Impact GEO-2: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking	LTS	>	<	<
Impact GEO-3: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction, lateral spreading, and subsidence	LTS	<	<	<
Impact GEO-4: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides	LTS	>	=	<

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
Impact GEO-5: Result in substantial soil erosion or the loss of topsoil	LTS	>	=	<
Impact GEO-6: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property	LTS	>	=	<
Impact GEO-7: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	SU	>	=	<
Impact MR-1: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or a locally-important mineral resources recovery site delineated on a local land use plan	LTS	>	=	<
3.9 Hazards and Wildfire				
Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	LTS	=	=	=
Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	LTS	>	<	<
Impact HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school	LTS	=	=	=
Impact HAZ-4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment	SU	=	=	=
Impact HAZ-5: Result in a safety hazard for people residing or working in the planning area for projects located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport	LTS	=	=	=
Impact HAZ-6: Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan	SU	<	=	=
Impact HAZ-7: Exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides due to projected land use patterns and infrastructure in or near State Responsibility Areas or land classified as very high hazard severity zones	SU	>	<	<

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
3.10 Hydrology and Water Quality				
Impact HYDRO-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality	LTS	>	=	<
Impact HYDRO-2: Substantially decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin	LTS	>	=	<
Impact HYDRO-3: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, or additional sources of polluted runoff	LTS	>	=	<
Impact HYDRO-4: Substantially alter existing drainage patterns, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in runoff that exceeds capacity of existing or planned stormwater drainage systems or results in flooding on- or off-site	LTS	>	=	<
Impact HYDRO-5: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows	LTS	>	>	=
Impact HYDRO-6: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation	LTS	>	=	=
3.11 Land Use, Population, and Housing				
Impact LU-1: Physically divide an established community	SU	<	<	=
Impact LU-2: Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect	LTS	=	=	=
Impact LU-3: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	LTS	=	=	=
Impact LU-4: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere	SU	<	=	>

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
3.12 Noise				
Impact NOISE-1: Generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	SU	=	=	=
Impact NOISE-2: Generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	SU	=	=	=
Impact NOISE-3: Generate excessive groundborne vibration or groundborne noise levels	SU	=	=	=
Impact NOISE-4: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels	SU	=	=	=
3.13 Public Services and Recreation				
Impact PSR-1: in substantial adverse physical impacts associated with the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, and other public facilities.	SU	=	=	=
Impact PSR-2: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment	SU	=	=	=
3.14 Public Utilities and Facilities				
Impact PUF-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which could cause significant environmental effects	SU	>	=	<
Impact PUF-2: Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years	SU	>	=	<

Impacts	Proposed Plan	No Project Alternative	No New Highway Capacity and Transit Reinvestment Alternative	TOC Growth Focus Alternative
Impact PUF-3: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments	SU	=	=	=
Impact PUF-4: Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals, and comply with federal, State, and local management and reduction statutes and regulations related to solid waste	SU	=	=	=
3.15 Transportation				
Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities	LTS	=	=	=
Impact TRA-2: Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b)	SU	>	=	=
Impact TRA-3: Substantially increase hazards due to geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	LTS	=	=	=
Impact TRA-4: Result in inadequate emergency access	LTS	=	=	=

Notes: LTS=less than significant
LTS/M=less than significant with mitigation incorporated
SU=significant and unavoidable
<=the alternative would result in less impact than the proposed plan
>= the alternative would result in greater impact than the proposed plan
= the alternative would result in a similar impact to the proposed plan

4.7 ABILITY TO MEET PROJECT OBJECTIVES

The State CEQA Guidelines require an EIR to describe a range of reasonable alternatives to the project, or to the location of the project, that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen some of the significant effects of the project and that it shall evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6). The following discussion describes the objectives of the proposed plan and provides a preliminary assessment of the extent to which each alternative will attain those objectives. The ultimate determination as to whether an alternative meets the project objectives will be made by the MTC and ABAG Board of Directors as part of its decision about the feasibility of the alternatives and based on the entirety of the record before it at the time of its decision. (See PRC Sections 21081.5 and 21081[a][3], CEQA Guidelines Section 15126.6[f][1].)

4.7.1 Objective 1: Address climate change by reducing carbon dioxide (CO_2) emissions pursuant to targets established by the California Air Resources Board (CARB); specifically, meet or exceed a 19% reduction in per-capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels.

The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative would exceed a 19% reduction in per capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels, achieving reductions of 21% or more. The No Project Alternative would not exceed a 19% reduction in per capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels. Overall, the No Project Alternative does not meet Objective 1.

NO PROJECT ALTERNATIVE

The No Project Alternative would fail to reduce CO_2 emissions according to targets established by CARB: a 19% reduction in per capita emissions from cars and light-duty trucks by 2035 relative to 2005 levels.

PROPOSED PLAN

The proposed plan would reduce per capita emissions from cars and light-duty trucks by 2035 by 21% relative to 2005 levels, which would meet the 19% reduction target.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Focus Alternative would reduce per capita emissions from cars and light-duty trucks by 2035 by 21% relative to 2005 levels, which would meet the 19% reduction target.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative would reduce per capita emissions from cars and light-duty trucks by 2035 by 21% relative to 2005 goals, which would meet the 19% reduction target.

4.7.2 Objective 2: House 100% of the region's projected growth by income level, and with no increase in in-commuters over the proposed plan baseline year.

In 2023, the Bay Area faced severe housing affordability challenges and underproduction across all income levels. The proposed plan, No Project Alternative, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative would house 100% of the region's projected growth by income level. Each scenario would avoid increased in-commuting and ensure the region can support future workforce needs. Although all alternatives meet the objective at the regional level, they differ in housing distribution and effectiveness in reducing cost burdens or improving access to opportunity.

NO PROJECT ALTERNATIVE

The No Project Alternative would accommodate 100% of the region's projected housing unit growth.

PROPOSED PLAN

The proposed plan would accommodate 100% of the region's projected housing unit growth.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT FOCUS ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative would accommodate 100% of the region's projected housing unit growth.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Policy Area Focus Alternative would accommodate 100% of the region's projected housing unit growth.

4.7.3 Objective 3: Ensure that all current and future Bay Area residents and workers have sufficient housing options they can afford by reducing how much residents spend on housing and transportation and by producing and preserving more affordable housing.

The combination of housing and transportation costs for Bay Area residents in 2023 was high: the average household spent 42% of their income on housing and transportation, with low-income households facing a combined burden of 94%. Deed-restricted affordable housing accounted for only 4% of the regional stock and just 2% in historically exclusionary HRAs. The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative each significantly reduce household cost burdens and increase the supply of affordable housing. The No Project Alternative makes minimal progress on both.

The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative would ensure sufficient housing options for current and future Bay Area residents and workers through implementation of policies that plan for sufficient housing at all income levels, lower transportation costs for those that are most burdened, and universal basic income provisions. Overall, the No Project Alternative does not meaningfully address Objective 3.

NO PROJECT ALTERNATIVE

Under the No Project Alternative, modeling results indicate that Bay Area households would spend 82% of their income on housing and transportation combined in 2050, compared to 94% in 2023. Without increased subsidies for affordable housing, housing cost burden remains high at 40% in 2050, down slightly from 42% in 2023. Housing costs would remain high, with low-income households still spending 59% of their income, and all households at 29% in 2050. Transportation cost burdens remain largely unchanged. Deed-restricted affordable housing would increase slightly, from 4% to 6% regionwide and from 2% to 4% in HRAs—well below the levels needed to meet regional demand.

PROPOSED PLAN

The proposed plan would reduce the burden of housing and transportation costs for all households from 42% in 2023 to 32% in 2050. Low-income households would spend 47% of their incomes on housing and transportation, a 46-point reduction from 2023, which would meaningfully decreases disparities that burden households with low incomes today. All households would spend 32% on households and transportation, down from 42% from 2023. Housing costs for low-income households would drop from

70% in 2023 to 28% in 2050, and transportation costs from 24% to 18%. The share of deed-restricted affordable housing would increase to 27% regionwide by 2050 and 23% in HRAs, ensuring housing options are available in historically exclusionary areas.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT FOCUS ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative would perform similarly to the proposed plan. Combined housing and transportation cost burdens would be 46% for low-income households and 32% for all households in 2050. Housing and transportation costs would closely align with the proposed plan and deed-restricted affordable housing would reach 27% regionwide and 23% in HRAs in 2050. This alternative offers equivalent outcomes in terms of affordability and equity as the proposed plan.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative would achieve the same reductions in 2050 in cost burdens—46% for low-income households and 32% for all households—as the proposed plan and the No New Highway Capacity and Transit Reinvestment Alternative. While affordable housing in HRAs would reach 22% (slightly below the proposed plan), regionwide deed-restricted housing would reach 28%—the highest of any alternative—suggesting a marginal advantage in overall affordability outcomes.

4.7.4 Objective 4: Support an expanded, well-functioning, safe, and multimodal transportation system that connects the Bay Area by improving access to destinations and by ensuring residents and workers have a transportation system they can rely on.

In 2023, 43% of Bay Area households were located within a half mile of high-frequency transit (defined as a site containing any of the following: (1) a rail or bus rapid transit station; (2) a ferry terminal served by either a bus or rail transit service; or (3) the intersection of two or more bus routes with a headway of 15 minutes or less during the morning and afternoon peak commute periods), with 53% of low-income households enjoying that proximity. On average, residents could access 19% of the region's jobs within a 30-minute drive and 3.5% within a 45-minute transit journey, including walking and waiting time. Access was generally higher in EPCs. Without major investments, these accessibility and reliability metrics are at risk of stagnating or worsening as the region grows.

The proposed plan and its alternatives would substantially expand access to high-quality transit and improve connectivity to jobs via all travel modes. Compared to 2023, the share of households and jobs near frequent transit would increase significantly, while job accessibility—especially via transit—would improve modestly across the region. The No New Highway Capacity and Transit Reinvestment Alternative would yield slight gains in transit access and reliability, whereas the TOC Growth Focus Alternative would concentrate growth in transit-oriented areas, reinforcing transit accessibility. The No Project Alternative, in contrast, would result in worsening congestion and crowding, with only marginal gains in accessibility.

The No Project Alternative would fail to meaningfully improve access or reliability and does not meet Objective 4. The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative each improve multimodal access and connectivity, successfully meeting the objective.

NO PROJECT ALTERNATIVE

By 2050, 46% of all households and 54% of low-income households would live within a half mile of frequent transit—slightly higher than in 2023 but reflecting limited network expansion. Transit

accessibility would reach 4% of regional jobs in 2050, up from 4% in 2023. However, freeway travel times would increase substantially due to worsening congestion, and transit crowding would intensify without significant investment. The number of jobs reachable by automobile within 30 minutes would decline as a percentage of total jobs (15%), although the absolute number would grow due to regional job growth. Accessibility outcomes would remain somewhat better in EPCs than for the region overall.

PROPOSED PLAN

The proposed plan would significantly improve access to frequent transit, with 62% of all households and 84% of low-income households located within a half mile of high-quality transit. Transit access to jobs would increase to 5% regionwide, with 8% of jobs accessible to EPC residents. Policies, such as means-based tolling, increased transit service, and parking pricing, would help manage travel demand and congestion, resulting in automobile job access increasing to 18% in 2050—an improvement over 2023 and the No Project Alternative. Transit crowding would remain a concern but would decrease slightly with capacity investments and service upgrades.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

This alternative would perform comparably to the proposed plan but with slightly improved transit access due to higher frequency service and greater investment in transit infrastructure. Transit-accessible jobs reach would be 6% regionwide in 2050, the highest of all alternatives. Walk and bike access to jobs would also improve marginally. Crowding would be somewhat reduced for key local transit operators, and in a few corridors, freeway travel times improve slightly compared to the proposed plan. However, removal of express lanes could slightly offset these gains for some travelers.

TOC GROWTH FOCUS ALTERNATIVE

TOC Growth Focus Alternative would mirror the proposed plan in performance, with 84% of low-income households and 62% of all households near frequent transit in 2050. Transit job accessibility would be at 5% regionwide and 9% for EPC residents. Concentrated development in TOCs would enhance walkability and job proximity. Though transit crowding persists, this alternative would support reduced automobile dependency through better land use and improved local transit connections.

4.7.5 Objective 5: Support an inclusive region where people from all backgrounds, abilities, and ages can remain in place with full access to the region's assets and resources by creating more inclusive communities and reducing the risk that Bay Area residents are displaced

Regionwide, the share of neighborhoods that experience a net loss in the number of households with low incomes between 2015 and 2050 is 49%, and the number of neighborhoods that experience a decline in the share of low-income households is 52%. Although these losses reflect in some cases involuntary circumstances for lower-income households (traditionally defined as "displacement" and "gentrification"), this metric is also capturing households with low incomes who are relocating to Growth Geographies—neighborhoods near frequent transit or in High-Resource Areas—where new subsidized affordable housing would be developed under the proposed plan strategies.

To illustrate this dynamic, the proposed plan results for this metric are presented in two ways: with and without the plan's affordable housing strategies included. The proposed plan outcomes compare

favorably to the No Project Alternative when no affordable housing strategies are included, with fewer tracts experiencing losses or declining shares of low-income households. The proposed plan results with affordable housing strategies included demonstrate how many households with lower incomes would choose to relocate if given the opportunity to lower housing costs and access better transit options.

Taken together, these results show why the No Project Alternative does not advance Objective 5. Without the affordable housing strategies in the proposed plan, more neighborhoods lose low-income households, displacement pressures remain unmitigated, and access to high-resource communities is constrained. In contrast, the proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative with affordability strategies provide greater opportunities for households with low incomes to remain in place or relocate to inclusive, high-opportunity areas.

NO PROJECT ALTERNATIVE

This scenario would result in a shift in the region's income distribution, with households with low incomes comprising a higher share of the population by 2050. Regionwide, the share rises from 25% in 2023 to 28% in 2050 under the No Project Alternative. Opportunity-rich areas also see modest increases: Transit-Rich HRAs rise from 22% to 25%, all TRAs from 31% to 33%, and all HRAs from 18% to 21%. In EPCs, the trend varies by baseline: using ACS 2014–2018, the share increases from 41% to 43%, while under ACS 2018–2022, it holds steady at 41%. While these increases highlight that a greater share of the region's residents will be households with low incomes, they do not on their own signal more inclusive outcomes.

PROPOSED PLAN

The proposed plan would enable more inclusive communities by expanding affordable housing in HRAs and transit-rich neighborhoods. By 2050, the share of low-income households would increase to 34% in transit-rich HRAs and 20% in all HRAs. This corresponds with a modest decrease in EPCs (from 43% to 41%), indicating that more low-income households would be relocated to higher-opportunity areas.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative would achieve similar outcomes to the proposed plan with minor shifts in low-income households. The share of low-income households in HRAs would rise slightly to 25%, and in TRAs fall to 37% due to higher overall growth in those areas.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative would result in greater emphasis on shifting housing growth into HRAs, increasing the share of low-income households in those areas to 27%. However, this alternative would result in changes in EPCs, where the displacement risk would rise to 44% (versus 40% in the proposed plan).

4.7.6 Objective 6: Conserve the region's natural resources, open space, clean water, and clean air with the intent of improving health of Bay Area residents and workers and improving the health of the environment locally and globally.

In 2023, 60% of Bay Area commuters travel using a car, including 39% by single-occupancy vehicle. High levels of automobile dependency make achieving State-mandated emissions targets difficult and hinder safety goals. Annual fatalities and injuries due to vehicle collisions occurred at a rate of 5.8 per 100,000 residents in 2023. Daily $PM_{2.5}$ emissions were 1.6 tons in 2023, and per capita GHG emissions had declined

20% relative to 2005 levels—short of State climate targets. Park access averaged 4.7 acres per 1,000 residents, and regional open space totaled 113 acres per 1,000 residents in 2023.

The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative would conserve the region's natural resources, open space, clean water, and clean air through implementation of policies that improve public health and improve local and global environmental outcomes. Each of the three build alternatives achieves or exceeds CARB's GHG targets, reduces fatality and injury rates, and significantly expands resilience investments. Conversely, the No Project Alternative would result in worsening air quality, higher emissions than the alternatives (although lower than 2023 emissions due to fleet improvements), and no meaningful climate resilience protections.

The No Project Alternative fails to advance health, climate, or resilience goals and would not meet Objective 6. The proposed plan, No New Highway Capacity and Transit Reinvestment Alternative, and TOC Growth Focus Alternative all succeed in improving environmental conditions and reducing risks, effectively addressing Objective 6.

NO PROJECT

Overall, the No Project Alternative would result in greater impacts on the region's natural resources, open space, and air quality. By 2050, commuting by car would remain dominant at 56% (including 39% single-occupancy), annual fatalities and injuries would increase to 6.4 and 28 per 100,000 residents, and $PM_{2.5}$ emissions would rise to 1.9 tons daily. These trends would negatively affect public health. GHG emissions per capita would decline by 38% in 2050 relative to a 2005 baseline. However, the No Project Alternative would result in a 0.4% increase in GHG emissions in 2050 relative to 2005, when fuel efficiency gains are excluded.

Park space would decline to 3.8 acres per 1,000 residents, and open space would decline to 91.1 acres per 1,000 residents, resulting in reduced open space and recreational opportunities. As a result, the No Project Alternative would not meaningfully address regional health, safety, or climate resilience needs.

PROPOSED PLAN

The proposed plan would reduce single-occupancy vehicle use to 36% and overall automobile commuting to 53%fatalities and injuries would decline to 4.3 and 20.2 per 100,000 residents. $PM_{2.5}$ emissions are estimated to increase to 1.7 tons daily, compared to 1.6 tons daily in 2023. GHG emissions per capita would be reduced by 44% relative to a 2005 baseline, and the plan would achieve a 13% reduction in 2050 relative to 2005, when fuel efficiency gains are excluded.

Park access would decrease to 4.3 acres per 1,000 residents, down from 4.7 acres in 2023, while publicly accessible open space would increase to 140.7 acres per 1,000 residents. Development would also be almost entirely confined within urban growth boundaries, further supporting environmental goals. Therefore, the proposed plan would meaningfully address regional health, safety, or climate resilience needs.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative would result in reduced impacts on the region's natural resources, open space, and air quality, creating a healthier and safer region for residents. Outcomes under the No New Highway Capacity and Transit Reinvestment Alternative closely match the proposed plan. By 2050, single-occupancy vehicle and overall automobile commuting would consistent with the proposed plan. Annual fatalities and injuries would decline slightly further, to 4.2 and 20.1 per 100,000 residents. $PM_{2.5}$ emissions would remain consistent with the proposed plan at 1.7 tons daily. GHG emissions per capita would fall slightly more than under the proposed plan—by 45% in 2050

relative to a 2005 baseline. Additionally, this alternative would achieve a 22% reduction in emissions by 2050 relative to 2005, when fuel efficiency gains are excluded.

Park access and publicly accessible open space per 1,000 residents would remain consistent with the proposed plan. Therefore, the No New Highway Capacity and Transit Reinvestment Alternative would meaningfully address regional health, safety, or climate resilience needs.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative mirrors the outcomes of the No New Highway Capacity and Transit Reinvestment Alternative and the proposed plan and result in reduced impacts on the region's natural resources, open space, and air quality. By 2050, single-occupancy vehicle use and overall automobile commuting would be consistent with the proposed plan. Annual fatalities and injuries would also decline to 4.2 and 20.0 per 100,000 residents, the same as the No New Highway Capacity and Transit Reinvestment Alternative and slightly better than the proposed plan. $PM_{2.5}$ emissions would remain consistent with the proposed plan. GHG emissions per capita would decline by 45% in 2050 relative to 2005, the same the No New Highway Capacity and Transit Reinvestment Alternative. Additionally, the TOC Growth Focus Alternative would achieve a 21% reduction by 2050 relative to 2005, when fuel efficiency gains are excluded, compared to 22% under the No New Highway Capacity and Transit Reinvestment Alternative and 13% under the proposed plan.

Park access and publicly accessible open space per 1,000 residents would remain consistent with the proposed plan. Development would also be almost entirely confined within urban growth boundaries, further supporting environmental goals. Therefore, the TOC Growth Focus Alternative would meaningfully address regional health, safety, and climate resilience needs.

4.7.7 Objective 7: Support the creation of quality job opportunities for all and ample fiscal resources for communities by enabling the Bay Area economy to thrive and supporting the recovery of the region's downtowns from the pandemic.

The three largest downtowns in the Bay Area (Oakland, San Franscisco, and San Jose) would have an 37% increase in in-person workers in 2050 as compared to 2023, while there would be a 28% increase in residents in these three downtowns. With implementation of the plan TRAs, PPAs, and PDAs would experience a large share of job growth in the region at 50%, 8%, and 52% respectively in 2050.

In 2023, the Bay Area's jobs-housing ratio was 1.44. Counties like San Francisco (1.82) and Santa Clara (1.66) were job-rich, whereas Solano (0.86) and Contra Costa (1.03) were housing-rich. Commute distances averaged 10.6 miles for low-income workers and 12.0 miles for all workers in 2023. Although all alternatives support economic growth, they differ in their ability to rebalance job and housing locations.

The proposed plan and No New Highway Capacity and Transit Reinvestment Alternative would promote better jobs-housing balance through infill housing in job centers and new employment in housing-rich areas. These shifts would help reduce average commute distances and improve access for low-income workers. The TOC Growth Focus Alternative emphasizes growth in already job-rich areas and would not improve balance as effectively. The No Project Alternative would leave existing imbalances in place.

The No Project Alternative would not meet Objective 7. The proposed plan and No New Highway Capacity and Transit Reinvestment Alternative would make meaningful progress toward regional jobs-housing balance. The TOC Growth Focus Alternative would result in more limited improvements.

The No Project Alternative would have the smallest job growth by 2050 at 30%, followed by the Alternative 2 that would have a 36% growth in the number of jobs. The proposed plan and Alternative 1 would have the greatest growth in number of jobs at 44% growth by 2050.

NO PROJECT

The No Project Alternative would direct 72% of new jobs within Growth Geographies, with 50% in TRAs, 8% in PPAs, and 52% in PDAs. Overall, the regional jobs-housing ratio would remain essentially unchanged, with only modest shifts at the county level. Santa Clara, a job-rich county, would see improvement as its ratio declines from 1.66 to 1.47, reflecting increased housing growth in a historically job-heavy area. By contrast, Sonoma, a housing-rich county, would shift in the opposite direction, with its ratio increasing from 1.14 to 1.29, indicating relatively more job growth than housing. Commute distances would show only minor improvements compared to 2023, with low-income workers traveling 9.7 miles on average and all workers 11.9 miles.

PROPOSED PLAN

The proposed plan would direct 75% of new jobs to Growth Geographies, including 52% in TRAs, 6% in PPAs, and 54% in PDAs. While the overall regional jobs-housing ratio would remain relatively stable, notable shifts would occur in individual counties. Job-rich counties such as Alameda and San Francisco would see improvements, with Alameda's ratio declining from 1.48 to 1.32 and San Francisco's from 1.91 to 1.66, reflecting the addition of significant new housing in historically job-heavy areas. Meanwhile, housing-rich counties would attract more employment, with Contra Costa's ratio improving from 1.03 to 1.07, Solano's from 0.86 to 1.05, and Sonoma's from 1.14 to 1.25. These shifts in housing and employment patterns would help shorten commute distances, with average trips for low-income workers decreasing from 10.6 to 8.7 miles and for all workers from 12.0 to 11.1 miles.

NO NEW HIGHWAY CAPACITY AND TRANSIT REINVESTMENT ALTERNATIVE

The No New Highway Capacity and Transit Reinvestment Alternative mirrors the proposed plan across the distribution of new jobs in Growth Geographies, regional and county-level jobs-housing ratios, and commute distances, and would result in the same outcomes.

TOC GROWTH FOCUS ALTERNATIVE

The TOC Growth Focus Alternative would direct 76% of new jobs to Growth Geographies, slightly higher than the 75% in the proposed plan, with modest increases across TRAs (53% vs. 52%), PPAs (7% vs. 6%), and PDAs (56% vs. 54%). Shifts in jobs-housing ratios would differ from the proposed plan. Alameda would see no change, while San Francisco would improve more substantially, dropping to 1.55 compared to 1.66 under the proposed plan, reflecting greater housing growth in a job-rich area. By contrast, Santa Clara would worsen relative to the proposed plan, rising to 1.80 instead of improving to 1.73, indicating additional job growth in an already job-heavy county. Among housing-rich counties, the TOC Growth Focus Alternative would generally produce stronger gains than the proposed plan, though Solano and Sonoma would see smaller improvements than under the proposed plan. Commute distances would also be slightly longer than the proposed plan, averaging 8.8 miles for all workers and 11.2 miles for low-income workers.

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5 OTHER CEQA-MANDATED SECTIONS

This chapter summarizes the significant irreversible environmental changes, significant and unavoidable impacts, growth-inducing impacts, cumulative impacts, and impacts found not to be significant associated with the proposed plan. These subject areas are evaluated based on the analysis in Sections 3.2 through 3.15 of this EIR.

5.1 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Pursuant to Section 15126.2(d) of the CEQA Guidelines, an EIR must identify any significant irreversible environmental outcomes that could result from the implementation of a proposed project. These may include current or future uses of nonrenewable resources and secondary or growth-inducing impacts that commit future generations to similar uses. CEQA requires that irretrievable commitments of resources be evaluated to ensure that such current consumption is justified.

The entire plan area includes approximately 4.4 million land acres. The regional growth forecast projects the region will add 1.4 million jobs to just over 5.4 million total jobs between 2020 and 2050. Population is forecasted to grow by 1.8 million people to 9.6 million. This population will comprise over 3.8 million households, an increase of nearly 1 million households from 2020. Total population, employment, households, and associated housing units are identified in **Table 2-15**.

As part of the proposed plan, specific geographic areas—known as Growth Geographies—are designated and prioritized to accommodate the regional growth forecast. The proposed plan's core approach for leveraging the plan's strategies remains "focused growth" in existing communities along the existing transportation network, as well as communities with well-resourced schools and easy access to jobs, parks, and other amenities. Though not entirely irreversible, the forecasted development pattern that would result from implementation of the proposed plan would be difficult to change once local governments have taken action to approve development consistent with the proposed plan. If implemented, the plan's forecasted development pattern reflects a long-term commitment of these areas to urban uses. As noted in Chapter 2, "Project Description," the region's cities and counties retain local land use authority and local jurisdictions would continue to determine where future development occurs.

For the purposes of this analysis, consideration of the proposed plan in the context of resource commitment that would occur absent the proposed plan is relevant. The proposed plan uses the Growth Geographies and land use strategies to influence the forecasted development pattern by affecting the location, use, intensity, and density of forecasted development. The plan's land use strategies are intended to achieve regional goals and comply with Senate Bill (SB) 375's greenhouse gas (GHG) emissions reduction mandate and SB 375's mandate to ensure that a mix of housing types are available for all economic segments of the population across the region. As compared to existing conditions—as well as those future conditions under many of the existing general plans of Bay Area jurisdictions— implementation of the proposed plan would result in a more densely and intensely developed land use pattern, with more growth concentrated on less land (see the discussion of the No Project Alternative in Chapter 4, "Alternatives"). The result would be improved utilization of already developed land and better utilization of new land to be converted at the urban edge or in undeveloped areas of the plan area.

While use of nonrenewable energy and fuel; conversion of agriculture, open space, and habitat; release of pollutants emissions into the atmosphere; and climate change effects are in and of themselves generally irreversible resource commitments, the fact that the proposed plan changes (slows) the rate of

use of these resources is a beneficial outcome. Overall, implementation of the proposed plan would commit existing and future generations to a more efficient use of nonrenewable resources than under presently planned conditions.

Irretrievable commitments of non-renewable resources associated with the projected change in land use, and with the sea level rise adaptation projects and transportation projects in the proposed plan, would include those described below. The following issues are addressed in various sections of Chapter 3, as noted:

- consumption of significant amounts of nonrenewable energy for construction, maintenance, and operation of new development, sea level rise adaptation projects, or transportation projects (addressed in Section 3.6, "Climate Change, Greenhouse Gases, and Energy");
- use of building materials, fossil fuels, and other resources for construction, maintenance, and operation of new development, sea level rise adaptation projects footprint, or transportation projects (addressed in Section 3.6, "Climate Change, Greenhouse Gases, and Energy");
- conversion of some resource lands, such as agricultural land, habitat areas, and other undeveloped lands into developed land, sea level rise adaptation projects footprint, or transportation uses (addressed in several sections, including Section 3.3, "Agriculture and Forestry Resources"; Section 3.6, "Climate Change, Greenhouse Gases, and Energy"; and Section 3.5, "Biological Resources");
- degradation of ambient air quality through the increase of harmful particulate matter caused by a cumulative increase in vehicle exhaust (addressed in Section 3.4, "Air Quality"); and
- emission of GHGs that would contribute to global climate change (addressed in Section 3.6, "Climate Change, Greenhouse Gases, and Energy").

5.2 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Significant and unavoidable impacts are those that cannot be mitigated to a less-than-significant level. Chapter 3 of this EIR identifies significant and unavoidable impacts of the proposed plan. As stated in Chapter 3, many impacts identified as significant could be reduced to a less-than-significant level, but only with adoption of mitigation measures that are outside the control of MTC and ABAG. These measures would be adopted by local jurisdictions as they approve proposed development. Because MTC and ABAG cannot require local implementing agencies to adopt most of the mitigation measures, and it is ultimately the responsibility of the local lead agency to determine and adopt mitigation, some impacts have been identified as significant and unavoidable for purposes of this program-level review. Projects taking advantage of CEQA Streamlining provisions of SB 375 (PRC Sections 21155.1, 21155.2, and 21159.28) must apply the mitigation measures described in this EIR, where applicable, to address site-specific conditions. The following are the impacts identified as significant and unavoidable, listed by technical section and impact number.

5.2.1 Aesthetics and Visual Resources

- Impact AES-1: Have a substantial adverse effect on a scenic vista
- Impact AES-2: Substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a State scenic highway

- Impact AES-3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings and in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality
- Impact AES-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area

5.2.2 Agriculture and Forestry Resources

- Impact AGF-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use, or conflict with existing zoning for agricultural use, or a Williamson Act contract
- Impact AGF-2: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])
- Impact AGF-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use

5.2.3 Air Quality

- Impact AQ-2: Result in a substantial net increase in construction-related emissions
- Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard
- Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations

5.2.4 Biological Resources

- Impact BIO-1a: Have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NOAA Fisheries
- Impact BIO-3: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites
- Impact BIO-5: Have the potential to substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species

5.2.5 Climate Change, Greenhouse Gases, and Energy

- Impact GHG-1: Result in a net increase in greenhouse gas emissions, either directly or indirectly, compared to existing conditions (2023 data) that may have a significant impact on the environment

- Impact GHG-3: Conflict with an applicable State plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases

5.2.6 Cultural Resources and Tribal Cultural Resources

- Impact CUL/TCR-1: Cause a substantial adverse change in the significance of a built-environment historical resource as defined in Guidelines Section 15064.5
- Impact CUL/TCR-2: Cause a substantial adverse change in the significance of a unique archaeological resource or a historical resource of an archaeological nature as defined in Guidelines Section 15064.5
- Impact CUL/TCR-4: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe

5.2.7 Geology, Seismicity, and Mineral Resources

- Impact GEO-7: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

5.2.8 Hazards and Wildfire

- Impact HAZ-4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment
- Impact HAZ-6: Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan
- Impact HAZ-7: Exacerbate the risk of wildland fires, associated pollutant release, and potential for flooding and landslides due to projected land use patterns and infrastructure in or near State Responsibility Areas or land classified as very high hazard severity zones

5.2.9 Land Use, Population, and Housing

- Impact LU-1: Physically divide an established community
- Impact LU-4: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere

5.2.10 Noise

- Impact NOISE-1: Generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

- Impact NOISE-2: Generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Impact NOISE-3: Generate excessive groundborne vibration or groundborne noise levels
- Impact NOISE-4: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels

5.2.11 Public Services and Recreation

- Impact PSR-1: Result in substantial adverse physical impacts associated with the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, and other public facilities
- Impact PSR-2: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment

5.2.12 Public Utilities and Facilities

- Impact PUF-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which could cause significant environmental effects
- Impact PUF-2: Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years
- Impact PUF-3: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments
- Impact PUF-4: Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals, and comply with federal, State, and local management and reduction statutes and regulations related to solid waste

5.2.13 Transportation

- Impact TRA-2: Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) pertaining to vehicle miles traveled

5.3 GROWTH-INDUCING IMPACTS

5.3.1 Growth-Inducing Impacts

CEQA Guidelines Section 15126.2(e) requires an EIR to evaluate the potential growth-inducing impacts of a proposed project. Specifically, an EIR must discuss the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth can be induced in a number of ways, including the elimination of obstacles to growth, or by encouraging and/or facilitating other activities that could induce growth. Examples of projects likely to have growth-inducing impacts include extensions or expansions of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential or commercial uses in areas that are currently only sparsely developed or are undeveloped.

The CEQA Guidelines are clear that while an analysis of growth-inducing effects is required, it should not be assumed that induced growth is detrimental or beneficial to the environment. The analysis below examines these issues relative to the adoption and implementation of the proposed plan.

PROJECT OVERVIEW

The proposed project is a long-range regional plan for the nine-county San Francisco Bay Area (Bay Area or region) that outlines 35 integrated strategies across four interrelated elements—transportation, housing, the economy, and the environment—to make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. The proposed plan serves as the fourth RTP/SCS for the Bay Area and is a limited and focused update to Plan Bay Area 2050. The proposed plan's strategies chart a course to make the Bay Area more affordable, connected, diverse, healthy, and vibrant for all residents, while also achieving regional GHG emissions reduction targets established by state and federal planning requirements, including the California Air Resources Board pursuant to SB 375.

The proposed plan includes transportation strategies to invest expected transportation revenues, housing and economic strategies to accommodate forecasted regional growth, and strategies to protect the environment, as well as protect the region from future sea level rise inundation.

The Bay Area consists of nine counties and 101 cities, covering an area of approximately 4.4 million acres. In 2020 the region had approximately 4.0 million jobs, 2.8 million households, and 7.7 million people (see **Table 2-15**). The proposed plan would accommodate projected growth for an additional 1.4 million jobs, 1 million households, and 1.8 million people from 2020 to 2050. The proposed plan provides a blueprint to accommodate regional growth in a manner that advances the state's climate goals and promotes public health and safety—by expanding transportation options, reducing GHG emissions, and supporting a mix of land uses.

ANALYSIS OF GROWTH-INDUCEMENT

This analysis examines the following potential growth-inducing impacts related to implementation of the proposed plan:

- foster population growth and construction of housing;
- eliminate obstacles to population growth;
- foster economic growth;

- affect service levels, facility capacity, or infrastructure demand; and
- encourage or facilitate other activities that could significantly affect the environment.

FOSTER POPULATION GROWTH AND CONSTRUCTION OF HOUSING

The proposed plan would accommodate the Bay Area's forecasted population through the identified land use, transportation, and environmental strategies. Overall, the region would move toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all, while also achieving the SB 375 State-mandated target for GHG emissions reductions. This is generally accomplished by select strategies' ability to shape the region's forecasted development pattern and focus new housing in Transit Rich Areas and High Resource Areas. The proposed plan's strategies are intended to help shape growth patterns in the region, leading to better efficiency, a more sustainable approach, and more compact and mixed patterns of land use that are better served by transit and other mode choice options.

Overall, the proposed plan accommodates the regional growth forecast in a manner that is more efficient and effective from a regional perspective, and consistent with SB 375. The proposed plan includes economic strategies as well, leveraging a set of geographies identified for intensified job site development and policies aimed at creating a more equitable economy. The proposed plan does not change local land use policies; individual jurisdictions retain local land use authority. However, the proposed plan reflects differences from local adopted land use plans in some areas, and may reflect greater density/intensity of growth than included in current adopted local general plans. Where this occurs, implementation would require the local jurisdiction to consider and resolve those differences through appropriate amendments to local planning documents and required environmental review.

While development consistent with the proposed plan would result in additional commerce, industry, recreation, public services, and infrastructure throughout the region, this economic activity is consistent with the housing and jobs growth forecasts. The number of housing units provided for in the proposed plan reflects the state requirement to provide housing for all economic segments of the population, as well as MTC and ABAG's legal settlement with the Building Industry Association requiring no net growth in the in-commute into the region. See the Plan Bay Area webpage, https://www.planbayarea.org, for more information. Therefore, because forecasted growth would be accommodated and managed, the proposed plan is not growth-inducing overall; rather, it reflects the regulatory mandate to provide housing for all economic segments of the forecasted population. While there may be differences with general plans at the local level, implementation of the proposed plan would require amendments to those local plans thus avoiding impacts related to unplanned growth and/or plan inconsistencies in smaller geographies.

Eliminate Obstacles to Population Growth

Impediments to growth may be physical, regulatory, or fiscal. A physical obstacle to growth typically involves the lack of public infrastructure or insufficient infrastructure capacity. The extension of public service infrastructure (e.g., roadways, water and sewer lines) into areas that are not currently provided with these services may be considered growth inducing. Similarly, the elimination of a regulatory obstacle, such as a service boundary or growth management policy, or a change in land use designation, can also result in new growth in a manner that might be considered growth inducing. In addition, resolution of infrastructure funding constraints or the identification of new sources of funding can facilitate growth by funding the construction of new infrastructure.

The proposed plan would result in substantial investments and improvements to the regional infrastructure in support of projected development. Transportation projects would create more efficient and effective circulation systems throughout the region. For the proposed plan, the transportation network is designed to support the land use strategies in a way that moves the region closer to the

attainment of the identified goals and objectives described above: a more efficient and equitable pattern that accommodates the forecasted growth.

The proposed plan includes a mix of land uses balanced to minimize vehicle miles traveled (VMT) and maximize the ability for residents to conduct everyday activities within their neighborhood without the need to travel by car. In other words, the roadway investments of the proposed plan are located and sized to achieve more sustainable forecasted growth. The proposed plan's transportation strategies detail how the region intends to invest the region's $512 billion in committed and forecasted transportation revenues over the next 25 years. The strategies were selected to move the region toward its adopted vision of a more affordable, connected, diverse, healthy, and vibrant Bay Area for all and to exceed the State-mandated target under the SB 375 process for GHG emissions reductions. This is generally accomplished by the strategies' ability to increase travel mode choices and accessibility while reducing travel times and costs. Transportation projects would include maintaining, enhancing, and expanding transportation networks to accommodate the housing, employment, and population forecasts for the region without inducing growth regionwide.

The proposed plan also includes investment to protect the region from 4.9 feet of future permanent sea level rise inundation, reduce climate emissions, and maintain and expand the region's parks and open space system. The sea level rise adaptation projects are located in areas where sea level rise threatens existing and locally projected development. This would generally protect existing developed areas from sea level rise hazards and would not create new areas of potential development.

In summary, the transportation investments of the proposed plan are located and sized to achieve more sustainable forecasted growth. The roadway capacity expansion would be limited, and transit capacity would be increased within the region to accommodate the forecasted growth. While obstacles to growth would be removed by providing more capacity in some instances, this growth is forecasted rather than induced. In addition, sea level rise adaptation projects have been planned to protect existing shoreline communities affected by sea level rise.

Foster Economic Growth

As discussed above, the proposed plan has been developed to accommodate forecasted future growth in population and employment opportunities, while providing a plan to build housing within the Bay Area consistent with the region's regional housing needs allocation requirements and SB 375. The proposed plan supports the successful economic growth and prosperity of the region as required by law. Federal regulations governing the preparation of regional transportation plans require that they "support the economic vitality of the metropolitan area" (23 CFR Section 450.306). Population growth resulting from that economic vitality is not driven by the proposed plan; thus, it is not a growth-inducing consequence of the proposed plan.

Affect Service Levels, Facility Capacity, or Infrastructure Demand

While development that may occur consistent with the proposed plan could result in increases in demand for public services and infrastructure in excess of the existing conditions, local agencies retain the authority to ensure the provision of appropriately timed and sized services and utilities to serve new urban development concurrent with growth. These impacts are addressed in Section 3.13, "Public Services and Recreation," and Section 3.14, "Public Utilities and Facilities," of this EIR.

Encourage or facilitate other activities that could significantly affect the environment

This EIR analyzes at a programmatic level the potential for implementation of the proposed plan's forecasted development pattern, sea level rise adaptation projects, and transportation projects to significantly affect the environment. These analyses are provided primarily in chapter 3.0 of this EIR. While

MTC and ABAG have planning authority to develop the policies and strategies in this plan, decisions regarding project construction occur through other lead agencies. The mitigation measures identified in this EIR would be implemented at the project level by those lead agencies, thus reducing the potential for significant effects to the maximum feasible level as determined by the approving agency. As noted above, the growth accommodated through the proposed plan is projected to occur based on identified demographic and economic forces. The proposed plan ensures that outcomes are more efficient and effective for the region overall.

Summary

In summary, the proposed plan includes 35 integrated strategies to enable the Bay Area to accommodate future growth and progress toward ensuring the Bay Area is affordable, connected, diverse, healthy and vibrant for all. This growth is not under the authority or control of MTC or ABAG. As dictated by existing State law, it will occur in a manner substantially consistent with local general plans and other applicable requirements.

The proposed plan accounts for growth likely to occur through 2050 and makes assumptions about location and design that promote regional environmental benefits. The proposed plan's housing needs forecast accounts for growth for all economic segments of the population and assumes no net increase in the in-commute from outside the region as required by SB 375. While the effects of growth inducement can be considered an adverse impact under CEQA, the proposed plan accommodates projected growth and implements State mandates to integrate land use and transportation decision-making in a way that achieves improved environmental and social outcomes. As discussed above, the proposed plan would be growth-accommodating, not growth-inducing, and it reflects the regulatory mandate to house the forecasted population. At the regional and Statewide level, the proposed plan's policies help prevent sprawl and make growth in existing centers more equitable and more efficient. Under the proposed plan, GHG emissions and other environmental impacts would be lessened relative to what may otherwise occur absent of the regional strategies embodied in the proposed plan.

5.4 CUMULATIVE IMPACTS

The CEQA Guidelines define cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (Section 15355). Section 15130 of the CEQA Guidelines requires that an EIR evaluates potential environmental impacts that are individually limited but cumulatively considerable. These impacts can result from the proposed project alone or together with other projects. The CEQA Guidelines state: "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects" (Section 15355). A cumulative impact of concern under CEQA occurs when the net result of combined individual impacts compounds or increases other overall environmental impacts (CEQA Guidelines Section 15355). In other words, cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. CEQA does not require an analysis of incremental effects that are not cumulatively considerable, nor is there a requirement to discuss impacts that do not result in part from the project evaluated in the EIR.

5.4.1 Methodology

The proposed plan is a cumulative plan by design. The plan area encompasses 4.4 million acres and includes nine counties and 101 cities. It integrates transportation investments with land use strategies for an entire

region of the State that shares, or is connected by, common economic, social, and environmental characteristics. Therefore, the environmental analysis of the proposed plan presented throughout this EIR is a cumulative analysis compliant with the requirements of CEQA and the CEQA Guidelines. Furthermore, this EIR contains detailed analysis of regional (cumulative) impacts, which are differentiated from localized impacts that may occur at the county and/or priority development area level. Nevertheless, the following discussion examines impacts associated with implementation of the proposed plan, plus implementation of projected development for jurisdictions adjoining the Bay Area, to assess the potential for cumulative impacts from growth extending beyond the region.

CEQA allows the cumulative impact analysis to use either a list of past, present, and probable future projects, including projects outside the control of the lead agency, or a summary of projections in an adopted planning document, or a thoughtful combination of the two approaches. The cumulative analysis presented below uses a projection-based approach. Land use and growth projections for the region, which are the subject of analysis throughout this EIR, are combined with the growth projections for the adjoining counties. Adjoining counties are listed as follows:

- Lake County: Lake County is located generally to the north of the plan area, north of Napa County, and northeast of Sonoma County. It is sparsely populated, with the majority of development surrounding Clear Lake. According to the Lake County General Plan, the county is rooted in agriculture, resort development, and rural mountain communities (Lake County 2008).
- Mendocino County: Mendocino County is located to the north of the plan area, north of Sonoma County, and west of Lake County. It has a history of timber and agricultural production. This county is facing increased development pressures from its more urban neighboring counties and changes in the timber and agricultural industries (Mendocino County 2009).
- Merced County: Merced County is located in the heart of California's San Joaquin Valley, a very productive agricultural region. The county, which extends from the Coast Range to the foothills of the Sierra Nevada, is bordered by Santa Clara County to the west (Merced County 2013). It is generally southeast of the plan area.
- Sacramento County: Sacramento County is located east of the plan area, bordering Solano County to the east and Contra Costa to the north. This county has a large population (nearly 1.5 million people), centered around seven incorporated cities (Sacramento County 2022).
- San Benito County: San Benito County is located south of the plan area, bordering Santa Clara County to the south. San Benito County is generally rural and contains substantial amounts of agricultural land (San Benito County 2015).
- San Joaquin County: San Joaquin County is located in the Central Valley of California, east of the plan area. It borders Contra Costa and Alameda Counties to the east. San Joaquin County is primarily in agricultural production and contains a large population centered primarily around its seven cities (San Joaquin County 2016).
- Santa Cruz County: Santa Cruz County is located south of the plan area, bordering the western edge of Santa Clara County and south of San Mateo County. The dominant economic activities in Santa Cruz County are centered in agricultural and food processing within South County, in educational, governmental, and health care services; and in tourism within North County. Other economic activities include quarrying, forestry, wood products, fishing, and other manufacturing. The urbanized portion of unincorporated areas in Santa Clara County have a higher population than the city of Santa Cruz (Santa Cruz County 2024).
- Stanislaus County: Stanislaus County is located east of the plan area, bordering the eastern edge of Santa Clara County. This county is located in the San Joaquin Valley. Stanislaus County is primarily in

agricultural production but is facing rapid population growth that began in the 1990s (Stanislaus County 2015).

- Yolo County: Yolo County was one of the original 27 counties created when California became a state in 1850. The county is located in the rich agricultural regions of California's Central Valley and the Sacramento River Delta. It is directly west of Sacramento, the State capital, and northeast of the Bay Area counties of Solano and Napa (County of Yolo 2009).

The area that includes the Bay Area and the above-referenced adjoining counties is referred to in this analysis as the "cumulative impact analysis area." While this analysis considers the growth projections of each adjoining county, each jurisdiction uses its own methodology and horizon year for growth projections, resulting in inconsistent data across the cumulative impact analysis area. For example, the existing Mendocino County General Plan and Merced County General Plan established 2030 as the planning horizon while the San Benito County General Plan established a horizon year of 2035. This patchwork of horizons and assumptions makes it difficult to combine general plan projections into a coherent 2050 forecast. Because the California Department of Finance (DOF) uses a consistent method for growth projections across all jurisdictions in California and provides the same projection horizon for all counties in the state, DOF provides the best available information to establish the cumulative baseline for the EIR. Therefore, the population projections from DOF (Table 5-1) are used for the cumulation analysis. As shown in **Table 5-1**, the population for the cumulative impact analysis area is projected to grow from under 12 million people in 2020 to over 14 million people by 2050.

As shown in **Table 5-1**, over 66% of the existing population in the cumulative impact analysis area is located in the plan area. By 2050, this proportion is expected to increase slightly (67% of the population). Thus, under both current and forecasted future conditions, the Bay Area represents a substantial portion of the growth in the cumulative analysis impact area. This is considered in the discussion below.

Table 5-1 Population Projections of Cumulative Impact Analysis Area, 2020–2050

Jurisdiction	Acreage	Population	
		Base Year 2020	2050
Lake County	851,000	67,800	58,200
Mendocino County	2,045,000	91,300	94,900
Merced County	1,266,000	281,200	331,400
Sacramento County	636,000	1,586,000	1,921,000
San Benito County	889,000	64,300	80,100
San Joaquin County	913,000	779,700	1,029,000
Santa Cruz County	286,000	271,600	270,500
Stanislaus County	970,000	553,100	608,600
Yolo County	653,000	218,300	288,700
Bay Area	4,400,000	7,749,000	9,586,000
Total	12,909,000	11,662,000	14,268,000

Notes: Whole numbers have been rounded (between 1,000 and 1,000,000 to the nearest 100, above 1,000,000 to the nearest 1,000). Figures may not sum because of independent rounding.

Sources: California Department of Finance 2025; data provided by MTC and ABAG in 2025; compiled by Ascent in 2025.

CUMULATIVE EFFECTS OF THE PROPOSED PLAN

The following analysis examines the cumulative effects of the proposed plan within the cumulative analysis impact area. The potential cumulative effects of the proposed plan are summarized qualitatively below for each of the topics analyzed in Chapter 3 of this EIR.

Aesthetics and Visual Resources

Aesthetics and visual resources impacts associated with implementation of the proposed plan are analyzed in Section 3.2 of this EIR. The analysis examines impacts of the proposed plan on aesthetics and visual resources throughout the Bay Area. Some impacts on scenic viewsheds would be expected, but these viewsheds are within the Bay Area and not visible to areas surrounding the plan area. Generally, effects on scenic resources occur at the interface between development and the scenic resources and tend to be localized. Consequently, the proposed plan would not be expected to combine with development in adjacent areas to produce a considerable contribution to cumulative impacts. The potential for cumulative impacts related to aesthetics and visual resources would not be cumulatively considerable, and the impact would be less than significant (LTS).

Impact CUM-1: The incremental contribution to cumulative aesthetics and visual resources impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Agriculture and Forestry Resources

Implementation of the proposed plan has the potential to result in conversion of land uses, including the conversion of agricultural lands and forestland to urban uses, as discussed in Section 3.3 of this EIR. Similarly, development pursuant to other local and regional planning efforts within the cumulative impact analysis area could also have impacts on agriculturally designated land and forestry resources. As a result, cumulative impacts would be potentially significant. Further, implementation of the proposed plan and other cumulative development could also indirectly result in additional conversion of agriculture land and forestland to other uses. Because of the potential direct and indirect impacts that could occur as a result of the proposed plan, implementation of the proposed plan would contribute considerably to this impact and the impact would be significant (S).

Impact CUM-2: The incremental contribution to cumulative agricultural and forestry resources impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-2: Implement Mitigation Measures in Section 3.3.

Implementing these mitigation measures would reduce the significant impact of conversion of agricultural land and forestland to other uses because it would require avoidance or compensation for converted lands. However, conservation easements do not offset the loss of agricultural land and forestland converted to other uses. While implementing these mitigation measures would protect other agricultural land and forestland in the future, it would not avoid conversion or restore new land to equivalent value to that lost. For these reasons, the residual impacts on conversion of agricultural land and forestland would be significant and unavoidable (SU). Additionally, the cumulative impact on agriculture and forestry resources would be significant and unavoidable (SU).

Air Quality

As noted in Section 3.4, the nine-county MTC region encompasses all or parts of three air basins (the San Francisco Bay Area Air Basin in its entirety, portions of the North Coast Air Basin, and portions of the Sacramento Valley Air Basin), and it falls within the jurisdiction of the three related air districts (Bay Area Air District, North Sonoma County Air Pollution Control District, and Yolo-Solano Air Quality Management District). Outside of the MTC region, three additional air basins are located in the other nine additional counties in the cumulative impact analysis area:

- Lake County Air Basin,
- San Joaquin Valley Air Basin, and
- North Central Coast Air Basin.

Additionally, portions of the cumulative impact analysis area (outside of the plan area) fall within the jurisdiction of the following five additional air districts:

- Lake County Air Quality Management District – Lake County;
- Mendocino County Air Quality Management District – Mendocino County;
- Monterey Bay Unified Air Pollution Control District – San Benito County;
- Sacramento Metropolitan Air Quality Management District – Sacramento County; and
- San Joaquin Valley Air Pollution Control District – Merced, San Joaquin, and Stanislaus Counties.

The State has identified air basin–specific pollutants that have exceeded applicable federal and State pollutant standards. As noted in Section 3.4, any area that exceeds applicable standards for a particular pollutant is typically referred to as a "nonattainment" area for that pollutant. In addition, the air districts identified above have prepared area-specific air quality plans to improve air quality conditions within their jurisdiction to meet federal and state pollutant standards for those pollutants that currently exceed standards. Although each jurisdiction is primarily responsible for regulating its own emissions, pollutant transport, which is a result of a variety of topographical and atmospheric conditions that cause pollution generated in one location to move to another location (including a neighboring air basin), can result in one area's emissions affecting another's ability to achieve applicable pollutant standards.

Because the air basins identified above are currently designated as nonattainment areas for one or more pollutants for which federal and/or State standards exist, a significant cumulative impact exists. Additionally, the proposed plan could result in substantial increases in pollutant emission levels (PM_{10} and $PM_{2.5}$) during construction and operational activities associated with future growth and development patterns. However, the proposed plan is intended to reduce the overall emissions load through a transportation and land use strategy that maximizes access to transit and other alternative transportation approaches, lowering potential VMT per capita. While an improvement over what would be expected absent the plan, given existing air pollution conditions in surrounding areas, implementation of the proposed plan would be cumulatively considerable and significant (S).

Impact CUM-3: The incremental contribution to cumulative air quality impacts, from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-3: Implement Mitigation Measures in Section 3.4.

As noted in Section 3.4, mitigation measures are available that could reduce an individual project's contribution (under the proposed plan) to areawide emissions. However, the ability and requirement to implement such measures would ultimately be the responsibility of a lead agency to determine on a case-by-

case basis, and implementation cannot be guaranteed by MTC or ABAG. As a result, the cumulative impact on air quality would be significant and unavoidable (SU).

Biological Resources

The effect of implementation of the proposed plan on regional biological resources is analyzed in Section 3.5 of this EIR. Biological resources impacts include direct and indirect effects on sensitive/special-status species or their habitat; substantial adverse effects on riparian, wetland, or other sensitive natural communities; interference with wildlife movement/corridors and nursery sites; or conflicts with plans or policies protecting biological resources. As noted in Section 3.5, implementation of the forecasted development pattern under the proposed plan could result in regional impacts on special-status species. Similarly, development pursuant to other local and regional planning efforts within the cumulative impact analysis area could also have impacts on special-status species and habitat. As a result, cumulative impacts would be potentially significant. Further, implementation of the proposed plan and other cumulative development could also result in disruption of movement corridors and nursery sites. Because of the potential direct and indirect impacts, including loss of individual species and habitat that may occur as a result of the proposed plan, implementation of the proposed plan would contribute considerably to this impact, and this impact would be significant (S).

CUM-4: The incremental contribution to cumulative biological resources impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-4: Implement Mitigation Measures in Section 3.5.

These mitigation measures set requirements for surveys and actions to be taken if biological resources may be adversely affected. If the implementing agency and/or project sponsor adopts these mitigation measures, it would reduce the contribution of the proposed plan to cumulative impacts on biological resources. However, the mitigation measures may not be sufficient to reduce impacts to a less-than-significant level in all cases. Additionally, MTC and ABAG cannot require implementing agencies to adopt these mitigation measures. It is ultimately the responsibility of the implementing agency to determine and adopt mitigation. Therefore, the cumulative impact on biological resources would be significant and unavoidable (SU).

Climate Change, Greenhouse Gases, and Energy

Section 3.6 in this EIR addresses climate change, GHG emissions, and energy. Implementation of the proposed plan would result in the densification of land use, increased energy efficiency from residential uses, and a net reduction in the consumption of automotive fuel and would increase reliance on renewable energy sources. Development associated with the proposed plan is not expected to combine with development in adjacent areas to produce a considerable contribution to cumulative energy impacts. Climate change is an inherently cumulative issue. MTC and ABAG have developed a land use and transportation strategy that meets SB 375 goals and places the Bay Area on a downward trajectory in GHG emissions, but the California Air Resources Board has stated that meeting SB 375 goals alone will not meet statewide goals under California's 2022 Climate Change Scoping Plan. The proposed plan does not have additional land use strategies to feasibly bridge the gap between the proposed plan GHG emissions and the statewide 2030 and 2045 targets. This is not unique to MTC; all metropolitan planning organizations (MPOs) in California are faced with this same challenge. In the absence of State and local jurisdictional action (e.g., new State regulations, city and county GHG reduction plans targeted to 2030 and 2045), it is not possible to demonstrate that the proposed plan would not impede the State's ability to achieve its SB 32 and AB 1279 GHG reduction targets. Thus, implementation of the proposed plan would contribute considerably to this impact and would be significant (S). *Impact CUM-5: The incremental contribution to cumulative climate*

change and GHG impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-5: Implement Mitigation Measures in Section 3.6.

Implementing these mitigation measures would reduce the potentially significant impact related to a conflict with statewide GHG emissions reduction goals linked to transportation because it would require climate action planning, which would help to reduce GHG emissions from the projected land use growth footprint that would be constructed under the plan, as well as reduce GHG emissions from existing uses. Mitigation, via climate action plans for individual jurisdictions, or other programs, including retrofitting existing buildings, installing renewable energy facilities that replace reliance on fossil-fuel power in the region, altering the vehicle fleet (toward more non-fossil fuel-powered vehicles), and implementing other measures would be required to meet the goals needed for the State to attain the 2030 and 2045 targets. However, there is no assurance that the measures would reduce impacts to a less-than-significant level. Additionally, the ability and requirement to implement such measures would ultimately be the responsibility of the local jurisdiction, and implementation cannot be guaranteed by MTC or ABAG, resulting in a cumulatively considerable contribution by the proposed plan. Therefore, the cumulative impact on climate change and GHG emissions would be significant and unavoidable (SU).

Cultural Resources and Tribal Cultural Resources

The effect of implementation of the proposed plan on cultural resources and tribal cultural resources (TCRs) is analyzed in Section 3.7 of this EIR. While some cultural resources may have regional significance, the resources themselves are site specific, and impacts on them are project specific. For example, impacts on a subsurface archaeological find at one project site are generally not made worse by impacts from another project on a cultural resource at another site. Rather, the resources and the effects on them are generally independent. Therefore, the proposed plan would not be expected to combine with impacts on cultural resources in areas surrounding the Bay Area to create more considerable impacts. The potential for cumulative impacts related to cultural resources is not cumulatively considerable, and the impact would be less than significant (LTS).

However, with regard to TCRs, the aerial extent of ancestral territories for affected tribes may be extensive. Sacred Lands searches would be conducted through the Native American Heritage Commission during the CEQA process, and local jurisdictions in the region must initiate consultation with the Native American tribes as part of their compliance with Assembly Bill 52. The purpose of that consultation is to determine whether there is a potential for TCRs that could be affected by a proposed project and to engage the tribes in addressing the impacts on a project level. Ongoing consultation with tribes has identified, and would continue to identify, additional TCRs throughout the region. However, on a regional level, the loss of these resources may not be mitigated to acceptable levels through data recovery and collection, because their value may also lie in tribal cultural mores and religious beliefs. Therefore, cumulative disturbance of TCRs from plan implementation within the historic boundaries of tribes in the Bay Area and surrounding counties, in particular disturbance of TCRS associated with the cultural and physical remains of native peoples whose descendants are living today, could contribute considerably to this impact and would be a significant impact (S).

CUM-6: The incremental contribution to cumulative tribal cultural resources impacts would be cumulatively considerable and would be significant (S).

Mitigation Measure

CUM-6: Implement Mitigation Measure CUL/TCR-4.

Implementation of Mitigation Measures CUL/TCR-4(a) and CUL/TCR-4(b) would reduce impacts associated with TCRs because it would require the performance of professionally accepted and legally compliant procedures related to the identification of TCRs associated with subsequent projects. However, the ability and requirement to implement such measures would ultimately be the responsibility of a lead agency to determine on a case-by-case basis, and implementation cannot be guaranteed by MTC or ABAG. As a result, this cumulative impact on cultural resources and TCRs would be significant and unavoidable (SU).

Geology, Seismicity, and Mineral Resources

Impacts on geology, seismicity, and mineral resources related to implementation of the proposed plan are analyzed in Section 3.8 of this EIR. Geology, seismicity, and mineral resources impacts may result from increased exposure to seismic hazards, increased erosion and/or loss of topsoil, the presence of unstable/expansive soils, alternative waste disposal or septic systems, and the loss of known mineral resources or paleontological resources. These effects occur independently of one another, related to site-specific and project-specific characteristics and conditions. In addition, existing regulations specify mandatory actions that must occur during project development, which would adequately address the potential for effects from construction or operation of projects related to geology, seismicity, and paleontological and mineral resources as noted throughout the impact discussion in Section 3.8 of this EIR.

The potential for cumulative impacts related to geology, seismicity, and paleontological and mineral resources is not cumulatively considerable, and the impact would be less than significant (LTS).

CUM-7: The incremental contribution to cumulative geology, seismicity, and mineral resources impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Hazards and Wildfire

Impacts associated with hazards and wildfire related to implementation of the proposed plan are analyzed in Section 3.9 of this EIR. Hazards and hazardous materials impacts may be related to the transport, use, or disposal of hazardous materials (including by rail); reasonably foreseeable upset or accidental conditions involving the release of hazardous materials; emission of hazardous materials within ¼-mile of a school; location on a known hazardous materials site; and airport-related hazards. Most of these effects occur independently of one another, related to site-specific and project-specific characteristics and conditions. In addition, the proposed plan would not generate a substantial increase in hazardous materials transport by rail. Furthermore, existing regulations specify mandatory actions that must occur during project development, including transport, use, and disposal of hazardous materials, which would adequately address issues pertaining to hazards and hazardous materials as noted throughout the impact discussion in Section 3.9 of this EIR. The potential for cumulative impacts related to hazards and hazardous materials is not cumulatively considerable, and the impact would be less than significant (LTS).

Hazards related to implementation of an adopted emergency response plan or emergency evacuation plan would be potentially significant because increased population and employment in areas in the Bay Area would increase congestion on evacuation routes and could slow evacuation. The potential for cumulative impacts related to evacuation would be cumulatively considerable, and the impact would be significant (S). Features of the plan that would reduce the potential to exacerbate the risk of wildfire include maintaining the urban growth boundaries, directing growth away from areas with the highest fire hazard severity potential, and supporting vegetation management on conservation lands. The proposed plan is

designed to accommodate anticipated population growth in a manner that reduces potential contributions to climate change, encourages concentrated growth in developed areas and land management in open space, and includes structural hardening efforts where existing structures are vulnerable to fire. Nonetheless, because development could occur near land classified as very high hazard severity zones and could indirectly result in extension or expansion of infrastructure through these areas, there is potential for the proposed plan to exacerbate the risk of wildland fires. The plan could indirectly result in extension or expansion of infrastructure through these areas and adversely affect emergency evacuation procedures. This impact would be potentially significant. Because the risk and effects of wildland fires are regional in nature, the potential direct and indirect impacts that could occur as a result of the proposed plan would contribute considerably to this impact and would be significant (S).

CUM-8: The incremental contribution to cumulative hazards and wildfire impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-8: Implement Mitigation Measures in Section 3.9.

As noted in Section 3.9, mitigation measures are available that could reduce an individual project's contribution (under the proposed plan) to inadequate emergency access and wildland fire risk. However, the ability and requirement to implement such measures would ultimately be the responsibility of a lead agency to determine on a case-by-case basis, and implementation cannot be guaranteed by MTC or ABAG. As a result, this cumulative impact on hazards and wildfire would be significant and unavoidable (SU).

Hydrology and Water Quality

Hydrology and water quality impacts associated with implementation of the proposed plan are analyzed in Section 3.10 of this EIR. These impacts may be related to violation of water quality standards; interference with groundwater recharge; increased erosion; increased nonpoint source pollution; increased runoff; effects on flood zones; and exposure of people to a significant risk of loss, injury, or death involving flooding (including flooding as a result of the failure of a levee or dam), seiche, tsunami, or mudflow. These effects, like those related to geology, seismicity, and mineral resources above, occur independently of one another, related to site-specific and project-specific characteristics and conditions. In addition, existing regulations specify mandatory actions that must occur during project development, which would adequately address the potential for construction or operation of projects to affect water resources as noted throughout the impact discussion in Section 3.10. Thus, the potential for cumulative impacts related to water resources is not cumulatively considerable, and the impact would be less than significant (LTS).

CUM-9: The incremental contribution to cumulative hydrology and water resources impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Land Use, Population, and Housing

Land use, population, and housing impacts associated with implementation of the proposed plan are analyzed in Section 3.11 of this EIR. As noted in Section 3.11, the additional population, housing, and job growth forecasted for the planning period is not a result of the proposed plan; rather, the growth is forecast to occur with or without the proposed plan. The proposed plan provides a strategy to accommodate growth in such a way as to achieve a more balanced jobs-housing ratio and to optimize transportation investments that support those land uses. The land use growth footprint assumes a number of residential units adequate to meet the forecasted demand, taking into account localized displacement of some

households within the region. Therefore, implementation of the proposed plan would not result in displacement at the regional scale, and localized displacement would not be expected to exert development pressure on areas surrounding the Bay Area. Because the proposed plan would not exert development pressure on adjacent counties through displacement of land uses, indirect effects that would otherwise be expected (effects tied to development) would not occur. This would be a less-than-significant cumulative effect (LTS).

CUM-10: The incremental contribution to cumulative land use, population, and housing impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Noise

Impacts associated with noise related to implementation of the proposed plan are analyzed in Section 3.12 of this EIR. Noise impacts are based on factors related to site-specific and project-specific characteristics and conditions, including distance to noise sources, barriers between land uses and noise sources, and other factors. Impacts related to construction, traffic, and transit would be significant. Cumulative noise increases from traffic within the plan area are addressed in Section 3.12. No other cumulative sources of noise (in relation to cumulative development) are expected.

The proposed plan is not expected to substantially increase interregional travel, because the proposed plan accommodates projected growth. Therefore, proposed plan-related contributions to traffic noise outside the region are expected to be minimal, and the proposed plan's contribution to cumulative traffic noise would be less than significant (LTS).

CUM-11: The incremental contribution to cumulative noise impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Public Services and Recreation

Impacts on public services and recreation related to implementation of the proposed plan are analyzed in Section 3.13 of this EIR. This assessment includes an analysis of the need for new facilities or modification to facilities, the construction of which causes significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for schools, emergency services, police protection, fire protection, and other public facilities or for regional parks or other recreational facilities.

Law enforcement, fire protection, and emergency services are provided by local governments or fire protection districts for areas within their jurisdiction, although mutual-aid agreements between agencies help spread and share resources. The California Highway Patrol has specific jurisdiction over all California State routes (including all freeways and expressways), US highways, interstate highways, and all public roads in unincorporated parts of a county. The US Forest Service and California Department of Forestry and Fire Protection provide fire protection services within many rural areas.

Public schools are provided by school districts to areas within their jurisdictions. While districts may have cross-jurisdictional boundaries, school services are still provided at the local, rather than regional, level. Libraries are also generally provided by local governments for areas within their jurisdiction, and services

are not provided on a regional basis, although there are often regional cooperation programs. Social services are generally provided by counties and not provided on a regional basis.

Neighborhood and city/county parks and recreational services are provided by local governments for areas within their jurisdiction. The Bay Area also includes numerous regional, state, and federal parks, open space, and recreational areas.

The effects of the proposed plan as it relates to most public services and local parks and recreation facilities would not be cumulatively considerable, because of the localized (and inherently noncumulative) nature of these services. As a result, cumulative impacts related to these services would be less than significant (LTS).

Impact CUM-12: The incremental contribution to cumulative public services and recreation impacts from implementation of the proposed plan would not be cumulatively considerable. This impact would be less than significant (LTS).

Mitigation Measure

None required.

Public Utilities and Facilities

Impacts on public utilities and services related to implementation of the proposed plan are analyzed in Section 3.14 of this EIR. The analysis includes an examination of potential impacts related to the availability and capacity of water supply, stormwater, wastewater, solid waste, natural gas, propane, electricity, and telecommunications infrastructure. The utilities identified below are generally provided or delivered on a local level but may originate from sources outside of the local jurisdiction and/or as part of a regional distribution system. The proposed plan's contribution to cumulative impacts associated with the provision of utilities is discussed below.

Water Supply and Infrastructure

Water supply and associated infrastructure have both local and regional aspects. The rivers that provide virtually all the surface water supplies in the Bay Area originate outside the region and travel through the region and beyond, providing water supply to jurisdictions inside and outside of the Bay Area along the way.

An increase in demand and water consumption in one region has the potential to affect supplies throughout California, because the surface water supply systems are interconnected. Development of future water supply and associated infrastructure regionally and beyond depends on several factors, such as surface water and groundwater availability, groundwater recharge, land use density, and land use type. Future urban growth (population, housing, and employees) anticipated with implementation of the plan would result in an increase in water supply needs and demand. Future growth elsewhere in the cumulative impact analysis area could also lead to potential future water shortages and depletion of existing water supplies. As a result, the proposed plan's contribution with respect to water supply and water infrastructure would be cumulatively considerable, and this impact would be potentially significant (PS).

Wastewater and Infrastructure

Wastewater service (sewer treatment) is a localized concern because the wastewater treatment facilities and services are usually provided and regulated by local governments or special districts for areas within their jurisdiction. For this reason, wastewater systems and associated infrastructure within the Bay Area would not be substantially affected by development outside of the region or substantially affect other counties in the cumulative impact analysis area. Therefore, the proposed plan's contribution with respect

to wastewater and wastewater infrastructure would not be cumulatively considerable, and impacts would be less than significant (LTS).

Stormwater and Infrastructure

Stormwater drainage systems in the Bay Area are generally provided by local governments for areas within their jurisdictions or for county/city areas combined and are not typically provided on a regional or extra-regional basis. Stormwater drainage solutions typically depend on site-specific and project-specific characteristics and implementation. For this reason, stormwater drainage systems within the plan area would not be significantly affected by development outside of the region, nor would development under the proposed plan significantly affect stormwater drainage systems in the cumulative impact analysis area. Therefore, the proposed plan's contribution with respect to stormwater and stormwater infrastructure would not be cumulatively considerable, and impacts would be less than significant (LTS).

Solid Waste

Solid waste management is generally provided by privately operated landfills (with the exception of one landfill operated by the Sonoma County Public Works Department) under the oversight of each county's local enforcement agency and not on a regional basis. There are 56 transfer stations in the Bay Area that receive solid waste and transfer it into containers or vehicles before it is finally disposed of in a landfill or transformation facility, and solid waste generated in one county can be transported to another county or outside the region. Implementation of the proposed plan, in conjunction with other development projected to occur in the cumulative impact analysis area, has the potential to exceed available local solid waste capacity. Because of the potential solid waste generated through plan implementation, the proposed plan's contribution would be cumulatively considerable. Impacts would be significant (S).

CUM-13: The incremental contribution to cumulative public utilities and facilities impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).

Mitigation Measure

CUM-13: Implement Mitigation Measures in Section 3.14.

The mitigation measures identified in Section 3.14 would ensure that adequate public utilities would be available to serve the project at applicable service levels. If the implementing agency and/or project sponsor adopts these mitigation measures, it would reduce the cumulative contribution of the proposed plan to less than considerable, and residual impacts on public utilities and facilities would be less than significant (LTS). However, the ability and requirement to implement such measures would ultimately be the responsibility of the local jurisdiction, and implementation cannot be guaranteed by MTC or ABAG, resulting in a cumulatively considerable contribution by the proposed plan. Therefore, the cumulative impact on public utilities and facilities would be significant and unavoidable (SU).

Transportation

Impacts on transportation related to implementation of the proposed plan are analyzed in Section 3.15 of this EIR. As discussed in Section 3.15, implementation of the proposed plan would reduce per-capita VMT compared to the 2023 baseline but would increase total regional VMT because of the projected population increase. If implemented, the proposed plan's comprehensive suite of land use, transportation, and environmental strategies would help the region make progress in reducing per-capita VMT and would not directly interfere with statewide VMT reduction policies intended to meet the State's statutory GHG emission targets. However, because there is a gap between SB 375 targets and GHG emissions reduction needed to achieve statewide GHG emissions reduction goals, and because the ability to bridge this gap relies on implementation of travel demand management and other strategies that can be employed only

at the local jurisdictional level, MTC and ABAG cannot conclude that the reductions would be sufficient to meet the State's climate goals. The inability to meet this goal is not limited to MTC or the proposed plan; rather, it affects all MPOs and the entire State. Thus, the proposed plan would contribute considerably to this impact and would be significant (S). The less-than-significant impacts related to conflicts with a program, plan, ordinance, or policy addressing the circulation system; increased hazards related to geometric design features or incompatible uses; and emergency access would be localized. Consequently, the proposed plan would not be expected to combine with development in adjacent areas to produce a considerable contribution to cumulative impacts. The potential for cumulative impacts related to conflicts with existing programs and plans, increased hazards, and emergency access would not be cumulatively considerable, and these impacts would be less than significant (LTS).

Impact CUM-14: *The incremental contribution to transportation impacts from implementation of the proposed plan would be cumulatively considerable. This impact would be significant (S).*

Mitigation Measure

CUM-14: Implement Mitigation Measures in Section 3.6.

These mitigation measures would reduce the significant impact of meeting State's GHG emissions reduction goals linked to transportation because they would involve implementing additional State policy actions and funding to close the VMT gap between what the MPOs could achieve through implementation of their SCSs, and reductions needed to meet State's goals. However, there is no assurance that implementation of the mitigation measures would be enough to achieve the regional reductions needed to attain the State's goals. Additionally, the ability and requirement to implement such measures would ultimately be the responsibility of the local jurisdiction, and implementation cannot be guaranteed by MTC or ABAG, resulting in a cumulatively considerable contribution by the proposed plan. Therefore, the cumulative impact on transportation would be significant and unavoidable (SU).

5.5 IMPACTS FOUND NOT TO BE SIGNIFICANT

This EIR focuses on potentially significant impacts. CEQA requires that an EIR provides a brief statement indicating why various possible significant impacts were determined to not be significant and were not discussed in detail. For the issue areas addressed in Chapter 3, all potential impacts are identified. See Sections 3.2 through 3.15 for discussions related to impacts found not to be significant.

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6 EIR PREPARERS

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Appendix A

Notice of Preparation

METROPOLITAN TRANSPORTATION COMMISSION
ASSOCIATION OF BAY AREA GOVERNMENTS

PLAN BAY AREA 2050+

NOTICE OF PREPARATION (NOP)

To:	Interested Agencies, Organizations and Individuals
Project:	**Draft Environmental Impact Report for Plan Bay Area 2050+** ***(Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area)***
Lead Agencies:	Metropolitan Transportation Commission/Association of Bay Area Governments
Comment Period:	January 14, 2025 – February 13, 2025 (30 days)

Interested agencies, organizations and individuals are invited by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) to comment on the scope and content of the environmental impact assessment that will be conducted for the long-range regional plan for transportation, housing, the economy and the environment known as *Plan Bay Area 2050+*. A map of the nine-county area addressed in the plan is included in this notice as Figure 1.

MTC and ABAG are the joint lead agencies undertaking preparation of a program-level Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050+. Plan Bay Area 2050+ is designed to serve as the 2025 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the San Francisco Bay Area. In addition to the focus on transportation and land use, Plan Bay Area 2050+ incorporates economic and environmental issues into the plan; taken as a package, the plan identifies a suite of integrated strategies that will enable the Bay Area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges. The plan also identifies regional transportation planning needs, priorities and funding, and allows project sponsors to qualify for federal funding for public transit, streets and roads, and bicycle and pedestrian facilities. Although not required by law, the plan further identifies needs and revenues for affordable housing, environmental resilience, and economic development as a best practice.

Plan Bay Area 2050+ seeks to ensure that the Bay Area is more affordable, connected, diverse, healthy, and vibrant for all by the year 2050. It also seeks to meet or exceed state and federal planning requirements, including a state-mandated year 2035 target for greenhouse gas emissions reduction. The plan is required to be updated every four years. Attachment A to this NOP provides more information on MTC, ABAG, SB 375 and Plan Bay Area 2050+.

In accordance with the California Environmental Quality Act (CEQA) Guidelines (Section 15082), the purpose of this Notice of Preparation is to seek comments about the scope and content of the environmental impact report that will be prepared for Plan Bay Area 2050+. EIRs are prepared to inform decision makers and the public about the potential physical environmental impacts associated with changes to the environment that may result if a project is approved. If you represent an agency that may rely upon the EIR for project approval and/or tiering, MTC and ABAG are particularly interested in what information may be helpful for these purposes. Input is also sought from organizations and individuals as to the issues that should be addressed in the EIR.



FIGURE 1. NINE-COUNTY SAN FRANCISCO BAY AREA

Adoption and implementation of Plan Bay Area 2050+ has the potential to result in environmental effects in all the environmental impact areas identified in CEQA. For this reason, the Plan Bay Area 2050+ EIR will be a "full scope" document and will analyze all the required CEQA environmental issue areas. These include: aesthetics; agriculture and forestry resources; air quality; biological resources; cultural resources; energy; geology and soils; greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality; land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation/traffic; tribal cultural resources; utilities and other service systems; and wildfire. The EIR will also address cumulative effects, growth inducing impacts and other issues required by CEQA.

MTC and ABAG would be particularly interested in hearing your views on the following questions:

1. Are there any alternatives you believe MTC/ABAG should evaluate?
2. What types of mitigation measures do you think would help avoid or minimize potential environmental effects?

All interested agencies, organizations and individuals are invited to attend a scoping meeting webinar providing an overview of the EIR scope and/or submit comments on the project. The scoping meeting for Plan Bay Area 2050+ will be held on January 29, 2025, at 1:00 p.m. The meeting will be held virtually at the following Zoom link: https://bayareametro.zoom.us/j/84828971011?pwd=HawKgsJQFLsnvgkUSLGxMvThkEzhfg.FyEx6Dpdgt21yXRV

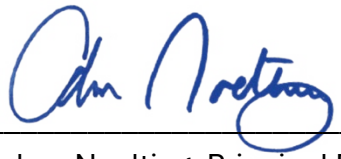
If you choose to phone in for audio only, please dial 1-877-853-5247 and enter Webinar ID: 848 2897 1011 and Passcode: 812438.

Written comments are also being accepted via email to eircomments@bayareametro.gov; via mail to MTC Public Information, Attn: Veronica Cummings, 375 Beale Street, Suite 800, San Francisco, CA, 94105; or via fax to 415.536.9800. **All written comments must be received no later than February 12, 2025.** For more information, call the MTC Public Information Office at 415.778.6757.

Do you need an interpreter or any other assistance to participate? Please call 415-778-6757. We require at least three working days' notice to provide reasonable accommodation. For TDD or hearing impaired, call 711, California Relay Service, or 1-800-735-2929 (TTY), 1-800-735-2922 (voice) and ask to be relayed to 415-778-6700.

¿Necesita un intérprete u otra asistencia para participar? Por favor llame al 415-778-6757. Solicitamos tres días hábiles para poder coordinar servicios de interprete. Para servicios de TDD o para sordomudos, favor de llamar al 711 al Servicio de Retransmisión de California o al 1-800-735-2929 (para TTY) o al 1-800-735-2922 (para voz) y pida que lo conecten al 415-778-6700.

您是否需要翻譯員或任何其他幫助才能參加呢？請提前三天致電 415-778-6757. 有聽覺或者语言障碍的人士, 请打电话到 711, 加州传达服务. 电传打字机的联系号码是 1-800-735-2929, 需要语音服务可以打电话到 1-800-735-2922, 然后要求传达到 415-778-6700.



Adam Noelting, Principal Planner
Plan Bay Area 2050+ EIR Project Manager

NOTICE OF PREPARATION

Draft Environmental Impact Report for Plan Bay Area 2050+

Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area
Metropolitan Transportation Commission/Association of Bay Area Governments

ATTACHMENT A

Responsibilities and Requirements

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area (which includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties). Created by the State Legislature in 1970, MTC functions as both the regional transportation planning agency (RTPA), which is a state designation, and as the region's metropolitan planning organization (MPO), which is a federal designation.

ABAG was formed in 1961 by a joint powers agreement among Bay Area local governments and serves as the comprehensive regional planning agency and Council of Governments (COG) for the nine counties and 101 cities and towns of the San Francisco Bay Region. ABAG is a public entity created by local governments to meet their planning and research needs related to land use and is responsible under state law to conduct the Regional Housing Needs Allocation (RHNA) process. ABAG also hosts several joint powers and administrative entities related to environmental and water resource protection, disaster resilience, energy efficiency and hazardous waste mitigation, financial services and staff training to local counties, cities and towns.

Per federal planning requirements, a Regional Transportation Plan (RTP) is a long-range plan that identifies the strategies and investments to maintain, manage, and improve the region's transportation network. The RTP must address no less than a 20-year planning horizon and include long-range and short-range strategies and actions that support the development of an integrated multimodal transportation system. The RTP must be updated at least every four years and seek to address projected transportation demand over the RTP planning horizon and pursue operational and management strategies that will improve the performance of the transportation system. The RTP must have a fiscally constrained financial plan that demonstrates how the RTP can be implemented and how the transportation system can be operated and maintained using revenues reasonably expected to be available over the planning horizon. The RTP also has myriad state and federal requirements with respect to public participation, equity and environmental justice, and air quality conformity, among others. As required by state legislation (Government Code Section 65080 et. seq.) and by federal regulation (Title 23 USC Section 134), MTC is responsible for preparing the RTP for the San Francisco Bay Area region.

Regional transportation planning, local land use planning and regional housing allocations are more closely aligned because of the passage of California's Sustainable Communities and Climate Protection Act (SB 375 (Steinberg)) signed into law in 2008. MTC and ABAG are jointly required by SB 375 to develop the Sustainable Communities Strategy (SCS) that accompanies the RTP. The SCS must identify the general location of land uses, residential densities, and building intensities within the region; identify areas within the region sufficient to house all the

population of the region, including all economic segments of the population; identify areas within the region sufficient to house an 8-year projection of the regional housing need; identify a transportation network to serve regional transportation needs; gather and consider the best practically available scientific information regarding resource areas and farmland in the region; consider the state's housing goals; set forth a forecasted development pattern for the region; and allow the regional transportation plan to comply with the federal Clean Air Act. (Gov. Code, § 65080, subd. (b)(F)(2)(B)).

Together, the plan (RTP/SCS) should support the reduction of per-capita passenger vehicle-generated greenhouse gas (GHG) emissions by identifying policies and strategies that integrate land use and transportation planning. Plan Bay Area 2050+ will meet the requirements of SB 375 by attaining or exceeding a per-capita GHG emission target of 19 percent reduction by year 2035 from 2005 levels, as established for the San Francisco Bay Area by the California Air Resources Board (CARB). If the plan does not achieve the GHG emission target set by CARB, an Alternative Planning Strategy (APS) must be developed to demonstrate how the target could be achieved.

VISION AND GUIDING PRINCIPLES

Plan Bay Area 2050+ is designed to meet or exceed federal and state planning requirements while offering a more aspirational vision for the San Francisco Bay Area's future. MTC and ABAG jointly adopted the Vision for the region's current RTP/SCS, Plan Bay Area 2050, in September 2019, following an outreach and engagement effort to identify the most pressing planning issues to address by the year 2050. This vision, emphasizing resilient and equitable strategies, has been carried forward into Plan Bay Area 2050+. The guiding principles of this vision are defined as follows:

- **Affordable**: All Bay Area residents and workers have sufficient housing options they can afford—households are economically secure.
- **Connected**: An expanded, well-functioning, safe and multimodal transportation system connects the Bay Area – fast, frequent and efficient intercity trips are complemented by a suite of local transportation options, connecting communities and creating a cohesive region.
- **Diverse**: The Bay Area is an inclusive region where people from all backgrounds, abilities and ages can remain in place – with full access to the region's assets and resources.
- **Healthy**: The region's natural resources, open space, clean water and clean air are conserved – the region actively reduces its environmental footprint and protects residents from environmental impacts.
- **Vibrant**: The Bay Area is an innovation leader, creating quality job opportunities for all and ample fiscal resources for communities.

CEQA STREAMLINING

SB 375 contains CEQA incentives, or streamlining provisions, to encourage coordinated land use and transportation planning. Certain types of development projects (i.e., transit priority projects or residential/mixed use residential projects, as defined by statute) may qualify for CEQA streamlining as long as the requisite criteria are met. Consistency with the SCS will be determined by the local jurisdiction that is the lead agency for each project to be streamlined. MTC and ABAG will include appropriate information in the SCS, such as land use information as required by SB 375 and/or guidance to aid in interpreting land use information, that will allow a jurisdiction to make a consistency determination with respect to appropriate streamlining options on a project-by-project

basis. Additionally, the EIR will support other CEQA streamlining options that do not fall into the categories under SB 375, such as SB 743, SB 226 and other provisions of the State CEQA guidelines.

Plan Bay Area 2050+ Project Description

Plan Bay Area 2050+ is a limited and focused update to the region's long-range plan to guide the growth of the nine-county San Francisco Bay Area. Plan Bay Area 2050+ will focus on four key elements—transportation, housing, the economy, and the environment—and will identify a path to make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. Plan Bay Area 2050+ refines select plan strategies to integrate the lessons of the last three years and will enable continued progress implementing the strategies of Plan Bay Area 2050.

REGIONAL GROWTH FORECAST

The Plan Bay Area 2050+ Regional Growth Forecast identifies how much the Bay Area might grow between the plan baseline year (2023) and the plan horizon year (2050), including population, jobs, households, and associated housing units. The forecast also includes important components of that growth, including employment by sector, population by age and race/ethnic characteristics, and households by income level.

Plan Bay Area 2050+ forecasts that by 2050, the Bay Area will have over 9.5 million residents, 5.4 million jobs, 3.7 million households, and 3.9 million housing units, as shown in the table below. The updated forecasts indicate lower population and household numbers compared to those forecasted in Plan Bay Area 2050, while employment levels remain similar. These adjustments reflect a declining national population outlook alongside a strong regional job projection.

Plan Bay Area 2050+ Regional Growth Forecast			
	2020	**2035**	**2050**
Total Population	7,749,000	8,476,000	9,586,000
Total Employment	4,025,000	4,855,000	5,436,000
Total Households	2,798,000	3,312,000	3,796,000
Total Housing Units	2,875,000	3,486,000	3,996,000

GROWTH GEOGRAPHIES

To plan for this future growth and meet the greenhouse gas emissions reduction target established pursuant to SB 375, Plan Bay Area 2050+ identifies specific areas prioritized for new housing and jobs, known as Growth Geographies. For housing, Growth Geographies include Priority Development Areas (PDAs), Transit-Rich Areas (TRAs), and High-Resource Areas (HRAs). For jobs, Growth Geographies include Priority Production Areas (PPAs), PDAs, and TRAs. A map of the plan's Growth Geographies is included as Attachment B.

PLAN REVENUES AND STRATEGIES

Plan Bay Area 2050+ includes a financially constrained investment plan for the Transportation Element, as required by state and federal planning regulations. It includes transportation projects and programs that can be funded through existing and new revenues projected to be reasonably available to the region over the plan's horizon. The plan also estimates needs for the Housing,

Economy, and Environment elements, which are not subject to fiscal constrain requirements but illustrate what is needed to meet key regional goals.

Across all elements—transportation, housing, economy, and environment—the plan forecasts a total of $615 billion in existing revenues and at least $862 billion in new revenues, as shown in the table below.

Plan Bay Area 2050+ Regional Revenues and Investments			
	Existing Revenues[1]	**New Revenues**[2]	**Strategy Investment**
Transportation Strategies	$423 billion	$89 billion	$500 billion
Housing Strategies	$161 billion	$339 billion	$500 billion
Economy Strategies	N/A	$246 billion	$246 billion
Environment Strategies	$31 billion	$188 billion	$229 billion

Note: Revenues may not sum to strategy investments due to rounding.

To advance the Plan Bay Area 2050+ Vision and meet or exceed state and federal planning requirements, including state-mandated GHG emissions reduction targets, select strategies across all four elements have been refined to incorporate progress and insights from the past three years. Refinements to the transportation strategies incorporate recommendations from the parallel Transit 2050+ planning process, conducted in partnership with Bay Area transit operators to develop a comprehensive transit network and revamp the region's transit-related strategies.

The Plan Bay Area 2050+ strategies are organized into eleven key themes:

[1] Existing economic development revenues were not inventoried. $11 billion in existing transportation revenues are used to support Environment strategies.
[2] New revenues are estimates based upon Final Blueprint strategies; estimates subject to change.

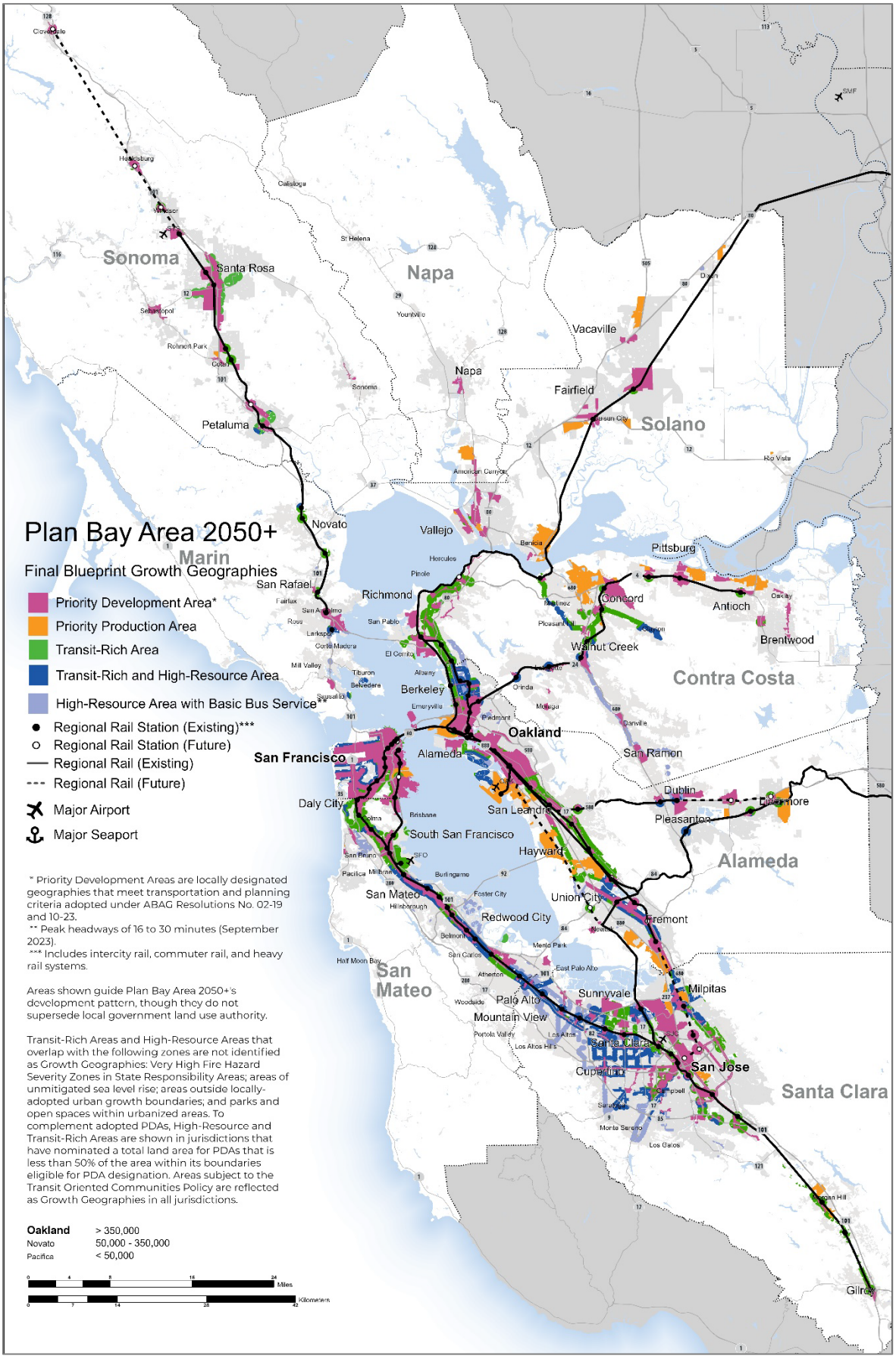
Element	Theme	Strategy
Transportation		
	Maintain and Optimize the Existing System	1. Operate and Maintain the Existing System 2. Improve the Rider Experience through Transit Network Integration 3. Improve the Rider Experience through Refined Transfer Timing at Key Regional Hubs 4. Enhance Security Measures and Improve Safety and Cleanliness on Transit 5. Implement Pricing Strategies to Manage Demand 6. Modernize Freeways and Interchanges 7. Expand Freeways and Mitigate Impacts 8. Advance Other Regional Programs and Local Priorities
	Create Healthy and Safe Streets	9. Build a Complete Streets Network 10. Advance Regional Vision Zero Policy through Street Design and Reduced Speeds
	Build a Next-Generation Transit Network	11. Enhance Transit Frequency, Capacity and Reliability 12. Expand Transit Services throughout the Region
Housing		
	Protect and Preserve Affordable Housing	1. Strengthen Renter Protections 2. Preserve Existing Affordable Housing
	Spur Housing Production at All Income Levels	3. Allow a Greater Mix of Housing Densities and Types in Growth Geographies 4. Build Adequate Affordable Housing to Ensure Homes for All 5. Integrate Affordable Housing into All Major Housing Projects 6. Transform Aging Malls and Office Parks into Neighborhoods
	Create Inclusive Communities	7. Provide Targeted Mortgage, Rental, and Small Business Assistance to Equity Priority Communities 8. Accelerate Reuse of Public and Community-Owned Land for Mixed Income Housing and Essential Services
Economy		
	Improve Economic Mobility	1. Implement a Statewide Guaranteed Income 2. Expand Job Training and Incubator Programs 3. Invest in High-Speed Internet in Underserved Low-Income Communities
	Shift the Location of Jobs	4. Allow a Greater Mix of Land Uses and Densities in Growth Geographies 5. Provide Incentives to Employers to Locate in Low-VMT Areas 6. Retain and Invest in Key Industrial Lands
Environment		
	Reduce Risks from Hazards	1. Adapt to Sea Level Rise 2. Provide Means-Based Financial Support for Seismic, Wildfire, and Accessibility Home Retrofits 3. Provide Means-Based Financial Support for Energy Decarbonization and Water Efficiency Upgrades in All Buildings
	Expand Access to Parks and Open Space	4. Maintain Urban Growth Boundaries 5. Protect and Manage High-Value Conservation Lands 6. Expand Urban Greening in Communities
	Reduce Climate Emissions	7. Expand Commute Trip Reduction Programs at Major Employers 8. Expand Clean Vehicle Initiatives 9. Expand Transportation Demand Management Initiatives

EQUITY AND PERFORMANCE OUTCOMES

Plan Bay Area 2050+ is required by state mandates to accommodate future growth in a more sustainable manner by reducing per capita GHG emissions and providing adequate housing for the region's projected population growth at all income levels. To determine whether the plan is on track to achieve its Vision, the plan includes the same questions for each Guiding Principle from Plan Bay Area 2050. These questions, shown below, are accompanied by draft metrics that are intended to aid in the analysis of the plan's performance.

Guiding Principle	Question	Metric
Affordable		
	Will Bay Area residents spend less on housing and transportation?	• Housing and Transportation Costs as Share of Income • Transport Expenses per Trip
	Will the Bay Area produce and preserve more affordable housing?	• Share of Housing that is Deed-Restricted Affordable • Share of New Housing Production that is Deed-Restricted Affordable • Share of At-Risk Affordable Housing Preserved as Permanently Affordable
Connected		•
	Will Bay Area residents be able to access their destinations more easily?	• Number and Share of all Bay Area Jobs that are Accessible by Frequent Transit • Share of Households and Jobs Within 1/2 Mile of Frequent Transit
	Will Bay Area residents have a transportation system they can rely on?	• Freeway corridor morning peak-hour travel time (minutes) • Share of Transit Assets Past Their Useful Life Benchmark
Diverse		
	Will Bay Area communities be more inclusive?	• Share of households with low incomes • Home Ownership Rate for Households with Low Incomes
	Will Bay Area residents be able to stay in place?	• Share of Neighborhoods (Tracts) that Experience Displacement and Gentrification between 2023 and 2050
Healthy		
	Will Bay Area residents be healthier and safer?	• Percent of households in risk-prone areas/buildings that are protected/retrofit • Reduction in building risk exposure to damage from earthquake or wildfire • Annual incidents per one hundred thousand residents • Daily PM2.5 Emissions (TONs) • Parks and trails per thousand residents
	Will the environment of the Bay Area be healthier and safer?	• Daily CO2 Emissions Per Capita, Relative to 2005 • Commute Mode Share • Efficiency of building stock, relative to 2023
Vibrant		
	Will the Bay Area economy thrive?	• Per Capita Gross Regional Product • Growth in number of jobs
	Will the region's downtowns recover from the pandemic?	• Change in In-Person Workers, Visitors, and Residents by Downtown Area • Does the location of job growth shift toward Growth Geographies? • Jobs to Housing Ratio

ATTACHMENT B



Appendix B

Scoping Report and Notice of Preparation Comments

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
(707) 428-2002
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

February 6, 2025

Adam Noelting, Principal Planner
Metropolitan Transportation Commission
375 Beale Street
San Francisco, CA 94105
ANoelting@bayareametro.gov

Subject: Plan Bay Area 2050+ (Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area), Notice of Preparation of a Draft Environmental Impact Report, SCH No. 2025010348, Nine-County San Francisco Bay Area

Dear Mr. Adam Noelting:

The California Department of Fish and Wildlife (CDFW) has reviewed the Metropolitan Transportation Commission/Association of Bay Area Governments' (MTC/ABAG) Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) for the Plan Bay Area 2050+ (Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area) (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect fish and wildlife resources of the State. Please be advised, by law, CDFW may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW is providing the MTC/ABAG, as the Lead Agency, with specific detail about the scope and content of the environmental information related to CDFW's area of statutory responsibility that must be included in the EIR (Cal. Code Regs., tit. 14, § 15082, subd. (b)).

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) For purposes of CEQA, CDFW

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority over the Project pursuant to the Fish and Game Code. For example, the Project may be subject to CDFW's Lake and Streambed Alteration (LSA) regulatory authority, if the Project impacts the bed, channel or bank of any river, stream or lake within the State (Fish & G. Code, § 1600 et seq.). Likewise, to the extent the Project may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

REGULATORY REQUIREMENTS

California Endangered Species Act

A CESA Incidental Take Permit (ITP) must be obtained from CDFW if the Project has the potential to result in "take" of plants or animals listed under CESA, either during construction or over the life of the Project. Under CESA, "take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." (Fish & G. Code, § 86.) CDFW's issuance of an ITP is subject to CEQA and to facilitate permit issuance, any project modifications and mitigation measures must be incorporated into the CEQA document analysis, discussion, and mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA permit.

CEQA requires a mandatory finding of significance if a project is likely to substantially impact threatened or endangered species. Pub. Resources Code, §§ 21001, subd. (c) & 21083; CEQA Guidelines, §§ 15380, 15064 & 15065.) In addition, pursuant to CEQA, the Lead Agency cannot approve a project unless all impacts to the environment are avoided or mitigated to less-than-significant levels, or the Lead Agency makes and supports findings of overriding consideration for impacts that remain significant despite the implementation of all feasible mitigation. Findings of consideration under CEQA, however, do not eliminate the Project proponent's obligation to comply with the Fish and Game Code.

Lake and Streambed Alteration

CDFW requires an LSA Notification, pursuant to Fish and Game Code section 1600 et seq., for Project activities affecting river, lakes or streams and associated riparian

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habitat. Notification is required for any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank (including associated riparian or wetland resources); or deposit or dispose of material where it may pass into a river, lake, or stream. Work within ephemeral streams, drainage ditches, washes, watercourses with a subsurface flow, and floodplains is generally subject to notification requirements. In addition, infrastructure installed beneath such aquatic features, such as through hydraulic directional drilling, is also generally subject to notification requirements**.** Therefore, any impact to the mainstems, tributaries, or floodplains or associated riparian habitat caused by the proposed Project will likely require an LSA Notification. CDFW may not execute a final LSA Agreement until it has considered the final EIR and complied with its responsibilities as a Responsible Agency under CEQA.

Migratory Birds and Raptors

CDFW has authority over actions that may result in the disturbance or destruction of active bird nest sites or the unauthorized take of birds. Fish and Game Code sections protecting birds, their eggs, and nests include section 3503 (regarding unlawful take, possession, or needless destruction of the nests or eggs of any bird), section 3503.5 (regarding the take, possession, or destruction of any birds-of-prey or their nests or eggs), and section 3513 (regarding unlawful take of any migratory nongame bird). Migratory birds are also protected under the federal Migratory Bird Treaty Act.

PROJECT DESCRIPTION AND LOCATION SUMMARY

Proponent: Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG)

Objective: The objective of the Project is to develop a regional land use and transportation plan.

Location: Counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, citywide in the San Francisco Bay Area.

Timeframe: 2025-2050

The CEQA Guidelines (§§15124 & 15378) require that the draft EIR incorporate a full Project description, including reasonably foreseeable future phases of the Project, and that contains sufficient information to evaluate and review the Project's environmental impact. Please include a complete description of the following Project components in the Project description including but not limited to the information below.

- Land use changes resulting from, for example, rezoning certain areas.

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- Footprints of permanent Project features and temporarily impacted areas, such as staging areas and access routes.

- Area and plans for any proposed buildings/structures, ground disturbing activities, fencing, paving, stationary machinery, landscaping, and stormwater systems.

- Operational features of the Project, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise, traffic generation, and other features.

ENVIRONMENTAL SETTING

Sufficient information regarding the environmental setting is necessary to understand any potentially significant impacts on the environment of the proposed Project and any alternatives identified in the draft EIR (CEQA Guidelines, §§15125 & 15360). CDFW recommends the draft EIR provide baseline habitat assessments for special-status plant, fish and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, and endangered species (CEQA Guidelines, §15380). The draft EIR should describe aquatic habitats, such as wetlands or waters of the U.S. or State, and any sensitive natural communities or riparian habitat occurring on or adjacent to the Project site (for sensitive natural communities see:https://wildlife.ca.gov/Data/VegCAMP/NaturalCommunities#sensitive%20natural%20communities), and any stream, riparian, or wetland set back distances the Cities may require. Fully protected, threatened or endangered, candidate, and other special-status species or sensitive natural communities that are known to occur, or have the potential to occur in or near the nine-county San Francisco Bay Area include, but are not limited to: the species listed in **Attachment A**.

Habitat descriptions and species profiles included in the draft EIR should include robust information from multiple sources: aerial imagery; historical and recent survey data; field reconnaissance; scientific literature and reports; U.S. Fish and Wildlife Service's (USFWS) Information, Planning, and Consultation System; California Aquatic Resources Inventory; and findings from "positive occurrence" databases such as California Natural Diversity Database (CNDDB). Only with sufficient data and information can the MTC/ABAG adequately assess which special-status species are likely to occur in the Project vicinity.

CDFW recommends surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at:
https://www.wildlife.ca.gov/Conservation/Survey-Protocol.

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Botanical surveys for special-status plant species, including those listed by the California Native Plant Society (http://www.cnps.org/cnps/rareplants/inventory/), should also be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and include the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.

IMPACT ANALYSIS AND MITIGATION MEASURES

The CEQA Guidelines (§15126.2) necessitate the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as:

- Land use changes that would reduce open space or agricultural land uses and increase residential or other land use involving increased development;
- Potential for impacts to fully protected and special-status species;
- Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence; and
- Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features.
- Water quality impacts resulting from construction and operation of the Project; and
- Impacts to the bed, channel, and bank, in the reservoirs and creeks downstream of the Project;

The CEQA document also should identify existing and reasonably foreseeable future projects in the Project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the Project's contribution to each impact (CEQA Guidelines, §15355). Although a project's impacts may be insignificant individually, its contributions to a cumulative impact may be considerable; a contribution to a significant cumulative impact (e.g., reduction of available habitat for a listed species) should be considered cumulatively considerable without mitigation to minimize or avoid the impact.

The CEQA Guidelines direct the MTC/ABAG, as the Lead Agency, to consider and describe in the draft EIR all feasible mitigation measures to avoid and/or mitigate potentially significant impacts of the Project on the environment based on comprehensive analysis of the potential direct, indirect, and cumulative impacts of the

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Project. (CEQA Guidelines, §§ 15021, 15063, 15071, 15126.2, 15126.4 & 15370.) This should include a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the USFWS, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels.

Fully protected species may not be taken or possessed at any time except in limited circumstances (Fish & G. Code, §§ 3511, 4700, 5050, & 5515). Therefore, the draft EIR should include measures to completely avoid “take” of fully protected species.

CDFW COMMENTS

The Project baseline environmental setting should be determined using an appropriate geographic scale to understand potentially significant impacts on the environment. To meaningfully evaluate potential impacts to special-status plant, fish and wildlife species, and critical habitat and connectivity corridors, impact assessments should be provided for each parcel within redesignated or rezoned locations.

The transportation and land use strategies may lead to habitat fragmentation, impacting wildlife corridors and connectivity across key areas such as the East Bay Hills, Santa Cruz Mountains, and the Bay-Delta estuary. Ensure the draft EIR assesses the Project’s effects on habitat connectivity and wildlife movement corridors, consistent with California Department of Fish and Wildlife’s guidance on wildlife linkages. The draft EIR should consider aquatic connectivity for species such as salmon and steelhead, along with terrestrial corridors linking parklands and open spaces. CDFW recommends the draft EIR evaluates the effects of transportation infrastructure on aquatic connectivity and incorporates avoidance measures such as wildlife crossings and habitat buffers.

The Project plan should align with existing Regional Conservation Investment Strategies (RCIS) for the Bay Area, focusing on landscape-scale conservation to protect biodiversity and mitigate development impacts. The draft EIR to analyze potential conflicts with Natural Community Conservation Planning (NCCP)/Habitat Conservation Program (HCP) objectives and require consistency with adopted conservation strategies to avoid habitat loss.

Also, CDFW recommends the draft EIR assess Plan Bay Area 2050+ compliance with AB 1889 and provide recommendations for local policy integration.

The draft EIR should consider potential impacts on state-managed lands, such as wildlife areas and ecological reserves, including recreational and ecosystem services impacts. CDFW recommends the draft EIR include a thorough analysis of impacts to CDFW lands, with mitigation measures for disturbance, habitat degradation, and increased human-wildlife conflicts.

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Given the Bay Area's vulnerability to sea level rise, wildfires, and drought, the plan must incorporate adaptation strategies to maintain ecological integrity under climate change scenarios. CDFW recommends that the draft EIR provides a robust cumulative impact analysis that considers regional development trends and their impacts on biological biodiversity.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to prepare subsequent CEQA documents or to make supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (d) & (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to CNDDB. The CNDDB field survey form can be filled out and submitted online here: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data. The types of information reported to CNDDB can be found here: https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

ENVIRONMENTAL DOCUMENT FILING FEES

CDFW anticipates that the proposed Project, will have an impact on fish and/or wildlife, and assessment of environmental document filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the environmental document filing fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP in order to assist the MTC/ABAG in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Jason Teichman, Environmental Scientist, at 707-210-5104 or Jason.Teichman@wildlife.ca.gov; or Wesley Stokes, Senior Environmental Scientist, (Supervisory), at (707) 339-6066 or Wesley.Stokes@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Erin Chappell
B77E9A6211EF486...

Erin Chappell
Regional Manager
Bay Delta Region

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Attachments: Attachment A: Biological resources: Counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma. RareFind, January 27, 2025

ec: Office of Planning and Research, State Clearinghouse (SCH No. 2025010348)
Jason Teichman, CDFW Bay Delta Region - Jason.teichman@wildlife.ca.gov

REFERENCES

Notice of Preparation (NOP), Program Environmental Impact Report, Plan Bay Area 2050+ (Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area), January 24, 2025.

RareFind and California Natural Diversity Database (CNDDB) accessed January 27, 2025.

California Department of Transportation

DISTRICT 4
OFFICE OF REGIONAL AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

February 13, 2025

SCH #: 2025010348
GTS #: 04-MULTIPLE-2025-00420
GTS ID: 35209
Co/Rt/Pm: VAR/VAR/VAR

Adam Noelting, Principal Planner
Metropolitan Transportation Commission (MTC)
375 Beale Street, Suite 800
San Francisco, CA 94105

Re: Plan Bay Area 2050+ — Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR)

Dear Adam Noelting:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Plan Bay Area 2050+ project. The Local Development Review (LDR) Program reviews land use projects and plans to ensure consistency with our mission and state planning priorities. The following comments are based on our review of the January 2025 NOP.

Please note this correspondence does not indicate an official position by Caltrans on this project and is for informational purposes only.

Project Understanding
Plan Bay Area 2050+ is designed to serve as the 2025 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the San Francisco Bay Area. In addition to the focus on transportation and land use, Plan Bay Area 2050+ incorporates economic and environmental issues into the plan; taken as a package, the plan identifies a suite of integrated strategies that will enable the Bay Area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges.

Travel Demand Analysis
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Vehicle

Miles Traveled (VMT) analysis for land use projects, please review Caltrans' Transportation Impact Study Guide (*link*). Caltrans will review the VMT analysis in the DEIR when it is available and has a comment on the following Transportation Strategy identified in the NOP:

Element	**Theme**	**Strategy**
Transportation	Maintain and Optimize the Existing System	Expand Freeways and Mitigate Impacts

The Climate Action Plan for Transportation Infrastructure (CAPTI) guiding principles include promoting projects that do not significantly increase passenger vehicle travel. Caltrans encourages sustainable transportation alternatives to highway capacity expansion that will not induce VMT and Greenhouse Gas (GHG) emissions.

Multimodal Transportation Planning
Please review and include reference to the *Caltrans District 4 Pedestrian Plan* (2021) and the *Caltrans District 4 Bike Plan* (2018) in the DEIR. These two plans studied existing conditions for walking and biking along and across the State Transportation Network (STN) in the nine-county Bay Area and developed a list of location-based and prioritized needs.

Please note that any Complete Streets reference should be updated to reflect Caltrans Director's Policy 37 (*link*) that highlights the importance of addressing the needs of non-motorists and prioritizing space-efficient forms of mobility, while also facilitating goods movement in a manner with the least environmental and social impacts. This supersedes Deputy Directive 64-R1, and further builds upon its goals of focusing on the movement of people and goods.

Integrated Transportation and Land Use Planning
Please review and include reference to the current California Transportation Plan (CTP) in the DEIR. CTP 2050 envisions that the majority of new housing located near existing housing, jobs, and transit, and in close proximity to one another will reduce vehicle travel and GHG emissions, and be accessible and affordable for all Californians, including disadvantaged and low-income communities. The location, density, and affordability of future housing will dictate much of our future travel patterns, and our ability to achieve the vision outlined in CTP 2050. Caltrans encourages MTC to consider and explore the potential of excess state-owned property for affordable housing development, per Executive Order N-06-19.

The DEIR should demonstrate how the future housing development patterns align with the agency's adopted VMT policies. Caltrans supports collaboration with external

agencies to work towards a safe, functional, interconnected, multi-modal transportation network integrated through efficient and equitable land use planning and policies. MTC should also continue to coordinate with Caltrans to identify and implement necessary network improvements and impact mitigation.

Equity and Public Engagement
Caltrans is committed to advancing equity and livability in all communities. Equity will be achieved when everyone has access to what they need to thrive no matter their race, socioeconomic status, identity, where they live, or how they travel. Caltrans looks forward to collaborating with MTC to prioritize projects that are equitable and provide meaningful benefits to historically underserved communities.

Caltrans encourages MTC to foster meaningful, equitable and ongoing public engagement in the Plan Bay Area 2050+ development process to ensure future transportation decisions and investments reflect community interests and values. The public engagement process should include community-sensitive and equity-focused approaches seeking out the needs of individuals from underserved, Tribal, and low-income communities, the elderly, and individuals with disabilities.

Caltrans has comments pertaining to the following draft metrics identified in the NOP for the Plan's Equity and Performance Outcomes:

Guiding Principle	Question	Metric
Diverse	Will Bay Area residents be able to stay in place?	Share of Neighborhoods (Tracts) that Experience Displacement and Gentrification between 2023 and 2050

Please clarify how MTC will measure levels of gentrification given the phenomenon of gentrification is loosely and often subjectively defined and can therefore be difficult to measure empirically.

Native American Consultation
Per Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) Certification review recommendations, each Native American Tribe should concur with MTC consultation methods and techniques. Please note some Tribes prefer the individualized consultation approach. MTC should contact the California Native American Heritage Commission to obtain a list of both federally recognized and non-federally recognized Native American Tribes.

Caltrans recommends the MTC reach out to each of the six federally recognized Tribes in the nine Bay Area counties and obtain their approval regarding consultation methods. These tribes include: the Cloverdale Rancheria of Pomo Indians, the Dry

Creek Rancheria Band of Pomo Indians, the Federated Indians of Graton Rancheria, the Kashia Band of Pomo Indians of the Stewarts Point Rancheria, the Koi Nation of Northern California, and the Lytton Rancheria Band of Pomo Indians.

The Plan Bay Area 2050+ DEIR should also consider the significance of Tribal cultural resources, including any regulations, policies, or standards by MTC to determine significance of tribal cultural resources, and significance of the proposed project's impacts on Tribal cultural resources. Please also include in the analysis of Climate Change its environmental impact on all Native American Tribes within and outside of sovereign land in the Bay Area.

Environment
Caltrans would like to reiterate comments previously provided on the following environmental strategies in the August 2024 review of the Plan Bay Area 2050+ draft Blueprint Strategies:

Element	Theme	Strategy
Environment	Reduce Risks from Hazards	Adapt to Seal Level Rise
	Expand Access to Parks and Open Space	Protect and Manage High-Value Conservation Lands

Regarding sea level rise, please clarify why 4.9 feet was chosen for a plan with a horizon 2050+. Consider another estimate of sea level rise for planning beyond 2050, based on the extended timeline indicated by the '+'. Many resource agencies, particularly the California Coastal Commission, emphasize managed retreat over further armoring or protection. While managed retreat is somewhat mentioned in the Long-Term Strategy Description, the primary focus of the strategy is on funding for armoring and protective measures. The adaptation planning approach should consider managed retreat as both a short- and long-term solution for community infrastructure and a way to mitigate the impacts of rising sea levels.

Caltrans suggests enhancing the strategy to protect and manage high-value conservation lands by starting with an important edit to the strategy name to not only 'protect' and 'manage' high-value conservation lands but also ensure connectivity of those lands, creating a larger mosaic of connected and conserved high-value conservation lands. We propose changing the name of this strategy to 'Protect, Manage, and Connect High-Value Conservation Lands.' The focus should be on identifying lands that can be connected as well as protected, and using appropriate land-use and permitting to establish sufficient natural connectivity corridors that interlink protected and managed high-value conservation lands. Creating a mosaic of

connected conservation lands will provide greater ecological stability to those individual lands, as well as facilitate movement and genetic mixing, which is crucial for the stability and efficacy of these lands over the long term. Emphasizing connectivity can also serve as a showcase and part of mitigation efforts to offset impacts from future development.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Llisel Ayon, Acting Branch Chief, via LDR-D4@dot.ca.gov. For future early coordination opportunities or project referrals, please visit Caltrans LDR website (*link*) or contact LDR-D4@dot.ca.gov.

Sincerely,

Llisel Ayon

Llisel Ayon
Acting Branch Chief, Local Development Review
Office of Regional and Community Planning

c: State Clearinghouse

Delta Stewardship Council
A CALIFORNIA STATE AGENCY

715 P Street, 15-300
Sacramento, CA 95814

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Jessica R. Pearson

February 14, 2025

Adam Noelting
Metropolitan Transportation Commission/Association of Bay Area Governments
375 Beale Street, Suite 800
San Francisco, CA 94105

Delivered via email: eircomments@bayareametro.gov

RE: Comments on Notice of Preparation of an Environmental Impact Report for the Plan Bay Area 2050+, SCH#2025010348

Dear Adam Noelting:

Thank you for the opportunity to review and comment on the Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG) Notice of Preparation (NOP) of an Environmental Impact Report for Plan Bay Area 2050+, a regional transportation plan (RTP) and sustainable community strategy (SCS). The Delta Stewardship Council (Council) recognizes the objectives of Plan Bay Area 2050+, as described in the NOP, to serve as the long-range regional plan for transportation, housing, the economy, and the environment in the nine-county San Francisco Bay Area region. This letter summarizes requirements of the Sacramento-San Joaquin Delta Reform Act of 2009 (Wat. Code, § 85000 et seq.; Delta Reform Act), the Council's enabling statute, pertaining to Plan Bay Area 2050+, and provides the Council's comments on the NOP regarding the scope and content of the EIR for Plan Bay Area 2050+.

The Council is an independent state agency established by the Delta Reform Act The Delta Reform Act charges the Council with furthering California's coequal goals of providing a more reliable water supply and protecting, restoring, and enhancing the Sacramento-San Joaquin River Delta (Delta) ecosystem. (Wat. Code, § 85054.) The Delta Reform Act further states that the coequal goals are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. (Wat. Code, § 85054.) The Council is charged with furthering California's coequal goals for the Delta through the adoption and implementation of the Delta Plan. (Wat. Code, § 85300.)

The Delta Plan contains regulatory policies, which are set forth in California Code of Regulations, title 23, sections 5001 et seq. Through the Delta Reform Act, the Council was granted specific regulatory and appellate authority over certain actions of state or local public agencies that take place in whole or in part in the Delta and Suisun Marsh. (Wat. Code, §§ 85210.) A state or local agency that proposes to undertake a covered action is required to prepare a written Certification of Consistency with detailed findings as to whether the covered action is consistent with the Delta Plan and submit that Certification to the Council prior to initiation of the implementation of the project. (Wat. Code, § 85225.)

Delta Reform Act Requirements for Regional Transportation Plans and Sustainable Communities Strategies

1. Early Consultation

The Delta Reform Act grants the Council specific authority to review and advise local and regional planning agencies regarding the consistency of local and regional planning documents, including SCSs and alternative planning strategies, with the Delta Plan. (Wat. Code, § 85212.) The Delta Reform Act requires a metropolitan planning organization preparing a RTP that includes land within the Delta primary or secondary zones to consult with the Council early in the planning process regarding the issues and policy choices relating to the Council's advice. (Wat. Code, § 85212.)

2. Council's Review of the Draft Sustainable Communities Strategy

Plan Bay Area 2050+ is a RTP/SCS for the nine-county San Francisco Bay Area region that includes land within the Delta and Suisun Marsh, specifically in portions of Alameda, Contra Costa, and Solano Counties. In addition to early consultation, as described above, Water Code section 85212 of the Delta Reform Act requires MTC/ABAG to provide to the Council both of the following:

- a draft SCS and an alternative planning strategy **no later than 60 days prior to the adoption of the final Plan Bay Area 2050+**.

- **a concurrent** notice of its submission of the SCS in the same manner as a Certification of Consistency via electronic mail to coveredactions@deltacouncil.ca.gov.

If the Council concludes that the submitted draft SCS, or alternative planning strategy, is inconsistent with the Delta Plan, the Council will provide to MTC/ABAG a written notice of the claimed inconsistency **no later than 30 days prior to the adoption of the final Plan Bay Area 2050+**. If MTC/ABAG receives a timely written notice of inconsistency from the Council, MTC/ABAG's adoption of the final Plan Bay Area 2050+ must include a detailed response to the Council's notice. (Wat. Code, § 85212.)

Please notify the Council via electronic mail addressed to Eva Bush (Eva.Bush@deltacouncil.ca.gov) when the adoption hearings for the final Plan Bay Area 2050+ are scheduled. The Council also would welcome a presentation by MTC/ABAG staff to the Council on the draft SCS at a future Council meeting prior to the final adoption hearings.

Comment on Scope and Content of EIR for Plan Bay Area 2050

A state or local agency that proposes to carry out, approve, or fund an action that occurs in whole or in part in the Delta (covered action) is required to first determine whether that action is a covered action and if so, prepare a written Certification of Consistency with detailed findings as to whether the covered action is consistent with the Delta Plan. (Cal. Code Regs., tit. 23, § 5001, subd. (k); Wat. Code, § 85225.) The state or local agency then is required to submit that Certification of Consistency to the Council prior to implementation of the project. (Wat. Code, § 85225.) Water

Code section 85057.5, subdivision (a), states that a covered action is a plan, program, or project, as defined pursuant to the California Environmental Quality Act (CEQA) in Public Resources Code section 21065, that meets all of the following conditions:

(1) Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh.

(2) Will be carried out, approved, or funded by the state or a local public agency.

(3) Is covered by one or more provisions of the Delta Plan.

(4) Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta

The Delta Reform Act exempts actions within the secondary zone of the Delta that a metropolitan planning organization determines are consistent with its SCS, or alternative planning strategy, and that the State Air Resources Board has determined would achieve regional greenhouse gas emission reduction targets. (Wat. Code, § 85057.5, subd. (b)(4).) MTC/ABAG is the metropolitan planning organization for the San Francisco Bay Area region, which contains portions of the secondary zone of the Delta. Thus, Water Code Section 85057.5, subdivision (b)(4), provides MTC/ABAG with a significant role in shaping the state's Delta policy. Although Plan Bay Area 2050+ is not a covered action, MTC/ABAG should ensure that it is consistent with the Delta Plan, as discussed in greater detail below.

1. Urban Expansion within the Delta

The Council exercises its authority through regulatory policies. (Cal. Code Regs., tit. 23, § 5001 et seq.) One of these policies, Delta Plan Policy **DP P1** (Cal. Code Regs., tit. 23, § 5010.) places certain limits on new urban development within the Delta. New residential, commercial, or industrial development must be limited to areas that city or county general plans designate for that type of development as of the date of the Delta Plan's adoption, May 16, 2013. In Contra Costa County, new residential, commercial, and industrial development within the Delta must be limited to areas within the 2006 voter-approved urban limit line. (Cal. Code Regs.,

tit. 23, § 5010, subd. (a)(2).) This policy is intended to conserve farming and rural land use, protect the unique character of historic Delta communities, and allow for development that supports agricultural and recreation-related economic activities.

The EIR should acknowledge Policy DP P1 in the regulatory setting for the Land Use and Planning section, as well as in the growth inducement discussion. The EIR should document how Plan Bay Area 2050+ is consistent with Policy DP P1 and evaluate whether any of the Growth Geographies, such as Priority Development Areas and Planning Performance Agreements, located within or adjacent to the Delta have the potential to induce residential, commercial, or industrial development that would be inconsistent with DP P1.

The Council also has an interest in recommended transportation projects in Plan Bay Area 2050+ that may induce urban expansion or improve or degrade connections to rural areas and that would be inconsistent with DP P1. The EIR should describe what infrastructure, beyond the recommended transportation projects, is necessary to support the SCS or the plans, programs, projects, or activities encompassed within it. (Wat. Code § 85057.5, subd. (b)(4).)

2. Consistency with Ecosystem Restoration Needs

Water Code section 85212 of the Delta Reform Act requires that the Council's input on local and regional planning documents, including SCSs, include, but not be limited to, reviewing both of the following:

- the consistency of local and regional planning documents with the ecosystem restoration needs of the Delta.

- whether the lands set aside for natural resource protection are sufficient to meet the Delta's ecosystem needs.

The Delta Plan designates six priority habitat restoration areas (PHRAs) that have the greatest potential for large-scale habitat restoration. (Cal. Code Regs., tit. 23, app. 5.) Delta Plan Policy **ER P3** (Cal. Code Regs., tit. 23, § 5007.) requires significant adverse impacts to the opportunity to restore habitat be avoided or mitigated in these areas (Cal. Code Regs., tit. 23, app. 5: http://deltacouncil.ca.gov/sites/default/files/2015/09/Appendix%205.pdf). Four

PHRAs are located partially or wholly within the Plan Bay Area 2050+ planning area: (1) Suisun Marsh; (2) Cache Slough; (3) the southern and western portions of the Yolo Bypass; and (4) the Winter Island and Dutch Slough portions of the Western Delta PHRA. The consistency of Plan Bay Area 2050+ with the ecosystem restoration needs of the Delta is based on the plan's impacts to the opportunity to restore habitat in these PHRAs.

Plan Bay Area 2050+ designates locally nominated Priority Conservation Areas (PCAs), which are lands set aside for protection. The Council supports the proposed PCA designation in Cache Slough, which aligns with the Cache Slough PHRA. The Council also supports two additional proposed PCAs located partially within a Delta Plan PHRA. The Delta Recreation Area PCA covers the Dutch Slough portion of the Delta Plan's Western Delta PHRA, and the Tri-City-County Cooperative Planning Area PCA covers the northwestern corner of the Delta Plan's Suisun Marsh PHRA. These proposed PCAs complement the existing East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan PCA, which covers the Dutch Slough portion of the Delta Plan's Western Delta PHRA.

The Council continues to encourage PCA designations for the entire Suisun Marsh, the southern and western portions of the Yolo Bypass, and Winter Island. In Council staff's opinion, those actions will ensure that the lands set aside for natural resource protection are in the priority locations and at elevations necessary to meet the Delta's ecosystem needs as described in the Delta Plan.

Closing Comments and Next Steps

As MTC/ABAG proceeds with development and environmental impact analysis for Plan Bay Area 2050+, the Council invites MTC/ABAG to continue to engage Council staff to ensure consistency between Plan Bay Area 2050+ and the Delta Plan, to ensure that the two plans are complementary in nature and serve to protect the Delta while promoting sustainable growth and economic vitality in the broader region.

Please contact Eva Bush at Eva.Bush@deltacouncil.ca.gov with any questions.

Sincerely,



Jeff Henderson

Deputy Executive Officer

February 10, 2025

Adam Noelting
Principal Planner
Metropolitan Transportation Commission
375 Beale Street, Suite 800
San Francisco, CA 94105

RE: Notice of Preparation of a Draft Environmental Impact Report for Plan Bay Area 2050+ (Regional Transportation Plan/Sustainable Communities Strategy for the Nine County San Francisco Bay Area)

Dear Mr. Noelting:

Bay Area Air Quality Management District (Air District) staff have reviewed the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050+ Regional Transportation Plan/Sustainable Communities Strategy for the Nine County San Francisco Bay Area (Project). The Project is designed to serve as the 2025 Regional Transportation Plan/Sustainable Communities Strategy for the San Francisco Bay Area. It is a limited and focused update to the region's long-range plan to guide the growth of the nine-county San Francisco Bay Area. The Project will focus on four key elements—transportation, housing, the economy, and the environment—and will identify a path to make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. It refines select plan strategies to integrate the lessons of the last three years and will enable continued progress implementing the strategies of Plan Bay Area 2050.

Recommendations

Particulate Matter Emissions

The United States Environmental Protection Agency (EPA) revised the Primary Annual Particulate Matter [2.5 micron] ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS) to 9.0 µg/m^3. Based on existing data, the Air District anticipates a nonattainment designation for the region which will trigger significant planning requirements, including updates to the region's $PM_{2.5}$ budget and baseline inventory for the purposes of Transportation Conformity Determinations and State Implementation Plan approval.

The Air District strongly recommends the DEIR incorporates road dust in the analysis of operational emissions to ensure consistency with the upcoming moderate nonattainment Transportation Conformity Determination and the State Implementation Plan requirements. Further information on evaluating mobile sources and road dust can be found in Appendix E of the Air District's California Environmental Quality Act (CEQA) Guidelines "Recommended Methods for Screening and Modeling Local Risks and Hazards".

Additionally, the California Air Resources Board (CARB) plans to release EMFAC2025 with updates and improvements to the current model, EMFAC2021. The Air District recommends Metropolitan Transportation Commission (MTC) consult with CARB to ensure the DEIR reflects the most recent version of EMFAC2025.

Environmental Justice and Equity

Title VI of the Civil Rights Act of 1964, along with its state law analog (Gov. Code section 11135), prohibits recipients of federal (and state) funds from causing a disparate impact on protected classes of people. Under both state and federal law, those protected classes include race. (Id.; 42 U.S.C. section 2000d). The Air District acknowledges the important work that the MTC has already completed in conducting Title VI and Environmental Justice Analysis in the Plan Bay Area 2050's Equity Analysis Report and urges MTC to continue addressing disparate impacts and

advancing equitable outcomes. To accurately reflect the equity-focused populations and geographies in the region, the Air District recommends including Overburdened Communities instead of Community Air Risk Evaluation (CARE) Communities in the Project's equity and DEIR analyses, as shown on the Air District's Overburdened Communities Map.

Overburdened Communities, as defined by the Air District's Regulation 2, Rule 1: General Requirements[1] typically experience higher health impacts from pollution exposure, including exposure to transportation sources. Because of the potential impact to surrounding communities, the Air District strongly urges MTC staff to apply Environmental Justice principles as defined in Chapter 2 of the Air District's California Environmental Quality Act (CEQA) Guidelines entitled, "Best Practices for Centering Environmental Justice (EJ), Health, and Equity" to this Project. The Air District is available to provide technical support and assistance to help advance EJ, health, and equity efforts during the environmental review process.

If you have any questions or would like to discuss Air District recommendations further, please contact Alesia Hsiao, Principal Environmental Planner, ahsiao@baaqmd.gov.

Sincerely,

Greg Nudd
Deputy Executive Officer of Science and Policy

[1] Bay Area Air Quality Management District. Regulation 2, Rule 1: General Requirements. https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20211215_rg0201-pdf.pdf?rev=103cc60e706947d3ad1e4f5a090483c1

Santa Clara Valley Transportation Authority

February 12, 2025

MTC Public Information
375 Beale Street, Suite 800
San Francisco, CA 94105

Attn: Veronica Cummings
Via Email: eircomments@bayareametro.gov

Subject: Notice of Preparation for the Draft Environmental Impact Report for Plan Bay Area 2050+

Dear Veronica Cummings:

Thank you for the opportunity to review the Notice of Preparation for the Draft EIR for Plan Bay Area (PBA) 2050+. The Santa Clara Valley Transportation Authority (VTA) offers the following comments.

Federal Funding Impacts

With the new federal Administration in place and recent federal funding freezes, PBA 2050+ should include an alternative scenario that accounts for a reduction in federal revenue. The uncertainty surrounding federal funding programs creates the potential for project delays or cancellations.

The current PBA 2050+ framework may also face challenges in meeting CARB's greenhouse gas reduction targets. Given the evolving federal policies and potential funding constraints, there should be an opportunity to collaborate with CARB to reassess and adjust these targets to ensure they remain realistic and achievable.

Support for Community-Led Transportation Plans

VTA recommends retaining the strategy to *support community-led transportation enhancements in Equity Priority Communities,* as included in Plan Bay Area 2050. With MTC funding, VTA has developed six Community-Based Transportation Plans that have successfully brought together residents, community organizations, and transportation agencies to identify and address transportation challenges in low-income neighborhoods. PBA 2050+ should emphasize the importance of sustaining these efforts and their role in improving transportation equity in historically marginalized communities.

Focus on Security, Safety, and Cleanliness

VTA supports the increased focus on security, safety, and cleanliness on transit. Prioritizing these improvements will be essential for increasing ridership and ensuring that the system is welcoming and reliable for all users.

If you have any questions or comments, you may reach me at 408-321-5804 or larissa.sanderfer@vta.org.

Sincerely,

Larissa Sanderfer
Transportation Planner

CC: Rahul Sighamony, VTA
MTC2501

LIVERMORE
CALIFORNIA

February 12, 2025

Metropolitan Transportation Commission
Association of Bay Area Governments

Subject: Draft Environmental Impact Report for Plan Bay Area 2050+

Dear Mr. Noelting:

Thank you for the opportunity to provide comments on the scope and content of the environmental impact assessment that will be conducted for the long-range regional plan for transportation, housing, the economy and the environment known as Plan Bay Area 2050+. The City received your letter and Notice of Preparation, dated January 14, 2025.

The City understands Plan Bay Area 2050+ will be evaluated through an Environmental Impact Report (EIR) in accordance with CEQA. Based on our review of the Notice of Preparation, the Draft Blueprint Strategies and Growth Geographies, the City does not have substantial comments regarding scope of study at this time. We do recommend that ABAG/MTC consider a project alternative described below.

There are four Transit Oriented Community (TOC) Areas in Livermore at the existing Vasco and First Street Altamont Corridor Express (ACE) Stations and planned Midtown and Isabel Valley Link Stations. There are two Priority Production Areas (PPAs) on the west and eastern ends of the city, which support our industrial sector and facilitates a significant number of jobs. In addition, three Priority Development Areas (PDAs) identified in Plan Bay Area 2050 are in Livermore:

1. Isabel Neighborhood
2. Downtown Livermore
3. Southfront PDA (known as Midtown Area)

The City has adopted and is currently implementing the Isabel Neighborhood Specific Plan, which contemplates 4,000 housing units, access to the future Valley Link regional rail, commercial retail and community services. Similarly, the Downtown Livermore Specific Plan has facilitated a mixed-use environment served by the ACE regional commuter rail. Currently, the City is preparing a comprehensive General Plan Update and EIR, which explores future development of the Midtown Area (Southfront PDA). If approved, the Midtown Area could transition into a mixed-use neighborhood with access to regional rail and jobs. The Midtown Area would likely be developed through a future Specific Plan.

City Hall 1052 South Livermore Avenue Livermore, CA 94550
phone: (925) 960-4000
fax: (925) 960-4058
TDD: (925) 960-4104
www.ci.livermore.ca.us

Livermore shares MTC/ABAG's goal to facilitate the production and provision of housing. Through comprehensive planning, Livermore has strategically planned residential densities to support transit ridership near existing and future rail stations and to link the community to services and amenities. However, under local market conditions, the residual land values and economic limitations often make higher densities infeasible to construct.

Based on our experience and understanding of the local development community, Livermore recommends that MTC/ABAG consider and evaluate a project alternative that contemplates a density range and parking requirements appropriate to the local context and the existing built environment. Such an alternative may be considered more economically feasible within the Livermore PDAs and TOC areas (and possibly other communities outside the Bay Area Core). We recognize that market factors may change over time as costs decrease or demand increases. The intent of our recommendation is to understand the feasibility of housing development under current and foreseeable conditions in the preparation of and consistency with the Livermore General Plan, EIR and our subsequent environmental documents.

Please continue to inform Livermore regarding the EIR process and any other CEQA related notices and documents. If you have any questions or would like to discuss, feel free to contact me at the email below or at (925) 960-4461.

Respectfully,

Steve Riley

Steve Riley
Planning Manager
City of Livermore
1052 S. Livermore Ave
Livermore, CA 94550 1052
(925) 960-4461
spriley@livermoreca.gov

Cc: Brent Smith, Community Development Director
Brandon Cardwell, Innovation & Economic Development Director
Andy Ross, Principal Planner
Emily LaDue, Assistant Planner

Yingying Cai

From: Adam Noelting <ANoelting@bayareametro.gov>
Sent: Friday, February 14, 2025 11:46 AM
To: Kari Zajac
Cc: Yingying Cai
Subject: Fw: Plan Bay Area 2050+ DEIR

FYI, we received this comment this morning.

From: Gonzalez, Angelica, CDA <Angelica.Gonzalez@acgov.org>
Sent: Friday, February 14, 2025 10:02 AM
To: EIR Comments <eircomments@bayareametro.gov>
Subject: NOP: Plan Bay Area 2050+ DEIR

You don't often get email from angelica.gonzalez@acgov.org. Learn why this is important
External Email

Good Morning,

Thank you for the opportunity to review and comment on the Plan Bay Area 2050+ DEIR. Planning staff would like to offer comments and recommend that it should also continue to evaluate an alternative that considers growth in Equity Priority Communities or outside existing job centers. We also recommend excluding high and very high fire severity areas from growth consideration to enhance public safety and resilience.

If you have any questions, please feel free to contact me.

Thank You,

Angelica P. González | Senior Planner
ALAMEDA COUNTY PLANNING DEPARTMENT | Community Development Agency | Policy Planning & Research Team
angelica.gonzalez@acgov.org | Office: 510-670-6524 | www.acgov.org/cda
224 W. Winton Avenue, Room 111 | Hayward, CA 94544

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From: EIR Comments <eircomments@bayareametro.gov>
Sent: Tuesday, January 14, 2025 3:37 PM
Subject: Notice of Preparation: Plan Bay Area 2050+ DEIR

NOTICE OF PREPARATION (NOP)

To: Interested Agencies, Organizations and Individuals

Project: Draft Environmental Impact Report for Plan Bay Area 2050+ *(Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area)*

Lead Agencies: Metropolitan Transportation Commission/Association of Bay Area Governments

Comment Period: January 14, 2025 – February 13, 2025 (30 days)

Interested agencies, organizations and individuals are invited by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) to comment on the scope and content of the environmental impact assessment that will be conducted for the long-range regional plan for transportation, housing, the economy and the environment known as *Plan Bay Area 2050+*. A map of the nine-county area addressed in the plan is included in this notice as Figure 1.



Figure 1. Nine-County San Francisco Bay Area

MTC and ABAG are the joint lead agencies undertaking preparation of a program-level Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050+. Plan Bay Area 2050+ is designed to serve as the 2025 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the San Francisco Bay Area. In addition to the focus on transportation and land use, Plan Bay Area 2050+ incorporates economic and environmental issues into the plan; taken as a package, the plan identifies a suite of integrated strategies that will enable the Bay Area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges. The plan also identifies regional transportation planning needs, priorities and funding, and allows project sponsors to qualify for federal funding for public transit, streets and roads, and bicycle and pedestrian facilities. Although not required by law, the plan further identifies needs and revenues for affordable housing, environmental resilience, and economic development as a best practice.

Plan Bay Area 2050+ seeks to ensure that the Bay Area is more affordable, connected, diverse, healthy, and vibrant for all by the year 2050. It also seeks to meet or exceed state and federal planning requirements, including a state-mandated year 2035 target for greenhouse gas emissions reduction. The plan is required to be updated every four years. Attachment A to this NOP provides more information on MTC, ABAG, SB 375 and Plan Bay Area 2050+.

In accordance with the California Environmental Quality Act (CEQA) Guidelines (Section 15082), the purpose of this Notice of Preparation is to seek comments about the scope and content of the

environmental impact report that will be prepared for Plan Bay Area 2050+. EIRs are prepared to inform decision makers and the public about the potential physical environmental impacts associated with changes to the environment that may result if a project is approved. If you represent an agency that may rely upon the EIR for project approval and/or tiering, MTC and ABAG are particularly interested in what information may be helpful for these purposes. Input is also sought from organizations and individuals as to the issues that should be addressed in the EIR.

Adoption and implementation of Plan Bay Area 2050+ has the potential to result in environmental effects in all the environmental impact areas identified in CEQA. For this reason, the Plan Bay Area 2050+ EIR will be a "full scope" document and will analyze all the required CEQA environmental issue areas. These include: aesthetics; agriculture and forestry resources; air quality; biological resources; cultural resources; energy; geology and soils; greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality; land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation/traffic; tribal cultural resources; utilities and other service systems; and wildfire. The EIR will also address cumulative effects, growth inducing impacts and other issues required by CEQA.

MTC and ABAG would be particularly interested in hearing your views on the following questions:

1. Are there any alternatives you believe MTC/ABAG should evaluate?

2. What types of mitigation measures do you think would help avoid or minimize potential environmental effects?

All interested agencies, organizations and individuals are invited to attend a scoping meeting webinar providing an overview of the EIR scope and/or submit comments on the project. The scoping meeting for Plan Bay Area 2050+ will be held on January 29, 2025, at 1:00 p.m. The meeting will be held virtually at the following Zoom link: https://bayareametro.zoom.us/j/84828971011?pwd=HawKgsJQFLsnvgkUSLGxMvThkEzhfg.FyEx6Dpdgt21yXRV

If you choose to phone in for audio only, please dial 1-877-853-5247 and enter Webinar ID: 848 2897 1011 and Passcode: 812438.

Written comments are also being accepted via email to eircomments@bayareametro.gov; via mail to MTC Public Information, Attn: Veronica Cummings, 375 Beale Street, Suite 800, San Francisco, CA, 94105; or via fax to 415.536.9800. **All written comments must be received no later than February 12, 2025.** For more information, call the MTC Public Information Office at 415.778.6757.

Do you need an interpreter or any other assistance to participate? Please call 415-778-6757. We require at least three working days' notice to provide reasonable accommodation. For TDD or hearing impaired, call 711, California Relay Service, or 1-800-735-2929 (TTY), 1-800-735-2922 (voice) and ask to be relayed to 415-778-6700.

¿Necesita un intérprete u otra asistencia para participar? Por favor llame al 415-778-6757. Solicitamos tres días hábiles para poder coordinar servicios de interprete. Para servicios de TDD o para sordomudos, favor de llamar al 711 al Servicio de Retransmisión de California o al 1-800-735-2929 (para TTY) o al 1-800-735-2922 (para voz) y pida que lo conecten al 415-778-6700.

您是否需要翻譯員或任何其他幫助才能參加呢？請提前三天致電415-778-6757. 有聽覺或者语言障碍的人士, 请打电话到711, 加州传达服务. 电传打字机的联系号码是1-800-735-2929, 需要语音服务可以打电话到1-800-735-2922, 然后要求传达到 415-778-6700.

Veronica C. Cummings
Principal Public Information Officer, Engagement
VCummings@bayareametro.gov

BAY AREA METRO | BayAreaMetro.gov
Association of Bay Area Governments
Metropolitan Transportation Commission
Bay Area Metro Center | 375 Beale Street | Suite 800
San Francisco, CA 94105
O: (415) 778-6775

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PLANNING & DEVELOPMENT SERVICES
250 Hamilton Avenue, 5th Floor
Palo Alto, CA 94301
(650) 329-2442

February 27, 2025

Attn: Adam Noelting, Principal Planner
Metropolitan Transportation Commission
375 Beale Street, Suite 800
San Francisco, CA 94105

Subject: Plan Bay Area 2050+ NOP Request for Comments

Dear Mr. Noelting,

I am writing in response to your requests for comments on the Notice of Preparation of a Draft Environmental Impact Report (EIR) for the Plan Bay Area 2050+. We recognize that the official deadline for comments was January 13, 2025, however we are also aware that the process to prepare an EIR is a long one during which there are multiple opportunities for public comment.

At this time, the City believes that to understand the impacts of this project on the City of Palo Alto, we would need to see analysis based on jurisdiction boundaries. It is our understanding that the data is currently based on TAZ/MAZ, which do not align with City boundaries.

Please note that this request for jurisdiction-level data is a request that has been made before, including as part of a comment letter dated January 21, 2021.

If you have any questions or wish to discuss this further, please contact me.

Sincerely,

Jennifer Armer, AICP
Assistant Director
Planning & Development Services Department
(650) 329-2191 | jennifer.armer@cityofpaloalto.org

SPRAWLDEF

Sustainability, Parks, Recycling And Wildlife Legal Defense Fund

802 Balra Drive, El Cerrito, CA 94530
510 526-4362 www.sprawldef.com n.laforce@comcast.net

February 11, 2025

MTC Public Information

Attn: Veronica Cummings,

eircomments@bayareametro.gov

375 Beale Street, Suite 800

San Francisco, CA, 94105

RE: Scoping Comments for Environmental Impact Report for Plan Bay Area 2050+

SPRAWLDEF makes the following comments on the NOP for the EIR for the Plan Bay Area 2050+. SPRAWLDEF is a environmental non-profit focused on protecting habitat and wildlife and recently won a major legal victory decertifying the SEIR for the proposed development at Point Molate, resulting to the voiding of the entire Land Development and general plan and zoning amendments for that project. The site will now become a regional park.

We are appreciative that PBA 2050+ is now recognizing the need to address environmental issues by proposing a new "Plan Bay Area 2050+ Environment Element" in its Blueprint Strategies. However, this Strategy fails to address and incorporate into the Blueprint the San Francisco Bay Conservation and Development Commission's (BCDC) recently adopt(December 2024), and incorporated into the Bay Plan, its Regional Shoreline Adaptation Plan (RSAP) as required by the passage of SB 272 (Laird). This action included the RSAP's Subregional Shoreline Adaptation Plan Guidelines that every local shoreline government (and county) must develop and submit for approval by BCDC by 2034. The RSAP and SSAP provide the directives for those communities on how to adapt to rising sea level (SLR). Thus, EN1 should identify the RSAP/SSAPs as the means by which communities should decide how to address SLR. Failing to do this, the EIR should evaluate the possible impacts to Bay habitats and to associated shoreline communities if there is a discrepancy between what is required in the SSAP Guidelines and what

might be built along the shoreline using only local planning zoning regulations that were developed prior to SB 272 and were designed only to meet PBA 2050 requirements such as developing PDAs or utilizing existing PDAs.

For example, many local communities have proposed or approved Priority Development Areas (PDAs) on the shoreline. How will this correlate with the need to now development SSAPs for the same areas (since as PDAs they are not yet fully developed or possibly development has not even started). It is likely that the PDA local zoning requirements are different from the SSAP Guidelines. The potential differences between zoning and SSAP could result in the destruction of adjacent shallow water habitats such as tidal marshes, mudflats, beaches and submerged aquatic vegetation such as eelgrass. This could happen if, for example, the PDA is not yet developed and the SSAP recommends setting back the development from the shoreline to allow for ecotone levees or other natural or nature-based solutions. A local government would have to decide which to follow, the PDA or the SSAP.

The EIR should discuss the potential impacts to the Bay habitats if the PDA scenario was followed by some communities rather than the SSAP. After all, shoreline PDAs were not developed for the most part with SLR in mind and certainly not with the clear attention to environmental needs found in the RSAP/SSAP. Recognizing from a recent study that hard edged seawalls can redirect wave energy not only onto adjacent shorelines but even distant Bay shorelines the potential impacts may be large.

The EIR should analyze whether if PDAs were required to apply SSAP standards to all future planning that the impacts described above would be reduced or eliminated. The EIR would need to propose mitigations for these impacts, many of which may not mitigable.

Similarly, the new revisions to Priority Conservation Areas (PCAs) should be recognized in the Blueprint strategies and the failure to do so should be evaluated in the EIR. It is our understanding that PCAs will now be allowed within shoreline PDAs.

In addition, every Strategy in the 2050+ Blueprint should recognize the RSAP/SSAP requirements as should the PDA program. The failure to do so will almost certainly result in significant impacts to shoreline, shallow water habitats. The EIR should analyze these potential impacts and suggest mitigation measures including avoidance.

For example, under the **Transportation Element:**

Both **T6**, **Modernize Freeways and Interchanges**, and **T7**, **Expand Freeways and**

Mitigate Impacts provide opportunities for adapting to sea level rise at those locations that are predicted to face inundation due to SLR. The failure to implement the SSAP Guidelines in the design process will likely result in impacts to shoreline habitats. Failure to follow the SSAPs could lead to decisions to implement mitigations that do not address the SLR adaptation issue in a manner consistent with the SSAPs, for example by ignoring the potential regional impacts of the project. The RSAP process is, of course, based on a regional, as well as local, approach in identifying impacts and adaptations. The EIR should analyze the potential for significant impacts

Resulting from this.

Both **T11**, **Enhance Transit Frequency, Capacity and Reliability,** and **T12**, **Expand Transit Services throughout the Region** similarly provide opportunities to adapt to SLR fi the SSAP Guidelines are utilized in the planning process. Absent that, significant impacts to shoreline habitats are likely to occur as noted above.

Under the **Housing Element:**

H4 Build Adequate Affordable Housing to Ensure Homes for All encourages new housing. Failure to incorporate SSAP Guidance into the planning for this housing may result in housing subject to flooding and/or inundation due to SLR as well as significant impacts to shoreline habitats.

Under this program MTC/ABAG has identified **Growth Geographies** and established a **PDA** program. Both programs should recognize the RSAP/SSAP and modify the program so as to ensure compliance with the RSAP/SSAP. Absent that, both programs may encourage local communities to ignore or put off implementing SSAPs while continuing to use current zoning to develop new housing projects under the Growth Geographies and PDA mechanisms. The EIR should analyze how the failure to incorporate the RSAP/SSAP program into Growth Geographies and PDAs programs may result in significant impacts to both communities and shoreline habitats.

Under the **Economy Element:**

The Growth Geographies and PDA issue again requires an RSAP/SSAP acknowledgement in order to avoid the community (flooding and inundation) and shoreline habitat (drowning of shallow water habitats, erosion of habitats, etc.) impacts that may result from SLR and the failure to follow the SSAP Guidelines so as to avoid those impacts. The following Economic elements all entail potential new shoreline development or the expansion of existing shoreline development that

may lead to the impacts described above. The EIR must analyze the potential for such impacts as a result of the failure to recognize and plan consistent with the SSAP Guidelines.

EC4 Allow a Greater Mix of Land Uses and Densities in Growth Geographies
EC5 Provide Incentives to Employers to Locate in Low-VMT Areas
EC6 Provide Incentives to Employers to Locate in Low-VMT Areas

Under the **Environment Element**:

EN1 Adapt to Sea Level Rise, fails to recognize the adoption of the RSAP/SSAP as part of the BCDC Bay Plan (thus a legal requirement). While much of the descriptive text in EN1 is good, that lack renders EN1 inadequate for the avoidance of local and regional SLR impacts to shoreline habitats and to the local communities since EN1 has no regional perspective (again, hard shorelines in one location may impact immediately adjacent shoreline communities as well as distant shoreline communities. The EIR should address this issue and determine potential impacts that result from the failure to incorporate the RSAP/SSAP program into the PBA 2050+ Blueprint and PBA 2050+./

To conclude, all elements of Plan Bay Area 2050+ Blueprint and the full PBA 2050+ should require any proposed new development upon the shoreline to wait until the local community can develop and have approved by BCDC a SSAP. Failure to do so threatens a regional approach to SLR which may have significant impacts locally and regionally to communities and to the Bay itself. The EIR must analyze the potential impacts such a situation.

Sincerely yours,

Norman La Force
Norman La Force,

President & General Counsel

February 12, 2025

MTC Public Information
Attn: Veronica Cummings,
375 Beale Street, Suite 800
San Francisco, CA, 94105

RE: Scoping Comments for Environmental Impact Report for Plan Bay Area 2050+

We are appreciative that PBA 2050+ is now recognizing the need to address environmental issues by proposing a new "Plan Bay Area 2050 + Environment Element" (EN1) into its Blueprint Strategies. However, this Strategy fails to address and incorporate into the Blueprint the San Francisco Bay Conservation and Development Commission's (BCDC) recent adoption (December 2024) and incorporation into the Bay Plan of its Regional Shoreline Adaptation Plan (RSAP) as required by the passage of SB 272 (Laird). This action included the RSAP's Subregional Shoreline Adaptation Plan (SSAP) Guidelines that every local shoreline government (and county) jurisdiction must use to develop its own Subregional Shoreline Adaptation Plan and then submit it to BCDC for approval by 2034.

The RSAP and SSAP Guidelines provide directives for all shoreline jurisdictions on how to adapt to rising sea level (SLR). Thus, EN1 should identify the RSAP/SSAPs as establishing the standards by which jurisdictions should address SLR. The EIR should evaluate the possible impacts to Bay habitats and to associated shoreline jurisdictions if the RSAP/SSAP Guidelines are not cited in PBA 2050+ and Blueprint because significant environmental community impacts, both direct and indirect may result due to potential discrepancies between what kinds of development and adaptation strategies local jurisdictions may approve based on an approved SSAP and what may be approved using only local planning zoning regulations and other local ordinances that were developed prior to SB 272 and were designed only to meet PBA 2050 requirements such as developing new PDAs or utilizing existing PDAs.

For example, many local jurisdictions have proposed or approved Priority Development Areas (PDAs) on the shoreline. How will the PDA's zoning designations and ordinances correlate with the new need to develop SSAPs for the same areas (since as PDAs they are not yet fully developed or possibly development has not even started). It is likely that the PDA's local zoning and other ordinance requirements will differ from the SSAP Guidelines. The potential

differences between such zoning and an SSAP could result in the destruction of adjacent shallow water habitats such as tidal marshes, mudflats, beaches and submerged aquatic vegetation such as eelgrass. As is becoming well known, hard shoreline edges, such as seawalls, deflect tidal wave energy and this can lead to the erosion of outboard shallow water aquatic habitats. Equally, such deflections are also lateral and one protected shoreline can mean a highly vulnerable shoreline in an adjacent community will be subjected to intensive erosive energies. The EIR must analyze the potential for these impacts if the need for an approved SSAP is not incorporated into PBA 2050+ and Blueprint.

If this inclusion does not occur then, for example, if a PDA is not yet built up but is planned for development right to the shoreline while an approved SSAP recommends setting back the development from the shoreline, a local government would have to decide which to follow, the PDA or the SSAP. The EIR should make clear the potential impacts of this decision-making and suggest feasible mitigations.

The EIR should discuss the potential impacts to the Bay habitats if the PDA scenario was followed by some communities rather than the SSAP. After all, shoreline PDAs were not developed for the most part with SLR in mind and certainly not with the clear attention to environmental needs found in the RSAP/SSAP. For example, a recent study* found that hard edged seawalls can redirect wave energy not only onto adjacent shorelines but even distant Bay shorelines. Consequently, the potential impacts may be not only local but regional and even more significant.

The EIR should analyze whether PDAs are required to apply SSAP standards to all future planning, and if so, whether the impacts described above would be reduced or eliminated. The EIR would need to propose mitigations for these impacts, many of which may not be mitigatable.

Similarly, the new revisions to Priority Conservation Areas (PCAs) should be recognized in the Blueprint strategies and the consequences of failing to do so should be identified and analyzed within the EIR. It is our understanding that PCAs will now be allowed within shoreline PDAs and that regional PCAs will be identified, although local jurisdictions will not be required to utilize them. The EIR should analyze how the failure to incorporate PCA's into the Blueprint (especially EN1) may result in significant impacts to shoreline habitats as well as local communities. PCAs can provide the opportunity to avoid shoreline development that will soon be either experiencing significant flooding or even inundation.

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*JGR OCEANS Research Article
Assessing the Influence of Shoreline Adaptation on Tidal Hydrodynamics: The Role of Shoreline Typologies
Michelle A. Hummel Mark T. Stacey First published: 29 December 2020

Similarly, many Strategies in the 2050+ Blueprint should recognize the RSAP/SSAP requirements as should the PDA program. Any failure to do so will almost certainly result in significant impacts to shoreline shallow water habitats. The EIR should analyze these potential impacts and suggest mitigation measures including avoidance.

For example, under the **Transportation Element:**

Both **T6**, **Modernize Freeways and Interchanges**, and **T7**, **Expand Freeways and Mitigate Impacts** provide opportunities for adapting to sea level rise at all locations that are predicted to face inundation due to SLR. Any failure to implement the SSAP Guidelines in the design process will likely result in impacts to shoreline habitats. Failure to follow the SSAPs could lead to decisions to implement mitigations that do not address the SLR adaptation issue in a manner consistent with the SSAPs, for example by ignoring the potential regional impacts of the project. The RSAP process is, of course, based on a regional, as well as local, approach in identifying impacts and adaptations. The EIR should analyze the potential for significant impacts resulting from this.

Both **T11**, **Enhance Transit Frequency, Capacity and Reliability,** and **T12**, **Expand Transit Services throughout the Region** similarly provide opportunities to adapt to SLR if the SSAP Guidelines are utilized in the planning process. Absent that, significant impacts to shoreline habitats are likely to occur as noted above and this should, again be analyzed in the EIR.

Under the **Housing Element:**

H4 Build Adequate Affordable Housing to Ensure Homes for All encourages new housing. Failure to incorporate SSAP Guidance into the planning for this housing may result in housing subject to flooding and/or inundation due to SLR in areas that existing mapping may already identify as being vulnerable to sea level and groundwater rise under the proposed 4.9' of sea level rise, as well as significant impacts to shoreline habitats, perhaps with local and regional effects as well. The EIR should analyze these potential impacts, both direct and indirect.

Under this program MTC/ABAG has identified **Growth Geographies** and established a **PDA** program. Both programs should recognize the RSAP/SSAP and modify each program so as to ensure compliance with the RSAP/SSAP. Absent that, both programs may encourage local jurisdictions to ignore or put off implementing SSAPs while continuing to use current zoning to develop new housing projects under the Growth Geographies and PDA mechanisms. The EIR should analyze how any failure to incorporate the RSAP/SSAP program into Growth Geographies and PDA programs may result in significant impacts to both jurisdictions and shoreline habitats.

Under the **Economy Element:**

The Growth Geographies and PDA issues again require an RSAP/SSAP acknowledgement in order to avoid the flooding and inundation of local and county jurisdictions and damage to shoreline habitat (drowning of shallow water habitats, erosion of habitats, etc.) that may result from SLR and the failure to follow the SSAP Guidelines so as to avoid those impacts. The following Economic elements all entail potential new shoreline development or the expansion of existing shoreline development that may lead to the impacts described above. The EIR must analyze the potential for such impacts as a result of the failure to recognize and plan consistent with the SSAP Guidelines.

EC4 Allow a Greater Mix of Land Uses and Densities in Growth Geographies
EC5 Provide Incentives to Employers to Locate in Low-VMT Areas
EC6 Provide Incentives to Employers to Locate in Low-VMT Areas

Under the **Environment Element**:

EN1 Adapt to Sea Level Rise, fails to recognize the adoption of the RSAP/SSAP as part of the BCDC Bay Plan (thus becoming a legal requirement). While much of the descriptive text in EN1 is good, that omission renders EN1 inadequate for avoiding local and regional SLR impacts to shoreline habitats and to the local jurisdictions, since EN1 has no regional perspective (again, hard shorelines in one location may impact the immediate adjacent shoreline jurisdictions as well as distant shoreline jurisdictions. The EIR should address this issue and determine potential impacts that would result from the failure to incorporate the RSAP/SSAP program into the PBA 2050+ Blueprint and PBA 2050+.

To conclude, all elements of Plan Bay Area 2050+ Blueprint and the full PBA 2050+ should require any proposed new development upon the shoreline to wait until the local jurisdictions can both develop and obtain BCDC approval for their RSAP/SSAP proposals. Failure to do so threatens the legislatively mandated regional approach to SLR. In turn, inadequate or variable planning perspectives may have significant impacts locally and regionally to other jurisdictions and to the Bay itself. The EIR must analyze the potential impacts of such situations.

Sincerely yours,
Arthur Feinstein, chair
Sierra Club, Bay Alive Campaign

Citizens Committee to Complete the Refuge

P.O. Box 23957, San Jose, CA 95153 Tel: 650-493-5540 Email: cccrrefuge@gmail.com www.bayrefuge.org

Sent via electronic mail only
MTC Public Information
Attn: Veronica Cummings
375 Beale Street, Suite 800
San Francisco, CA, 94105

February 13, 2025

Re: Notice of Preparation for a Draft Environmental Report for Plan Bay Area 2050+
(Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area)

Dear Ms. Cummings,

The Citizens Committee to Complete the Refuge appreciates the opportunity to provide scoping comments for the Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050+ (PBA 2050+). According to the Notice of Preparation (NOP), PBA 2050+ DEIR is meant to support the environmental review for the 2025 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the nine Bay Area counties, which focuses on transportation and land use. PBA 2050+ will also incorporate economic and environmental issues into the plan. We applaud the incorporation of updates to the Environmental Element Section, such as increasing the projected sea level rise estimate from 3' to 4.9' by 2050, but remain concerned that the measures proposed are inadequate to address the challenges and threats posed by sea level and groundwater rise for our shoreline communities and for the ecological health of the Bay. Our scoping comments are based upon the information contained in the NOP and the attachments referenced in the NOP and scoping email notification.

The Citizens Committee to Complete the Refuge (CCCR) has a long-standing interest in the protection, restoration, and acquisition of San Francisco Bay wetlands; as such the focus of our comments is on biological resources and in particular on the interface of Plan Bay Area 2050+ with lands along the edges of San Francisco Bay.

CCCR was originally formed in 1965 by a group of citizens who became alarmed at the degradation of the Bay and its wetlands. We joined together, and with the support of Congressman Don Edwards, requested that Congress establish a wildlife refuge. The process took seven long years and in 1972 legislation was passed to form the San Francisco Bay National Wildlife Refuge, the first national wildlife refuge in an urban area. In 1988, Congress authorized expansion of the refuge boundary to potentially double the original size. Our membership is approximately 1,500 people and we have the support of local and national organizations-- including open space advocates, environmental groups and hunters.

Our organization has taken an active interest in the protection of the baylands of San Francisco Bay, the health and biodiversity of San Francisco Bay ecosystems, protection of wetlands and endangered species and the habitats that support them, the watersheds that support Bay ecosystems and public education regarding the value of these resources.

CCCR has been an active stakeholder in previous iterations of Plan Bay Area, the Priority Conservation Area Program (PCA), and the San Francisco Bay Conservation and Development's (BCDC) Adapting to Rising Tides and Bay Adapt processes, and served on the Advisory Group of BCDC's development of Guidelines for the Regional Shoreline Adaptation Plan (RSAP) program.

Pertinent to the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) statement that this is a plan that "identifies a suite of integrated strategies that will enable the Bay area to accommodate future growth and make the region more equitable and resilient in the face of unexpected challenges," the critical role the region's baylands play in providing climate resilience and providing strategies that can benefit our communities and economy, must be recognized and must be incorporated into Plan Bay Area 2050+. The focus of our comments center on the analyses that may identify impacts to biological resources or climate change resilience, with a focus on the Bay shoreline.

1. <u>Program-level Draft Environmental Impact Report (DEIR):</u>

The NOP states, "MTC and ABAG are the joint lead agencies undertaking preparation of a program-level Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050+."

a. The PBA 2050+ DEIR should clarify the extent to which it is anticipated local planning entities and agencies will be able to "tier" off the DEIR for future California Environmental Quality Act (CEQA) environmental reviews, if at all.
b. The DEIR should identify if there are situations under which a local planning entity or agency could rely upon the programmatic DEIR such that the public and regulatory and resource agencies might be precluded from reviewing and commenting on projects identified through the PBA 2050+ process (e.g. through the use of an exemption or EIR addendum).

2. <u>Incorporation of BCDC's Regional Shoreline Adaptation Plan (RSAP) Guidelines Into the Identification and Analysis of Impacts, Avoidance and Minimization of Impacts and Mitigation Measures</u>

In response to the language of Senate Bill 272, in December 2024, BCDC approved adoption of a Regional Shoreline Adaptation Plan for the San Francisco Bay Area to address the crucial need for shoreline communities to address the threats of rising sea levels and groundwater that threaten communities and natural habitats of the Bay. SB 272 requires that by 2034, all local governments submit to BCDC for approval, Subregional Shoreline Adaptation Plans (SSAPs) that identify vulnerabilities that exist or will exist for the built and natural environment of their jurisdiction, and propose strategies that will provide climate change resilience. The RSAP Guidelines provide the overarching regional and subregional framework for shoreline communities that includes consideration of the impacts of shoreline growth on the ability to provide sea level rise and groundwater rise resilience for the natural and built environment. The RSAP Guidelines require a holistic description of the built and natural shoreline environment, threats posed, and assessment of, and identification of resilience strategies. The RSAP Guidelines establish minimum standards that must be considered in adaptation planning. The required holistic review of climate resilience crosses a variety of land use and CEQA "Environmental Issue Areas" (e.g. biological, cultural, hazards, hydrology and water quality, etc.); therefore, we urge the following:

a. The DEIR should include in the DEIR Introduction, under the section of the chapter that describes federal and state requirements, information that describes Senate Bill 272 and the RSAP Guidelines, as the RSAP sets the regional and subregional framework within which shoreline communities should develop strategies that provide resilience for the built and natural environment. The RSAP Guidelines provide an overarching framework for shoreline communities

that includes consideration of the impacts of shoreline growth on the ability to provide sea level rise and groundwater rise resilience for the natural and built environment.

b. The DEIR description should include (summarizes) the elements to be considered in an SSAP/RSAP, Plan requirements, and the minimum standards identified for an SSAP/RSAP as these required elements will have a bearing on local government decisions regarding growth and adaptation strategies.
c. The DEIR should describe how the PBA 2050+ will ensure consistency with BCDC's RSAP Guidelines and regional vision for sea level rise resilience for the natural and built environments.

3. **Growth Geographies Mapping**

The level of resolution available in the pdf versions of the Growth Geography mapping is insufficient.

a. The DEIR should provide a hyperlink for the Growth Geography mapping similar to that provided by the online Plan Bay Area 2050 Growth Geographies webpage, to enable decision-makers and the public to better understand the exact locations of proposed Priority Development Areas, Primary Production Areas, Transit-Rich Areas, Transit-Rich and High-Resource Areas, etc.: https://opendata.mtc.ca.gov/datasets/MTC::plan-bay-area-2050-growth-geographies/explore?location=37.498436%2C-122.201465%2C13.54
b. The DEIR should provide information regarding the status of the Growth Geography areas identified, (e.g. in planning phase, partially developed, fully developed). This is crucial information for the identification and analysis of impacts to CEQA "Environmental Issue Areas." As an example, based upon the resolution provided on Attachment C Draft Blueprint Growth Geographies, version 5, it would appear some of the areas identified within the cities of Newark and Fremont may have been at least partially, if not fully developed.

4. **The Updated Priority Conservation Area Program Must Be Incorporated Into Plan Bay Area 2050+**

The "*Priority Conservation Area Refresh Final Report, Proposed Reforms for the PCA Planning Framework,*" dated May 2024 states:

> "With a refreshed PCA Framework, staff anticipate linking PCAs with Plan Bay Area 2050+ environmental strategies aimed at preserving natural and working lands, ensuring greater access to recreation and nature within cities, and adapting to climate change."

a. The DEIR should include a hyperlink for the Priority Conservation Area Mapping Viewer to provide decision-makers and the public access to an high resolution online map that displays the PCA Eligibility Areas for each of the five categories of PCAs: https://experience.arcgis.com/experience/3fa00ead34c84a43bfa935164dadbd2e/page/Page/
b. The DEIR should identify locations where each of the Growth Geographies overlay PCA Eligibility Areas.
c. The DEIR must identify the direct, indirect, and cumulative impacts of the overlay of Growth Geographies and PCA Eligibility Areas on pertinent CEQA "Environmental Issue Areas," as well as measures that could avoid or minimize those impacts.

5. **Biological Resources Section**

a. **Mapping and Tables:**
    i. Providing maps that depict the intersection of PDAs, PPAs, PTAs, etc. with sensitive habitats, species, connectivity corridors, etc., provides a more complete picture of the potential impacts that might arise through implementation of PBA 2050+, provides insight

into the cumulative impacts of PBA 2050+ on critical and sensitive habitats of the Bay Area, and will enable agencies and the public to provide more substantive comments.

ii. In addition to the mapping that was provided in the DEIR for Plan Bay Area 2050, Figures 3.5-1 to 3.5-4 that depicted the location of Critical Habitat and the locations of Regional Transportation (rail, major minor road, highway and interstate), the DEIR for Plan Bay Area 2050+ should provide similar mapping for the Growth Geographies.

iii. In addition to the information that was provided in Tables 3.5-1 through Table 3.5-12 in the DEIR for PBA 2050, the DEIR for PBA 2050+ should include information regarding the impacts of the different Growth Geographies on critical habitat.

iv. Generalized locations of tidal wetlands should be provided in the PBA 2050+ DEIR. As was discussed earlier in this letter, preservation and the long-term sustainability of tidal wetlands is crucial to maintaining the health of the Bay and for providing functions that benefit the residents of the Bay Area. Mapping of this habitat already exists in numerous documents including the Tidal Marsh Ecosystem Recovery Plan[1], the 2015 Bay Ecosystem Habitat Goals Update[2] and the Adaptation Atlas[3]. Direct and indirect impacts of proposed growth geographies, infrastructure, transportation, and shoreline protection projects on tidal wetlands should be assessed, avoided and minimized. This can only be accomplished if the general locations of tidal wetlands with respect to the various growth geographies, PDAs, PPAs, PTAs, etc. are provided.

b. **Existing Conditions:**

We are encouraged by the incorporation of language into Environment Element 1 (EN1) that recognizes that habitats of the Bay are threatened by rising sea levels. We urge that the PBA 2050+ DEIR incorporates the following information regarding the state and international significance of the San Francisco Bay Estuary into the Biological Resources Existing Conditions section:

i) PBA 2050+ must recognize that the San Francisco Bay Estuary is not just of State importance, but is of hemispheric importance and that this vitally important ecosystem is at risk from the combined effects of shoreline encroachment into former baylands and sea level rise. The San Francisco Estuary is the largest estuary on the west coast of both Americas.

ii) San Francisco Bay has been recognized as a "Wetland of International Importance" by the Ramsar Convention. It has been identified as a Hemispheric Reserve for shorebirds by the Western Hemispheric Shorebird Reserve Network. This classification is the Network's highest ranking and the Network states that, "San Francisco Bay holds higher proportions of the total wintering and migrating shorebirds on the U.S. Pacific coast than any other wetland." The Bay supports hundreds of thousands of migratory waterfowl every year and has been designated an Area of Continental Significance for Waterfowl by the North American Waterfowl Conservation Plan, and an Important Bird Area by the National Audubon Society. The Bay provides Essential Fish Habitat as identified by the National Marine Fisheries Service and supports hundreds of fish and crustacean species.

iii) Even with the vast surrounding urban development, the Bay remains one of the premier ecosystems in California. The San Francisco Bay-Delta ecosystem supports over 77% of the State's coastal wetlands and will experience 2/3's of the State's socioeconomic impacts related to sea

[1] U.S. Fish and Wildlife Service. 2013. *"Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California."* Sacramento, California. xviii + 605 pp.

[2] Goals Project. 2015. *"The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015."* Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. California State Coastal Conservancy, Oakland, CA.

[3] SFEI and SPUR. 2019. *"San Francisco Bay Shoreline Adaptation Atlas: Working with Nature to Plan for Sea Level Rise Using Operational Landscape Units."* Publication #915, San Francisco Estuary Institute, Richmond, CA.

level rise. Rising sea levels will result in the drowning of the Bay's tidal wetlands habitats if wetlands can no longer keep abreast of rising seas through accretion of sediments or cannot migrate upslope due to human constructed barriers. A recent San Francisco Estuary Institute (SFEI) publication, "*Sediment for Survival*"[4] documents the threat of drowning that Bay Area wetlands will face as sea levels continue to rise and sediment supply to the Bay continues to diminish.

iv) Tidal wetlands provide essential ecosystem benefits that contribute to the region's biodiversity, provide benefits for our communities, contribute to the region's economy, and provide important climate resilience benefits, for example:

(1) The California Water Quality Monitoring Council states, "Wetland vegetation works as a sediment trap and locks up nutrients and contaminants, thereby preventing concentration downstream that can result in algal blooms or human health hazards … wetlands act as natural water purifiers, filtering and sequestering sediment and pollutants. Two-thirds or more of all the fish and most of the shellfish we consume are dependent on coastal wetlands…" (https://www.mywaterquality.ca.gov/eco_health/wetlands/extent/types/services.html#:~:text=Wetland%20vegetation%20works%20as%20a,blooms%20or%20human%20health%20hazards.)

(2) Bay Area Water treatment plants are already being asked to upgrade their processes in order to remove more nutrients to help avoid Harmful Algal Blooms. Expanded Bay wetlands will help reduce that threat and the cost imposed on Bay Area residents to achieve that goal. Expanded wetland acreage will help grow our fishing industry as wetlands act as nurseries for many of our fisheries (fish, crabs, oysters, etc.), producing more jobs.

(3) Our Bay's shoreline habitats play a significant role in reducing the impacts of storm surges, acting as barriers that protect communities from flood inundation during high tides. This is why the historically conservative US Army Corps of Engineers is now advocating for the use of **Natural** and Nature Based Features (the equivalent of Solutions), "Natural and Nature Based Features are landscape features that are used to provide engineering functions relevant to flood risk management, while producing additional economic, environmental, and/or social benefits..." (https://ewn.erdc.dren.mil/natural-nature-based-features/).

(4) Tidal marsh vegetation sequesters carbon at a rate ten times greater than tropical forests[5], thus helping in the fight against climate change and sea level rise itself. All these actions not only protect our communities but also provide immense economic benefits, reducing the need to implement other measures to address these issues.

(5) Tourism is one of the Bay Area's key industries and a living Bay, with seals, whales and birds, is one of the attractions that sustains this industry . Current data estimates that around 30% of tourists who visit the Bay Area take at least one ferry ride.

c) Identification and Analysis of Impacts to Biological Resources

i) EN 5 of Attachment B "Draft Blueprint Strategy Refinements," version 5, refers to "High-Value Conservation Lands." The DEIR should discuss how "high-priority natural lands" will be identified. What criteria would be used to determine if sites are "high-priority" natural lands?

(1) Lands identified as "Critical Habitat" for listed species should be considered "high-priority" natural lands.

[4] Dusterhoff, S.; McKnight, K.; Grenier, L.; Kauffman, N. 2021. Sediment for Survival: A Strategy for the Resilience of Bay Wetlands in the Lower San Francisco Estuary. SFEI Contribution No. 1015. San Francisco Estuary Institute: Richmond, CA.

[5] National Oceanic and Atmospheric Administration (NOAA) webpage. *Coastal Blue Carbon.* https://oceanservice.noaa.gov/ecosystems/coastal-blue-carbon/ Accessed September 2024.

(2) Undeveloped or lightly developed sites along the edges of the Bay that could support tidal marsh (and other baylands habitats) upslope migration should be considered "high-priority natural lands."

ii) The DEIR must identify and analyze the direct, indirect and cumulative impacts of the Growth Geographies on the natural habitats of the Bay (habitat degradation/loss, fragmentation, light impacts to biological resources, noise/vibration impacts to biological resources, introduction of non-native nuisance species, etc.).

iii) The DEIR should provide worst case scenario of acreages of habitats that may be impacted by the location of Growth Geographies along the shoreline.

iv) The DEIR should identify and analyze the direct, indirect, and cumulative impacts of shoreline Growth Geographies on the ability of baylands habitats to migrate landward as sea levels continue to rise. As an example, the adverse impacts of development, transportation, recreation and sea level rise adaptation projects can have on the ability of tidal wetlands to migrate inland as sea level rises, exacerbating and resulting in the drowning of wetlands. Seawalls and traditional levees can result in erosion of adjacent habitats.

v) The DEIR should follow the sequence of analyzing strategies that will avoid direct, indirect and cumulative impacts of Growth Geographies on biological resources. If impacts cannot be avoided, the next strategy should be to minimize adverse impacts to biological resources.

vi) If compensatory mitigation is proposed for potential impacts to biological resources that cannot be avoided or minimized, proposed mitigation ratios should be high enough to:

(1) Offset the temporal losses of wetland or riparian functions and values and to ensure "no net loss of wetlands" as required by the State's Wetlands Conservation Policy (Executive Order W-59-93).

(2) Consider the limited locations in the Central and South Bay where tidal marsh (and other baylands habitats) can be created/restored, or enhanced

(3) Take into consideration the fact that analyses of compensatory mitigation for habitat loss have often concluded that compensatory mitigation often fails to replace lost functions or values.

(4) Should consider the crucial role that existing natural baylands habitats have in mitigating the impacts of climate change.

(5) A one-to-one mitigation ratio is setting the bar too low. The National Research Council in 1992 recommended ratios of at least three, five, or ten acres of mitigation wetlands or streams for every acre of wetland or stream destroyed depending on its functional value.

We deeply appreciate that EN-1 mentions the dedication of sufficient funds to support 100,000 acres of marsh restoration regionwide. However, without an assessment of whether shoreline-located Growth Geographies could adversely impact current baylands habitats, as well as areas that could support these habitats as sea levels continue to rise, this long-range strategy is likely to fall short.

6. <u>Climate Change</u>

a. The DEIR should provide mapping of the Growth Geographies that has overlaying mapping of the 4.9' total water levels from projected sea level rise for the identification of Growth Geographies of new development/infrastructure or redevelopment/relocation of existing development/infrastructure that would be at risk. The DEIR should also provide an analysis of impacts to the built and natural environment resulting from the location of Growth Geographies in areas that are projected to be vulnerable to flood risk due to rising sea levels, major storm events, or groundwater rise.

b. The DEIR must identify Growth Geographies that overlay PCA Eligibility Areas for Natural Lands and Climate Adaptation.

c. The DEIR must analyze the direct, indirect and cumulative impacts of Growth Geographies on the climate resilience of shoreline communities.

d. We firmly support the proposed language of the "Strategy Long Descriptions" for EN1 that prioritizes the use of nature-based actions, but suggest for consistency with the terminology used in BCDC's RSAP Guidelines, that the term be changed to "natural and nature-based solutions."
e. The PBA 2050+ DEIR should include and recognize climate adaptation strategies that avoid placing new development/infrastructure or redevelopment or relocation of existing infrastructure in areas that have been identified as vulnerable to existing or future flood inundation (total water level of 4.9').

7. **Alternatives for Consideration**

a. An alternative that avoids placing new development/infrastructure or redevelopment or relocated infrastructure in areas that will be inundated by 4.9' total water levels should be included in the DEIR. The reasons for such an alternative are
    i. Economics - the report[6] authored by MTC-ABAG and BCDC of the anticipated $105 billion dollar shortfall for protecting development and infrastructure that currently exists by 2050.
    ii. The fact that placing new development/infrastructure or redevelopment/relocated infrastructure in areas that could provide migration space for baylands habitats, or areas where natural and nature-based solutions could be implemented, adversely impacts the long-term sustainability of the natural and built environment.
    iii. Wang et al[7] have noted "...measures to prevent flooding along an embayment shoreline in one location or subregion may increase inundation elsewhere in the system." We are one Bay. Water displaced by raised fill pads, seawalls or levees at one location must flow elsewhere. Wang et al go on to state:

> "The network of interactions occurs not only within subbasins of the Bay but also across the greater geographic extent from one end of the Bay to the other, and local jurisdiction may have either reciprocal relationships with or asymmetric impacts on one other. Importantly, the nature of the interaction network is seen to evolve with SLR: interactions are purely subregional at current sea level but with higher sea level (e.g., 1 m of SLR), not only do the subregional interdependencies strengthen but also regional interdependences emerge."

With this in mind, the fact that a governance gap exists due to our lack of regional control over how adaptation to sea level rise differs from one shoreline community to the next increases the likelihood of indirect impacts in which distant shorelines face flooding and inundation due to hard-edged shoreline protections elsewhere in the bay. This could have consequences throughout the region as sea level inundation rates increase. Water deflected from Engineered fill pads, levees or seawalls designed to protect new development from the 100-year flood or sea level rise, has consequences for adjacent communities. As mentioned previously, these types of projects can also have significant and adverse impacts to tidal wetlands resulting in the drowning of wetlands or degradation through erosion, etc. It is the intent of BCDC's RSAP Guidelines to avoid some of these unintended consequences of one local government adversely impacts neighboring and distant communities by insisting on a regional perspective when developing SSAPs.

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[6] Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG) and Bay Conservation and Development Commission (BCDC). "*Sea Level Rise Adaptation Funding and Investment Framework Final Report."* July 2023.

[7] Wang, R.-Q., Stacey, M. T., Herdman, L. M. M., Barnard, P. L., & Erikson, L. (2018). "*The influence of sea level rise on the regional interdependence of coastal infrastructure.*" *Earth's Future*, 6, 677– 688. https://doi.org/10.1002/2017EF000742

The San Francisco Bay Regional Coastal Hazards Adaptation Resiliency Group (CHARG), is "an organization of flood managers and scientists responsible for reducing flood risk in the San Francisco Bay area." CHARG has created a series of maps for the Bay Area counties that depict "Sea Level Rise Connectivity Between Bay Area Jurisdictions" that can be viewed on their website: https://sfbaycharg.org/our-work/jurisdiction-connectivity/ We believe this is an admirable effort, but it only addresses impacts related to identified flood control projects, not those associated with development, transportation or recreational trails. The strategies utilized to address sea level rise inundation for these other types of projects can also contribute to localized or regional exacerbation of sea level rise impacts. Thus, a moratorium restricting construction of new development in areas that are vulnerable to total water levels of 4.9', could in fact, result in reductions of significant and adverse impacts to biological resources and residents of the Bay Area.

It is clear, therefore, that one of the DEIR alternatives must have the RSAP/SSAP incorporated into the PBA 2050+ in order to provide the regional approach to SLR impacts necessitated by the anticipated 4.9 feet of sea level rise by 2050 and the recognized impacts it will bring to shoreline communities, Bay habitats and wildlife, and to the economic and environmental benefits the Bay provides. The DEIR must analyze the negative impacts that would occur in failing to adopt such an alternative.

Conclusion:

The Environment Element of Plan Bay Area 2050 leaned heavily into the issue of environmental hazards and threats to human health and well-being. While these are certainly important concerns, we are encouraged that the information regarding updates to EN1, EN 4 and EN5, begins to describe the important role the habitats of the Bay play in supporting biodiversity, providing climate resilience for the natural and built environments, and human health and well-being. The impacts of the Growth Geographies on the natural environment need to be identified, analyzed, avoided, minimized and appropriate mitigation proposed in the DEIR. And it is imperative that BCDC RSAP Guidelines be incorporated into PBA 2050+ in a manner that will avoid conflicts and inconsistencies between the two plans. Lastly, it is important that the updated PCA program be incorporated into PBA 2050+. We appreciate the opportunity to provide Scoping comments and request that we be alerted to future opportunities for review and comment on PBA 2050+ documents.

Respectfully submitted,

Carin High
CCCR, Co-Chair

Gail Raabe
CCCR, Co-Chair

Yingying Cai

From: Adam Noelting <ANoelting@bayareametro.gov>
Sent: Thursday, February 13, 2025 9:31 AM
To: Kari Zajac
Cc: Yingying Cai
Subject: Fw: Plan BayArea EI

FYI.

From: George March
Sent: Friday, January 24, 2025 11:14 AM
To: EIR Comments <eircomments@bayareametro.gov>
Subject: Plan BayArea EI

[You don't often get email from gnmarch@sbcglobal.net. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

External Email

Hi,
I sure hope the Environmental Impact (EI) portion of any future project(s) looks severely at the typical scenario of construction and growth in California (in general) over the past 50+ years:
Knock down and grind up all the old stuff, squash in minimal space housing, pave over everything and claim (minimal) environmental correctness by planting trees everywhere.

What has this accomplished? Lost history, dense structure placement, excessive water runoff challenges when it rains and great canopies of trees that are ripe for fire, as seen in the recent firestorms of the last decades - Los Angeles right now as well as Santa Rosa, Redding, and Oakland - and more. (Yes, other conditions contributed in those events...)

Look at the Bay Area historically and you will find it was dominated by marshes and grasslands predominately. Not anymore! Thick canopies and undergrowth are everywhere.
Maybe mother nature is more correct in managing evolving local and regional climates than environmental planners?
Take some hints in your planning.
Maybe this is the time to rethink where you want to “recommend” putting homes that may be in the natural paths for fire or flood and how densely they can be placed.
Quit paving every piece of dirt. Not only is it burdensome for runoff, but that runoff is now no longer recharging aquifers. And significant areas that are paved now are urban heat islands that have their own impacts on local climates.
And then, of course, there is the California challenge of earth movement- earthquake and debris flow. Certainly to consider with either of these is the added chance of fire to accompany them in any severe-level event.

So much to take into account beyond the man-made challenges of politics, land ownership, and the legal constraints.
(and I’m not even touching on the challenges of public transportation-that’s a whole other story)

George March
Martinez CA

Please pardon incorrectly substituted words that have been subject to "auto-corrupt".
🎶🎺😻🖐🎾🪙

Appendix C

Biological Resources Data

Table C-1 Special-Status Species Evaluated for Plan Bay Area 2050+

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Plants						
Pink sand-verbena	*Abronia umbellata* var. *breviflora*	—	—	1B.1	—	Foredunes and interdunes with sparse cover.
San Mateo thorn-mint	*Acanthomintha duttonii*	E	E	1B.1	—	Chaparral, valley and foothill grassland.
Blasdale's bent grass	*Agrostis blasdalei*	—	—	1B.2	—	Coastal dunes, coastal bluff scrub, coastal prairie.
Franciscan onion	*Allium peninsulare* var. *franciscanum*	—	—	1B.2	—	Cismontane woodland, valley and foothill grassland.
Sharsmith's onion	*Allium sharsmithiae*	—	—	1B.3	—	Cismontane woodland, chaparral. Rocky, serpentine slopes.
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	E	—	1B.1	—	Wet areas, marshes, and riparian banks, with other wetland species.
Napa false indigo	*Amorpha californica* var. *napensis*	—	—	1B.2	—	Broadleafed upland forest, chaparral, cismontane woodland.
Large-flowered fiddleneck	*Amsinckia grandiflora*	E	E	1B.1	—	Cismontane woodland, valley and foothill grassland.
Bent-flowered fiddleneck	*Amsinckia lunaris*	—	—	1B.2	—	Cismontane woodland, valley and foothill grassland, coastal bluff scrub.
Anderson's manzanita	*Arctostaphylos andersonii*	—	—	1B.2	—	Open sites, redwood forest.
Mt. Diablo manzanita	*Arctostaphylos auriculata*	—	—	1B.3	—	Chaparral, cismontane woodland.
Baker's manzanita	*Arctostaphylos bakeri* ssp. *Bakeri*	—	R	1B.1	—	Broadleafed upland forest, chaparral. Often on serpentine.
The Cedars manzanita	*Arctostaphylos bakeri* ssp. *Sublaevis*	—	R	1B.2	—	In serpentine chaparral and Sargent cypress woodland; typically in canyons and on slopes.
Vine Hill manzanita	*Arctostaphylos densiflora*	—	E	1B.1	—	Chaparral. Acid marine sand.
Franciscan manzanita	*Arctostaphylos franciscana*	E	E	1B.1	—	Chaparral.
San Bruno Mountain manzanita	*Arctostaphylos imbricata*	—	E	1B.1	—	Chaparral, coastal scrub.
Konocti manzanita	*Arctostaphylos manzanita* ssp. *elegans*	—	—	1B.3	—	Chaparral, cismontane woodland, lower montane coniferous forest. Volcanic soils.
Contra Costa manzanita	*Arctostaphylos manzanita* ssp. *laevigata*	—	—	1B.2	—	Chaparral. Rocky slopes.
Mt. Tamalpais manzanita	*Arctostaphylos montana* ssp. *montana*	—	—	1B.3	—	Chaparral, valley and foothill grassland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	E	E	1B.1	—	Chaparral, coastal prairie, coastal scrub.
Montara manzanita	*Arctostaphylos montaraensis*	—	—	1B.2	—	Chaparral, coastal scrub.
Pacific manzanita	*Arctostaphylos pacifica*	—	E	1B.2	—	Coastal scrub, chaparral.
Pallid manzanita	*Arctostaphylos pallida*	T	E	1B.1	—	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub.
Kings Mountain manzanita	*Arctostaphylos regismontana*	—	—	1B.2	—	Broadleaved upland forest, chaparral, north coast coniferous forest.
Rincon Ridge manzanita	*Arctostaphylos stanfordiana* ssp. *decumbens*	—	—	1B.1	—	Chaparral, cismontane woodland.
Marin manzanita	*Arctostaphylos virgata*	—	—	1B.2	—	Broadleafed upland forest, closed-cone coniferous forest, chaparral, north coast coniferous forest. On sandstone or granitic soils.
Marsh sandwort	*Arenaria paludicola*	E	E	1B.1	—	Freshwater marsh, marsh and swamp, wetland.
Humboldt County milk-vetch	*Astragalus agnicidus*	—	SE	1B.1	—	Broadleafed upland forest, north coast coniferous forest. Disturbed openings in partially timbered forest lands; also along ridgelines; south aspects.
Clara Hunt's milk-vetch	*Astragalus claranus*	E	T	1B.1	—	Cismontane woodland, valley and foothill grassland, chaparral.
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	—	—	1B.2	—	Coastal dunes, marshes and swamps, coastal scrub.
Jepson's milk-vetch	*Astragalus rattanii* var. *jepsonianus*	—	—	1B.2	—	Commonly on serpentine in grassland or openings in chaparral.
Ferris' milk-vetch	*Astragalus tener* var. *ferrisiae*	—	—	1B.1	—	Subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil.
Alkali milk-vetch	*Astragalus tener* var. *tener*	—	—	1B.2	—	Alkali playa, valley and foothill grassland, vernal pools.
Heartscale	*Atriplex cordulata* var. *cordulata*	—	—	1B.2	—	Chenopod scrub, valley and foothill grassland, meadows, and seeps.
Brittlescale	*Atriplex depressa*	—	—	1B.2	—	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools.
Lesser saltscale	*Atriplex minuscula*	—	—	1B.1	—	Chenopod scrub, playas, valley and foothill grassland.
Vernal pool smallscale	*Atriplex persistens*	—	—	1B.1	—	Vernal pools, wetland.
Big-scale balsamroot	*Balsamorhiza macrolepis*	—	—	1B.2	—	Chaparral, valley and foothill grassland, cismontane woodland.
Sonoma sunshine	*Blennosperma bakeri*	E	E	1B.1	—	Vernal pools, valley and foothill grassland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Point Reyes blennosperma	*Blennosperma nanum* var. *robustum*	—	R	1B.2	—	On open coastal hills in sandy soil.
Big tarplant	*Blepharizonia plumosa*	—	—	1B.1	—	Valley and foothill grassland.
Mt. Day rockcress	*Boechera rubicundula*	—	—	1B.1	—	Chaparral. Rocky slopes.
Watershield	*Brasenia schreberi*	—	—	2B.3	—	Aquatic, from water bodies both natural and artificial in California.
Narrow-anthered brodiaea	*Brodiaea leptandra*	—	—	1B.2	—	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland.
Thurber's reed grass	*Calamagrostiis crassiglumis*	—	—	2B.1	—	Coastal scrub, marshes, and swamps.
Mt. Diablo fairy-lantern	*Calochortus pulchellus*	—	—	1B.2	—	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland.
The Cedars fairy-lantern	*Calochortus raichei*	—	—	1B.2	—	On serpentine. Usually on shaded slopes, but also on barrens and talus.
Tiburon mariposa-lily	*Calochortus tiburonensis*	T	T	1B.1	—	On open, rocky, slopes in serpentine grassland.
Small-flowered calycadenia	*Calycadenia micrantha*	—	—	1B.2	—	Rocky talus or scree; sparsely vegetated areas. Occasionally on roadsides and sometimes on serpentine.
Santa Cruz Mountains pussypaws	*Calyptridium parryi* var. *hesseae*	—	—	1B.1	—	Chaparral, cismontane woodland. Sandy or gravelly openings.
Coastal bluff morning-glory	*Calystegia purpurata* ssp. *saxicola*	—	—	1B.2	—	Coastal dunes, coastal scrub, coastal bluff scrub, north coast coniferous forest.
Seaside bittercress	*Cardamine angulate*	—	—	2B.1		North coast coniferous forest, lower montane coniferous forest. Wet areas, streambanks.
California sedge	*Carex californica*	—	—	2B.2		Meadows, drier areas of swamps, marsh margins.
Bristly sedge	*Carex comosa*	—	—	2B.1	—	Marshes and swamps, coastal prairie, valley and foothill grassland.
Bristle-stalked sedge	*Carex leptalea*	—	—	2B.2	—	Mostly known from bogs and wet meadows
Lyngbye's sedge	*Carex lyngbyei*	—	—	2B.2	—	Marshes and swamps (brackish or freshwater).
Northern meadow sedge	*Carex praticola*	—	—	2B.2	—	Moist to wet meadows.
Deceiving sedge	*Carex saliniformis*	—	—	1B.2	—	Coastal prairie, coastal scrub, meadows and seeps, marshes, and swamps (coastal salt).
Tiburon paintbrush	*Castilleja affinis* var. *neglecta*	E	T	1B.2	—	Valley and foothill grassland. Rocky serpentine sites.
Humboldt Bay owl's-clover	*Castilleja ambigua* var. *humboldtiensis*	—	—	1B.2	—	Marshes and swamps.
Mead's owls-clover	*Castilleja ambigua* var. *meadii*	—	—	1B.1	—	Vernal pools, meadows, and seeps. Soils of volcanic origin and tend to have high clay content and be gravelly.
Point Reyes paintbrush	*Castilleja leschkeana*	—	—	1A	—	Coastal marshes and swamps.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Mendocino Coast paintbrush	*Castilleja mendocinensis*	—	—	1B.2	—	Often on sea bluffs or cliffs in coastal bluff scrub or prairie.
Pink creamsacs	*Castilleja rubicundula* var. *rubicundula*	—	—	1B.2	—	Openings in chaparral or grasslands, on serpentine.
Pitkin Marsh paintbrush	*Castilleja uliginosa*	—	E	1A	—	Last known remaining plant died in 1987; was known from overgrown freshwater marsh.
Lemmon's jewelflower	*Caulanthus lemmonii*	—	—	1B.2	—	Pinyon and juniper woodland, valley and foothill grassland.
Rincon Ridge ceanothus	*Ceanothus confusus*	—	—	1B.1	—	Closed-cone coniferous forest, chaparral, cismontane woodland.
Nicasio ceanothus	*Ceanothus decornutus*	—	—	1B.2	—	Maritime chaparral; serpentinite, rocky, sometimes clay.
Calistoga ceanothus	*Ceanothus divergens*	—	—	1B.2	—	Chaparral.
Coyote ceanothus	*Ceanothus ferrisiae*	E	E	1B.1	—	Chaparral, valley and foothill grassland, coastal scrub.
Vine Hill ceanothus	*Ceanothus foliosus* var. *vineatus*	—	—	1B.1	—	Chaparral.
Mt. Vision ceanothus	*Ceanothus gloriosus* var. *porrectus*	—	—	1B.3	—	Low shrub in a variety of habitats on Point Reyes; sandy soils.
Mason's ceanothus	*Ceanothus masonii*	—	—	1B.2	—	Serpentine ridges or slopes in chaparral or transition zone.
Holly-leaved ceanothus	*Ceanothus purpureus*	—	—	1B.2	—	Chaparral, cismontane woodland.
Sonoma ceanothus	*Ceanothus sonomensis*	—	—	1B.2	—	Chaparral.
Congdon's tarplant	*Centromadia parryi* ssp. *congdonii*	—	—	1B.1	—	Valley and foothill grassland.
Pappose tarplant	*Centromadia parryi* ssp. *parryi*	—	—	1B.2	—	Chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland.
Dwarf soaproot	*Chlorogalum pomeridianum* var. *minus*	—	—	1B.2	—	Chaparral on serpentine.
Point Reyes salty bird's-beak	*Chloropyron maritimum* ssp. *palustre*	—	—	1B.2	—	Coastal salt marsh.
Hispid salty bird's-beak	*Chloropyron molle* ssp. *hispidum*	—	—	1B.2	—	Alkali playa, Meadow and seep, wetland.
Soft salty bird's-beak	*Chloropyron molle* ssp. *molle*	E	R	1B.2	—	Coastal salt marsh.
Palmate-bracted salty bird's-beak	*Chloropyron palmatum*	E	E	1B.1	—	Chenopod scrub, valley and foothill grassland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	—	—	1B.2	—	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub.
Woolly-headed spineflower	*Chorizanthe cuspidata* var. *villosa*	—	—	1B.2	—	Sandy places near the beach.
Robust spineflower	*Chorizanthe robusta* var. *robusta*	E	E	1B.1	—	Cismontane woodland, coastal dunes, coastal scrub, chaparral.
Sonoma spineflower	*Chorizanthe valida*	E	E	1B.1	—	Coastal prairie.
Bolander's water-hemlock	*Cicuta maculata* var. *bolanderi*	—	—	2B.1	—	Marshes and swamps, fresh or brackish water.
Franciscan thistle	*Cirsium andrewsii*	—	—	1B.2	—	Coastal bluff scrub, broadleaved upland forest, coastal scrub, coastal prairie.
Mt. Hamilton fountain thistle	*Cirsium fontinale* var. *campylon*	—	—	1B.2	—	Cismontane woodland, chaparral, valley and foothill grassland.
Crystal Springs fountain thistle	*Cirsium fontinale* var. *fontinale*	E	E	1B.1	—	Valley and foothill grassland, chaparral, cismontane woodland, meadows, and seeps.
Suisun thistle	*Cirsium hydrophilum* var. *hydrophilum*	E	E	1B.1	—	Marshes and swamps.
Mt. Tamalpais thistle	*Cirsium hydrophilum* var. *vaseyi*	—	—	1B.2	—	Broadleafed upland forest, chaparral, meadows, and seeps.
Compact cobwebby thistle	*Cirsium occidentale* var. *compactum*	—	—	1B.2	—	Chaparral, coastal dunes, coastal prairie, coastal scrub.
Lost thistle	*Cirsium praeteriens*	—	—	1A	—	Little information exists on this plant; it was collected from the Palo Alto area at the turn of the 20th Century.
Raiche's red ribbons	*Clarkia concinna* ssp. *raichei*	—	—	1B.1	—	Coastal bluff scrub.
Presidio clarkia	*Clarkia franciscana*	E	E	1B.1	—	Coastal scrub, valley and foothill grassland.
Vine Hill clarkia	*Clarkia imbricata*	E	R	1B.1	—	Chaparral, valley and foothill grassland. Acidic, sandy soil.
Round-headed Chinese-houses	*Collinsia corymbosa*	—	—	1B.2	—	Coastal dunes.
San Francisco collinsia	*Collinsia multicolor*	—	—	1B.2	—	Closed-cone coniferous forest, coastal scrub.
Mt. Diablo bird's-beak	*Cordylanthus nidularius*	—	R	1B.1	—	Grassy or rocky areas within serpentine chaparral.
Pennell's bird's-beak	*Cordylanthus tenuis* ssp. *capillaris*	E	R	1B.2	—	In open or disturbed areas on serpentine within forest or chaparral.
Serpentine cryptantha	*Cryptantha dissita*	—	—	1B.2	—	Serpentine outcrops in chaparral.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Hoover's cryptantha	*Cryptantha hooveri*	—	—	1A	—	Valley and foothill grassland, inland dunes.
Peruvian dodder	*Cuscuta obtusiflora* var. *glandulosa*	—	—	2B.2	—	Marsh and swamp, wetland.
Mendocino dodder	*Cuscuta pacifica* var. *papillata*	—	—	1B.2	—	Interdune depressions. Annual parasitic vine.
Livermore tarplant	*Deinandra bacigalupii*	—	CE	1B.1	—	Meadows and seeps.
Baker's larkspur	*Delphinium bakeri*	E	E	1B.1	—	Broadleafed upland forest, coastal scrub, valley and foothill grassland.
Hospital Canyon larkspur	*Delphinium californicum* ssp. *interius*	—	—	1B.2	—	Chaparral, cismontane woodland, coastal scrub, meadow and seep.
Golden larkspur	*Delphinium luteum*	E	R	1B.1	—	Chaparral, coastal prairie, coastal scrub.
Recurved larkspur	*Delphinium recurvatum*	—	—	1B.2	—	Chenopod scrub, cismontane woodland, valley and foothill grassland.
Silverskin lichen	*Dermatocarpon meiophyllizum*	—	—	2B.3	—	Coastal prairie, lower montane coniferous forest, north coast coniferous forest, subalpine coniferous forest, upper montane coniferous forest Usually aquatic to semi-aquatic, within splash zone of lakes or streams. Preferred habitat is undisturbed, exposed streams with large rocks or bedrock at high elevations, but it is also found in cold, deep canyons at lower elevations.
Western leatherwood	*Dirca occidentalis*	—	—	1B.2	—	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland.
Dwarf downingia	*Downingia pusilla*	—	—	2B.2	—	Valley and foothill grassland (mesic sites), vernal pools.
Santa Clara Valley dudleya	*Dudleya abramsii* ssp. *setchellii*	E	E	1B.1	—	Valley and foothill grassland, cismontane woodland.
Swamp harebell	*Eastwoodiella californica*	—	—	1B.2		Bogs and marshes in a variety of habitats; uncommon where it occurs.
Koch's cord moss	*Enthosthodon kochii*	—	—	1B.3	—	Moss growing on soil on riverbanks.
Lime Ridge eriastrum	*Eriastrum ertterae*	—	—	1B.1	—	Openings or edges; alkaline or semi-alkaline, sandy.
Greene's narrow-leaved daisy	*Erigeron greenei*	—	—	1B.2	—	Chaparral.
Serpentine daisy	*Erigeron serpentinus*	—	—	1B.3	—	Chaparral. Serpentine seeps.
Supple daisy	*Erigeron supplex*	—	—	1B.2	—	Usually in grassy sites.
The Cedars buckwheat	*Eriogonum cedrorum*	—	—	1B.3	—	Serpentine. Barren rock and talus steep slopes.
Tiburon buckwheat	*Eriogonum luteolum* var. *caninum*	—	—	1B.2	—	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie.
Snow Mountain buckwheat	*Eriogonum nervulosum*	—	—	1B.2	—	Dry serpentine outcrops, balds, and barrens.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Ben Lomond buckwheat	*Eriogonum nudum* var. *decurrens*	—	—	1B.1	—	Ponderosa pine sandhills in Santa Cruz County.
Antioch Dunes buckwheat	*Eriogonum nudum* var. *psychicola*	—	—	1B.1	—	Interior dunes.
Mt. Diablo buckwheat	*Eriogonum truncatum*	—	—	1B.1	—	Chaparral, coastal scrub, valley and foothill grassland.
San Mateo woolly sunflower	*Eriophyllum latilobum*	E	E	1B.1	—	Cismontane woodland, coastal scrub, lower montane coniferous forest.
Hoover's button-celery	*Eryngium aristulatum* var. *hooveri*	—	—	1B.1	—	Vernal pools.
Loch Lomond button-celery	*Eryngium constancei*	E	E	1B.1	—	Volcanic ash flow vernal pools.
Jepson's coyote-thistle	*Eryngium jepsonii*	—	—	1B.2	—	Vernal pools, valley and foothill grassland.
Tuolumne button-celery	*Eryngium pinnatisectum*	—	—	1B.2	—	Volcanic soils; vernal pools and mesic sites within other natural communities.
Delta button-celery	*Eryngium racemosum*	—	E	1B.1	—	Seasonally inundated floodplain on clay.
Spiny-sepaled button-celery	*Eryngium spinosepalum*	—	—	1B.2	—	Some sites on clay soil of granitic origin; vernal pools, within grassland.
Sand-loving wallflower	*Erysimum ammophilum*	—	—	1B.2	—	Sandy openings.
Contra Costa wallflower	*Erysimum capitatum* var. *angustatum*	E	E	1B.1	—	Inland dunes.
Bluff wallflower	*Erysimum concinnum*	—	—	1B.2	—	Coastal bluff scrub, coastal dunes, coastal prairie.
Coast fawn lily	*Erythronium revolutum*	—	—	2B.2	—	Bogs and fens, broadleafed upland forest, north coast coniferous forest. Mesic sites, streambanks.
Diamond-petaled California poppy	*Eschscholzia rhombipetala*	—	—	1B.1	—	Valley and foothill grassland.
San Joaquin spearscale	*Extriplex joaquinana*	—	—	1B.2		Chenopod scrub, alkali meadow, playas, valley and foothill grassland.
Minute pocket moss	*Fissidens pauperculus*	—	—	1B.2	—	North coast coniferous forest.
Hillsborough chocolate lily	*Fritillaria biflora* var. *ineziana*	—	—	1B.1	—	Cismontane woodland, valley and foothill grassland.
Talus fritillary	*Fritillaria falcata*	—	—	1B.2	—	On shale, granite, or serpentine talus.
Marin checker lily	*Fritillaria lanceolata* var. *tristulis*	—	—	1B.1	—	Coastal bluff scrub, coastal scrub, coastal prairie.
Fragrant fritillary	*Fritillaria liliacea*	—	—	1B.2	—	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland.
Adobe-lily	*Fritillaria pluriflora*	—	—	1B.2	—	Chaparral, cismontane woodland, foothill grassland.
Roderick's fritillary	*Fritillaria roderickii*	—	E	1B.1	—	Grassy slopes, mesas.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	—	—	1B.1	—	Coastal dunes, coastal scrub.
Pacific gilia	*Gilia capitata* ssp. *pacifica*	—	—	1B.2	—	Coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland.
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	—	—	1B.1	—	Coastal bluff scrub, valley and foothill grassland.
Dark-eyed gilia	*Gilia millefoliata*	—	—	1B.2	—	Coastal dunes.
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	—	—	1B.2	—	Clay soils. Usually in vernal pools, sometimes on lake margins.
Toren's grimmia	*Grimmia torenii*	—	—	1B.3	—	Openings, rocky, boulder and rock walls, carbonate, volcanic.
Hall's harmonia	*Harmonia hallii*	—	—	1B.2	—	Open, rocky areas within chaparral.
Diablo helianthella	*Helianthella castanea*	—	—	1B.2	—	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.
Congested-headed hayfield tarplant	*Hemizonia congesta* ssp. *congesta*	—	—	1B.2	—	Valley and foothill grassland.
Short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	—	—	1B.2	—	Coastal bluff scrub, coastal dunes, coastal prairie.
Butano Ridge cypress	*Hesperocyparis abramsiana* var. *butanoensis*	T	E	1B.2	—	Closed-cone coniferous forest, lower montane coniferous forest, chaparral. Sandstone.
Pygmy cypress	*Hesperocyparis pygmaea*	—	—	1B2	—	On podzol-like blacklock soil in pygmy cypress forest community.
Two-carpellate western flax	*Hesperolinon bicarpellatum*	—	—	1B.2	—	Serpentine barrens at edge of chaparral.
Brewer's western flax	*Hesperolinon breweri*	—	—	1B.2	—	Chaparral, cismontane woodland, valley and foothill grassland.
Marin western flax	*Hesperolinon congestum*	T	T	1B.1	—	Chaparral, valley and foothill grassland.
Drymaria-like western flax	*Hesperolinon drymarioides*	—	—	1B.2	—	Serpentine soils, mostly within chaparral.
Sharsmith's western flax	*Hesperolinon sharmithiae*	—	—	1B.2	—	Chaparral. Serpentine substrates.
Tehama County western flax	*Hesperolinon tehamense*	—	—	1B.3	—	Serpentine barrens in chaparral.
Water star-grass	*Heteranthera dubia*	—	—	2B.2	—	Marshes and swamps.
Woolly rose-mallow	*Hibiscus lasiocarpos* var. *occidentalis*	—	—	1B.2	—	Marshes and swamps (freshwater).
Loma Prieta hoita	*Hoita strobilina*	—	—	1B.1	—	Chaparral, cismontane woodland, riparian woodland.
Santa Cruz tarplant	*Holocarpha macradenia*	T	E	1B.1	—	Coastal prairie, coastal scrub, valley and foothill grassland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	—	—	1B.1	—	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral.
Point Reyes horkelia	*Horkelia marinensis*	—	—	1B.2	—	Coastal dunes, coastal prairie, coastal scrub.
Thin-lobed horkelia	*Horkelia tenuiloba*	—	—	1B.2	—	Broadleaved upland forest, chaparral, valley and foothill grassland.
Island rock lichen	*Hypogymnia schizidiata*	—	—	1B.3	—	On bark and wood of hardwoods and conifers.
Carquinez goldenbush	*Isocoma arguta*	—	—	1B.1	—	Valley and foothill grassland.
Santa Lucia dwarf rush	*Juncus luciensis*	—	—	1B.2	—	Vernal pools, ephemeral drainages, wet meadow habitats, and streamsides.
Small groundcone	*Kopsiopsis hookeri*	—	—	2B.3	—	North coast coniferous forest.
Burke's goldfields	*Lasthenia burkei*	E	E	1B.1	—	Vernal pools, meadows, and seeps.
Baker's goldfields	*Lasthenia californica* ssp. *bakeri*	—	—	1B.2	—	Closed-cone coniferous forest, coastal scrub, meadows and seeps, marshes, and swamps.
Perennial goldfields	*Lasthenia californica* ssp. *macrantha*	—	—	1B.2	—	Coastal bluff scrub, coastal dunes, coastal scrub.
Alkali-sink goldfields	*Lasthenia chrysantha*	—	—	1B.1	—	Vernal pools. Alkaline soils.
Contra Costa goldfields	*Lasthenia conjugens*	E	E	1B.1	—	Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland.
Coulter’s goldfields	*Lasthenia glabrata* ssp. *coulteri*	—	—	1B.1	—	Usually found on alkaline soils in playas, sinks, and grasslands.
Delta tule pea	*Lathyrus jepsonii* var. *jepsonii*	—	—	1B.2		Freshwater and brackish marshes.
Marsh pea	*Lathyrus palustris*	—	—	2B.2	—	Moist coastal areas.
Beach layia	*Layia carnosa*	E	E	1B.1	—	Coastal dunes, coastal scrub.
Colusa layia	*Layia septentrionalis*	—	—	1B.2	—	Chaparral, cismontane woodland, ultramafic, valley and foothill grassland.
Legenere	*Legenere limosa*	—	—	1B.1	—	Vernal pools.
Heckard’s pepper-grass	*Lepidium latipes* var. *heckardii*	—	—	1B.2	—	Grassland, and sometimes vernal pool edges. Alkaline soils.
Coast yellow leptosiphon	*Leptosiphon croceus*	—	CE	1B.1	—	Coastal bluff scrub, coastal prairie.
Jepson's leptosiphon	*Leptosiphon jepsonii*	—	—	1B.2	—	Chaparral, cismontane woodland.
Rose leptosiphon	*Leptosiphon rosaceus*	—	—	1B.1	—	Coastal bluff scrub.
Mt. Hamilton coreopsis	*Leptosyne hamiltonii*	—	—	1B.2	—	On steep shale talus with open southwestern exposure.
Crystal Springs lessingia	*Lessingia arachnoidea*	—	—	1B.2	—	Coastal sage scrub, valley and foothill grassland, cismontane woodland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
San Francisco lessingia	*Lessingia germanorum*	E	E	1B.1	—	Coastal scrub.
Smooth lessingia	*Lessingia micradenia* var. *glabrata*	—	—	1B.2	—	Chaparral, cismontane woodland.
Tamalpais lessingia	*Lessingia micradenia* var. *micradenia*	—	—	1B.2	—	Chaparral, valley and foothill grassland.
Mason's lilaeopsis	*Lilaeopsis masonii*	—	R	1B.1	—	Freshwater and brackish marshes, riparian scrub.
Coast lily	*Lilium maritimum*	—	—	1B.1	—	Historically in sandy soil, often on raised hummocks or bogs; today mostly in roadside ditches
Pitkin Marsh lily	*Lilium pardalinum* ssp. *pitkinense*	E	E	1B.1	—	Cismontane woodland, meadows and seeps, marshes and swamps.
Ornduff's meadowfoam	*Limnanthes douglasii* ssp. *ornduffii*	—	—	1B.1	—	Meadows and seeps, agricultural fields.
Point Reyes meadowfoam	*Limnanthes douglasii* ssp. *sulphurea*	—	E	1B.2	—	Vernally wet depressions in open rolling, coastal prairies and meadows; typically in dark clay soil.
Sebastopol meadowfoam	*Limnanthes vinculans*	E	E	1B.1	—	Meadows and seeps, vernal pools, valley and foothill grassland.
Delta mudwort	*Limosella australis*	—	—	2B.1	—	Riparian scrub, marshes and swamps.
Mt Hamilton lomatium	*Lomatium observatorium*	—	—	1B.2	—	Open to partially shaded openings in *Pinus coulteri*-oak woodland. Sedimentary Franciscan rocks and volcanic soils.
Cobb Mountain lupine	*Lupinus sericatus*	—	—	1B.2	—	In stands of knobcone pine-oak woodland, on open wooded slopes in gravelly soils; sometimes on serpentine.
Tidestrom's lupine	*Lupinus tidestromii*	E	E	1B.1	—	Partially stabilized dunes, immediately near the ocean.
Showy golden madia	*Madia radiata*	—	—	1B.1	—	Valley and foothill grassland, cismontane woodland.
Indian Valley bush-mallow	*Malcothamnus aboriginum*	—	—	1B.2	—	Granitic outcrops and sandy bare soil, often in disturbed soils.
Arcuate bush-mallow	*Malacothamnus arcuatus* var. *arcuatus*	—	—	1B.2	—	Chaparral, cismontane woodland.
Davidson's bush-mallow	*Malacothamnus davidsonii*	—	—	1B.2	—	Sandy washes.
Hall's bush-mallow	*Malacothamnus hallii*	—	—	1B.2	—	Chaparral, coastal scrub.
Oregon meconella	*Meconella oregana*	—	—	1B.1	—	Open, moist places.
Marsh microseris	*Microseris paludosa*	—	—	1B.2		Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland.
Northern curly-leaved monardella	*Monardella sinuata* ssp. *nigrescens*	—	—	1B.2	—	Coastal dunes, coastal scrub, chaparral, lower montane coniferous forest.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Woodland woollythreads	*Monolopia gracilens*	—	—	1B.2	—	Chaparral, valley and foothill grassland, cismontane woodland, broadleafed upland forest, north coast coniferous forest.
Lime Ridge navarretia	*Navarretia gowenii*	—	—	1B.1	—	Chaparral. On calcium carbonate-rich soil with high clay content.
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	—	—	1B.1	—	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest.
Few-flowered navarretia	*Navarretia leucocephala* ssp. *pauciflora*	E	T	1B.1	—	Volcanic ash flow, and volcanic substrate vernal pools.
Many-flowered navarretia	*Navarretia leucocephala* ssp. *plieantha*	E	E	1B.2	—	Vernal pools.
Shining navarretia	*Navarretia nigelliformis* ssp. *radians*	—	—	1B.2	—	Cismontane woodland, valley and foothill grassland, vernal pools.
Porter's navarretia	*Navarretia paradoxinota*	—	—	1B.3	—	Serpentinite, openings, vernally mesic, often drainages.
Prostrate vernal pool navarretia	*Navarretia prostrata*	—	—	1B.1	—	Coastal scrub, valley and foothill grassland, vernal pools, meadows and seeps.
Marin County navarretia	*Navarretia rosulata*	—	—	1B.2	—	Dry, open rocky places; can occur on serpentine.
Colusa grass	*Neostapfia colusana*	T	E	1B.1	—	Usually in the bottoms of large, or deep vernal pools; adobe soils.
Antioch Dunes evening-primrose	*Oenothera deltoides* ssp. *howellii*	E	E	1B.1	—	Interior dunes.
San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	T	E	1B.1	—	Vernal pools, wetland.
Kellman's bristle moss	*Orthotrichum kellmanii*	—	—	1B.2	—	Sandstone outcrops with high calcium concentrations from eroded boulders out of non-calcareous sandstone bedrock. Rock outcrops in small openings within dense chaparral with overstory of scattered *Pinus attenuata*.
Geysers panicum	*Panicum acuminatum* var. *thermale*	—	E	1B.2	—	Usually around moist, warm soil in the vicinity of hot springs.
Dudley's lousewort	*Pedicularis dudleyi*	—	R	1B.2	—	Deep shady woods of older coast redwood forests; also in maritime chaparral.
Sonoma beardtongue	*Penstemon newberryi* var. *sonomensis*	—	—	1B.3	—	Crevices in rock outcrops and talus slopes.
Santa Cruz Mountains beardtongue	*Penstemon rattanii* var. *kleei*	—	—	1B.2	—	Sandy shale slopes; sometimes in the transition between forest and chaparral.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	E	E	1B.1	—	Valley and foothill grassland, cismontane woodland.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
San Benito pentachaeta	*Pentachaeta exilis* ssp. *aeolica*	—	—	1B.2	—	Grassy areas.
North Coast phacelia	*Phacelia insularis* var. *continentis*	—	—	1B.2	—	Open maritime bluffs, sandy soil, sometimes rocky habitats.
Mt. Diablo phacelia	*Phacelia phacelioides*	—	—	1B.2	—	Adjacent to trails, on rock outcrops and talus slopes; sometimes on serpentine.
Monterey pine	*Pinus radiata*	—	—	1B.1	—	Closed-cone coniferous forest, cismontane woodland.
White-flowered rein orchid	*Piperia candida*	—	—	1B.2	—	Sometimes on serpentine. Forest duff, mossy banks, rock outcrops, and muskeg.
Point Reyes rein orchid	*Piperia elegans* ssp. *decurtata*	—	—	1B.1	—	Coastal bluff scrub, coastal prairie.
Choris' popcornflower	*Plagiobothrys chorisianus* var. *chorisianus*	—	—	1B.2	—	Chaparral, coastal scrub, coastal prairie.
San Francisco popcornflower	*Plagiobothrys diffusus*	—	E	1B.1	—	Valley and foothill grassland, coastal prairie.
Hairless popcornflower	*Plagiobothrys glaber*	—	—	1A	—	Meadows and seeps, marshes and swamps.
Bearded popcornflower	*Plagiobothrys hystriculus*	—	—	1B.1	—	Vernal pools, valley and foothill grassland.
Petaluma popcornflower	*Plagiobothrys mollis* var. *vestitus*	—	—	1A	—	Valley and foothill grassland, marshes and swamps.
Calistoga popcornflower	*Plagiobothrys strictus*	E	T	1B.1	—	Meadow and seep, valley and foothill grassland, vernal pool, wetland.
Hooked popcornflower	*Plagiobothrys uncinatus*	—	—	1B.2	—	Sandstone outcrops and canyon sides; often in burned or disturbed areas.
Warty popcornflower	*Plagiobothrys verrucosus*	—	—	2B.1	—	Chaparral. Shale substrate.
North Coast semaphore grass	*Pleuropogon hooverianus*	—	T	1B.1	—	Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments.
Napa blue grass	*Poa napensis*	E	E	1B.1	—	Meadows and seeps, valley and foothill grassland.
Oregon polemonium	*Polemonium carneum*	—	—	2B.2	—	Coastal prairie, coastal scrub, lower montane coniferous forest.
Eel-grass pondweed	*Potamogeton zosteriformis*	—	—	2B.2	—	Ponds, lakes, streams.
Hickman's cinquefoil	*Potentilla hickmanii*	E	E	1B.1	—	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps, marshes and swamps.
Cunningham Marsh cinquefoil	*Potentilla uliginosa*	—	—	1A	—	Found in permanent, oligotrophic wetlands.
California alkali grass	*Puccinellia simplex*	—	—	1B.2	—	Meadows and seeps, chenopod scrub, valley and foothill grasslands, vernal pools.
Tamalpais oak	*Quercus parvula* var. *tamalpaisensis*	—	—	1B.3	—	Lower montane coniferous forest.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Angel's hair lichen	*Ramalina thrausta*	—	—	2B.1	—	On dead twigs and other lichens.
Chaparral harebell	*Ravenella exigua*	—	—	1B.2		Rocky sites, usually on serpentine in chaparral.
Sharsmith's harebell	*Ravenella sharsmithiae*	—	—	1B.2		Chaparral. Serpentine barrens.
White beaked-rush	*Rhynchospora alba*	—	—	2B.2	—	Freshwater marshes and sphagnum bogs.
California beaked-rush	*Rhynchospora californica*	—	—	1B.1	—	Freshwater marsh, lower montane coniferous forest, marsh and swamp, meadow and seep, wetland.
Brownish beaked-rush	*Rhynchospora capitellata*	—	—	2B.2	—	Lower montane coniferous forest, marsh and swamp, meadow and seep, upper montane coniferous forest, wetland.
Round-headed beacked-rush	*Rhynchospora globularis*	—	—	2B.2	—	Freshwater marsh, marsh and swamp, wetland.
Sanford's arrowhead	*Sagittaria sanfordii*	—	—	1B.2	—	In standing or slow-moving freshwater ponds, marshes, and ditches.
Adobe sanicle	*Sanicula maritima*	—	R	1B.1		Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie.
Rock sanicle	*Sanicula saxatilis*	—	R	1B.2	—	Bedrock outcrops and talus slopes in chaparral or oak woodland habitat.
Marsh skullcap	*Scutellaria galericulata*	—	—	2B.2	—	Swamps and wet places.
Chaparral ragwort	*Senecio aphanactis*	—	—	2B.2		Chaparral, cismontane woodland, coastal scrub.
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*	—	—	1B.2	—	Marshes and swamps.
Napa checkerbloom	*Sidalcea hickmanii* ssp. *napensis*	—	—	1B.1	—	Chaparral. Rhyolitic substrates.
Marin checkerbloom	*Sidalcea hickmanii* ssp. *viridis*	—	—	1B.1	—	Chaparral, Ultramafic
Keck's checkerbloom	*Sidalcea keckii*	E	—	1B.1	—	Grassy slopes in blue oak woodland.
Purple-stemmed checkerbloom	*Sidalcea malviflora* ssp. *purpurea*	—	—	1B.2	—	Broadleafed upland forest, coastal prairie.
Marsh checkerbloom	*Sidalcea oregana* ssp. *hydrophila*	—	—	1B.2	—	Wet soil of streambanks, meadows.
Kenwood Marsh checkerbloom	*Sidalcea oregana* ssp. *valida*	E	E	1B.2	—	Edges of freshwater marshes.
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	—	—	2B.2	—	Coastal bluff scrub, coastal prairie, valley and foothill grassland.
San Francisco campion	*Silene verecunda* ssp. *verecunda*	—	—	1B.2	—	Coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral, coastal prairie.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Long-styled sand-spurrey	*Spergularia macrotheca* var. *longistyla*	—	—	1B.2	—	Marshes and swamps, meadows and seeps. Alkaline soils.
Santa Cruz microseris	*Stebbinsoseris decipiens*	—	—	1B.2	—	Open areas in loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes.
Metcalf Canyon jewelflower	*Streptanthus albidus* ssp. *albidus*	E	E	1B.1	—	Valley and foothill grassland.
Most beautiful jewelflower	*Streptanthus albidus* ssp. *peramoenus*	—	—	1B.2	—	Chaparral, valley and foothill grassland, cismontane woodland.
Mount Burdell jewelflower	*Streptanthus anomalus*	—	—	1B.1	—	Grassy openings, serpentinite.
Tamalpias jewelflower	*Streptanthus batrachopus*	—	—	1B.3	—	Talus serpentine outcrops.
Socrates Mine jewelflower	*Streptanthus brachiatus* ssp. *brachiatus*	—	—	1B.2	—	Serpentine areas and serpentine chaparral.
Freed's jewelflower	*Streptanthus brachiatus* ssp. *hoffmanii*	—	—	1B.2	—	Serpentine rock outcrops, primarily in geothermal development areas.
Mt. Hamilton jewelflower	*Streptanthus callistus*	—	—	1B.3	—	Open talus slopes on shale with gray pine and/or black oak.
Hoffman's bristly jewelflower	*Streptanthus glandulosus* ssp. *hoffmanii*	—	—	1B.3	—	Moist, steep rocky banks, in serpentine and non-serpentine soil.
Tiburon jewelflower	*Streptanthus glandulosus* ssp. *niger*	E	E	1B.1	—	Shallow, rocky serpentine slopes.
Mt. Tamalpais bristly jewelflower	*Streptanthus glandulosus* ssp. *pulchellus*	—	—	1B.2	—	Chaparral, valley and foothill grassland.
Green jewelflower	*Streptanthus hesperidis*	—	—	1B.2	—	Openings in chaparral or woodland; serpentine, rocky sites.
Mt. Diablo jewelflower	*Streptanthus hispidus*	—	—	1B.3	—	Valley and foothill grassland, chaparral. Talus or rocky outcrops.
Three Peaks jewelflower	*Streptanthus morrisonii* ssp. *elatus*	—	—	1B.2	—	Chaparral. Serpentine barrens, outcrops, and talus.
Dorr's Cabin jewelflower	*Streptanthus morrisonii* ssp. *hirtiflorus*	—	—	1B.2	—	Chaparral and closed-cone coniferous forest. On the serpentine barrens at the head of Austin Creek.
Kruckeberg's jewelflower	*Streptanthus morrisonii* ssp. *kruckebergii*	—	—	1B.2	—	Scattered serpentine outcrops near the Lake/Napa County line.
Morrison's jewelflower	*Streptanthus morrisonii* ssp. *morrisonii*	—	—	1B.2	—	Serpentine outcrops in the Austin Creek area.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Slender-leaved pondweed	*Stuckenia filiformis* ssp. *alpina*	—	—	2B.2	—	Marshes and swamps.
Broadleaf pondweed	*Stuckenia striata*	—	—	2B.3	—	Lakes, ponds, rivers, and drainage canals.
California seablite	*Suaeda californica*	E	E	1B.1	—	Marshes and swamps.
Twisted horsehair lichen	*Sulcaria spiralifera*	—	—	1B.1	—	North coast coniferous forest. Usually on conifers.
Suisun Marsh aster	*Symphyotrichum lentum*	—	—	1B.2	—	Marshes and swamps (brackish and freshwater).
Whiteworm lichen	*Thamnolia vermicularis*	—	—	2B.1	—	On rocks derived from Wilson Ranch formation sandstone.
Beaked tracyina	*Tracyina rostrata*	—	—	1B.2	—	Open grassy meadows within oak woodland and grassland habitats.
Napa bluecurls	*Trichostema ruygtii*	—	—	1B.2	—	Often in open, sunny areas. Also has been found in vernal pools.
Two-fork clover	*Trifolium amoenum*	E	E	1B.1	—	Valley and foothill grassland, coastal bluff scrub.
Santa Cruz clover	*Trifolium buckwestiorum*	—	—	1B.1	—	Moist grassland. Gravelly margins.
Saline clover	*Trifolium hydrophilum*	—	—	1B.2	—	Marshes and swamps, valley and foothill grassland, vernal pools.
Pacific Grove clover	*Trifolium polyodon*	—	R	1B.1	—	Along small springs and seeps in grassy openings.
San Francisco owl's-clover	*Triphysaria floribunda*	—	—	1B.2	—	Coastal prairie, coastal scrub, valley and foothill grassland.
Coastal triquetrella	*Triquetrella californica*	—	—	1B.2	—	Coastal bluff scrub, coastal scrub.
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	—	—	1B.1	—	Valley and foothill grassland.
Crampton's tuctoria or Solano grass	*Tuctoria mucronata*	E	E	1B.1	—	Clay bottoms of drying vernal pools and lakes in valley grassland.
Oval-leaved viburnum	*Viburnum ellipticum*	—	—	2B.3	—	Chaparral, cismontane woodland, lower montane coniferous forest.
Invertebrates						
Lange's metalmark butterfly	*Apodemia mormo langei*	E	—	—	—	Interior dunes.
Crotch bumble bee	*Bombus crotchii*	—	CE	—	—	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.
Western bumble bee	*Bombus occidentalis*	—	CE	—	—	Bumble bees have three basic habitat requirements: suitable nesting sites for the colonies, availability of nectar and pollen from floral resources throughout the duration of the colony period (spring, summer, and fall), and suitable overwintering sites for the queens.
Conservancy fairy shrimp	*Branchinecta conservatio*	E	—	—	—	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Longhorn fairy shrimp	*Branchinecta longiantenna*	E	—	—	—	Valley and foothill grassland, vernal pool, wetland. Endemic to the eastern margin of the Central Coast mountains in seasonally astatic grassland vernal pools. Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.
Vernal pool fairy shrimp	*Branchinecta lynchi*	T	—	—	—	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools.
San Bruno elfin butterfly	*Callophrys mossii bayensis*	E	—		—	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County.
Monarch	*Danaus plexippus*	P	—	—	—	Closed-cone coniferous forest. Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	—	—	—	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus nigra caerulea*).
Delta green ground beelte	*Elaphrus viridis*	T	—	—	—	Vernal pool, wetland. Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25-100 percent cover.
Smith's blue butterfly	*Euphilotes enoptes smithi*	E	—	—	—	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz counties. Hostplant: *Eriogonum latifolium* and *Eriogonum parvifolium* are utilized as both larval and adult foodplants.
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T	—	—	—	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay.
Vernal pool tadpole shrimp	*Lepidurus packardi*	E	—		—	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.
Mission blue butterfly	*Plebejus icarioides missionensis*	E	—	—	—	Inhabits grasslands of the San Francisco peninsula.
Callippe silverspot butterfly	*Speyeria callippe callippe*	E	—	—	—	Restricted to the northern coastal scrub of the San Francisco peninsula.
Behren's silverspot butterfly	*Speyeria zerene behrensii*	E	—	—	—	Restricted to the Pacific side of the Coast Ranges, from Point Arena to Cape Mendocino, Mendocino County. Inhabits coastal terrace prairie habitat. Foodplant is *Viola* spp.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	E	—	—	—	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County.
California freshwater shrimp	*Syncaris pacifica*	E	E	—	—	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy.
Zayante band-winged grasshopper	*Trimerotropis infantilis*	E	—	—	—	Chaparral, interior dunes. Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem). Mostly on sand parkland habitat but also in areas with well-developed ground cover and in sparse chaparral with grass.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Fish						
Sacramento perch	*Archoplites interruptus*	—	—	—	SSC	Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley.
Tidewater goby	*Eucyclogobius newberryi*	E	—	—	SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.
Delta smelt	*Hypomesus transpacificus*	T	E	—	—	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.
Russian River tule perch	*Hysterocarpus traski pomo*	—	—	—	SSC	Low elevation streams of the Russian River system.
Navarro roach	*Lavinia symmetricus navarroensis*	—	—	—	SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.
Gualala roach	*Lavinia symmetricus parvipinnis*	—	—	—	SSC	Found only in the Gualala River.
Tomales roach	*Lavinia symmetricus* ssp. *2*	—	—	—	SSC	Tributaries to Tomales Bay.
Monterey roach	*Lavinia symmetricus subditus*	—	—	—	SSC	Tributaries to Monterey Bay, specifically the Salinas, Pajaro, and San Lorenzo drainages.
Hardhead	*Mylopharodon conocephalus*	—	—	—	SSC	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River.
Coho salmon - central California coast ESU	*Oncorhynchus kisutch*	E	E	—	—	Aquatic.
Steelhead - central California coast DPS	*Oncorhynchus mykiss irideus*	T	—	—	—	Aquatic, Sacramento/San Joaquin flowing waters
Steelhead - south-central California coast DPS	*Oncorhynchus mykiss irideus*	T	—	—	—	Aquatic, Sacramento/San Joaquin flowing waters
Steelhead - Central Valley DPS	*Oncorhynchus mykiss irideus*	T	—	—	—	Aquatic, Sacramento/San Joaquin flowing waters
Sacramento splittail	*Pogonichthys macrolepidotus*	—	—	—	SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay and associated marshes.
Longfin smelt – San Francisco Bay DPS	*Spirinchus thaleichthys*	E	T	—	SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column.
Eulachon	*Thaleichthys pacificus*	T	—	—	—	Eulachon range from Monterey Bay, California, to the Bering Sea and Pribilof Islands. Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Amphibians and Reptiles						
Western pond turtle	*Actinemys marmorata*	P	—	—	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation.
California tiger salamander	*Ambystoma californiense*	T/E	T	—	—	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered.
Santa Cruz black salamander	*Aneides niger*	—	—	—	SSC	Mixed deciduous and coniferous woodlands and coastal grasslands in San Mateo, Santa Cruz, and Santa Clara counties. Adults found under rocks, talus, and damp woody debris.
Northern California legless lizard	*Anniella pulchra*	—	—	—	SSC	Sandy or loose loamy soils under sparse vegetation.
California glossy snake	*Arizona elegans occidentalis*	—	—	—	SSC	Patchily distributed from the eastern portion of San Francisco bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.
California giant salamander	*Dicamptodon ensatus*	—	—	—	SSC	Known from wet coastal forests near streams and seeps from Mendocino County south to Monterey County and east to Napa County.
Blunt-nosed leopard lizard	*Gambelia silus*	E	—	—	FP	Chenopod scrub. Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	—	—	—	SSC	Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites.
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	T	—	—	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats.
Coast horned lizard	*Phrynosoma blainvillii*	—	—	—	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.
Foothill yellow-legged frog – Central coast DPS	*Rana boylii*	T	E	—	SSC	San Francisco Peninsula and Diablo Range south of San Francisco Bay Estuary, and south through the Santa Cruz and Gabilan Mountains east of the Salinas River in the southern inner Coast Ranges. Partly shaded shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying and at least 15 weeks to attain metamorphosis.
Foothill yellow-legged frog – North Coast DPS	*Rana boylii*	—	—	—	SSC	Northern Coast Ranges north of San Francisco Bay Estuary, Klamath Mountains, and Cascade Range including watershed subbasins (HU 8) Lower Pit, Battle Creek, Thomes Creek, and Big Chico Creek in Lassen, Shasta, Tehama, and Butte counties. Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
California red-legged frog	*Rana draytonii*	T	—	—	SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation.
Western spadefoot	*Spea hammondii*	P	—	—	SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands.
Red-bellied newt	*Taricha rivularis*	—	—	—	SSC	Coastal drainages from Humboldt County south to Sonoma County, inland to Lake County. Isolated population of uncertain origin in Santa Clara County. Lives in terrestrial habitats, juveniles generally underground, adults active at surface in moist environments. Will migrate over 1 km to breed, typically in streams with moderate flow and clean, rocky substrate.
Giant gartersnake	*Thamnophis gigas*	T	T	—	—	Marsh and swamp, riparian scrub, wetland. Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.
San Francisco gartersnake	*Thamnophis sirtalis tetrataenia*	E	E	—	FP	Vicinity of freshwater marshes, ponds, and slow-moving streams in San Mateo County and extreme northern Santa Cruz County.
Birds						
Tricolored blackbird	*Agelaius tricolor*	—	T	—	SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California.
Grasshopper sparrow	*Ammodramus savannarum*	—	—	—	SSC	Valley and foothill grassland. Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.
Golden eagle	*Aquila chrysaetos*	—	—	—	FP	Rolling foothills, mountain areas, sage-juniper flats, and desert.
Short-eared owl	*Asio flammeus*	—	—	—	SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields.
Long-eared owl	*Asio otus*	—	—	—	SSC	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.
Burrowing owl	*Athene cunicularia*	—	CE	—	SSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.
Marbled murrelet	*Brachyramphus marmoratus*	T	E	—	—	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas fir.
Swainson's hawk	*Buteo swainsoni*	—	T	—	—	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees.
Mountain plover	*Charadrius montanus*	—	—	—	SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms. Short vegetation, bare ground and flat topography. Prefers grazed areas and areas with burrowing rodents.
Western snowy plover	*Charadrius alexandrinus nivosus*	T	—	—	SSC	Sandy beaches, salt pond levees and shores of large alkali lakes.
Northern harrier	*Circus hudsonius*	—	—		SSC	Coastal salt and fresh-water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	T	E		—	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.
Yellow rail	*Coturnicops noveboracensis*	—	—	—	SSC	Summer resident in eastern Sierra Nevada in Mono County. Fresh-water marshlands.
Black swift	*Cypseloides niger*	—	—	—	SSC	Coastal belt of Santa Cruz and Monterey Counties, central and southern Sierra Nevada, San Bernardino, and San Jacinto Mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf and forages widely
White-tailed kite	*Elanus leucurus*	—	—	—	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.
American peregrine falcon	*Falco peregrinus anatum*	D	D	—	—	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures.
Tufted puffin	*Fratercula cirrhata*	—	—	—	SSC	Protected deep water coastal communities. Open-ocean bird; nests along the coast on islands, islets, or (rarely) mainland cliffs. Requires sod or earth into which the birds can burrow, on island cliffs or grassy island slopes.
Saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	—	—	—	SSC	Resident of the San Francisco Bay region, in fresh and saltwater marshes.
California condor	*Gymnogyps californianus*	E	E	—	—	Chaparral, valley and foothill grassland. Require vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost or nest.
Bald eagle	*Haliaeetus leucocephalus*	D	E	—	FP	Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.
Yellow-breasted chat	*Icteria virens*	—	—	—	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.
Loggerhead shrike	*Lanius ludovicianus*	—	—	—	SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, riparian woodlands, desert oases, scrub, and washes.
California black rail	*Laterallus jamaicensis coturniculus*	—	T	—	FP	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays.
Song sparrow ("Modesto" population)	*Melospiza melodia*	—	—	—	SSC	Emergent freshwater marsh dominated by tules, and cattails; willow riparian scrub; valley oak riparian woodland with dense understory; and along vegetated irrigation canals and levees.
Suisun song sparrow	*Melospiza melodia maxillaris*	—	—	—	SSC	Resident of brackish-water marshes surrounding Suisun Bay.
Alameda song sparrow	*Melospiza melodia pusillula*	—	—	—	SSC	Resident of salt marshes bordering south arm of San Francisco Bay.
San Pablo song sparrow	*Melospiza melodia samuelis*	—	—	—	SSC	Resident of salt marshes along the north side of San Francisco and San Pablo bays.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Ashy storm-petrel	Oceanodroma homochroa	—	—	—	SSC	Protected deep water coastal communities. Colonial nester on off-shore islands. Usually nests on driest part of islands. Forages over open ocean. Nest sites on islands are in crevices beneath loosely piled rocks or driftwood, or in caves.
California brown pelican	Pelecanus occidentalis californicus	D	D	—	—	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.
Purple martin	Progne subis	—	—	—	SSC	Broadleaved upland forest and lower montane coniferous forest.
California Ridgway's rail	Rallus obsoletus obsoletus	E	E	—	FP	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.
Bank swallow	Riparia riparia	—	T		—	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.
Black skimmer	Rynchops niger	—	—	—	SSC	Nests on gravel bars, low islets, and sandy beaches, in unvegetated sites. Nesting colonies usually less than 200 pairs.
Yellow warbler	Setophaga petechia	—	—	—	SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada.
California least tern	Sternula antillarum browni	E	E	—	FP	Nests along the coast from San Francisco Bay south to northern Baja California.
Northern spotted owl	Strix occidentalis caurina	T	T	—	—	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. High, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.
Least Bell's vireo	Vireo bellii pusillus	E	E	—	—	Riparian forest, riparian scrub, riparian woodland. Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.
Yellow-headed blackbird	Xanthocephalus xanthocephalus	—	—	—	SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.
Mammals						
Pallid bat	Antrozous pallidus	—	—	—	SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.
Point Arena mountain beaver	Aplodontia rufa nigra	E	—	—	—	Coastal areas of Point Arena with springs or seepages. North-facing slopes of ridges and gullies with friable soils and thickets of undergrowth.
Point Reyes mountain beaver	Aplodontia rufa phaea	—	—	—	SSC	Coastal scrub, Meadow and seep.
Sonoma tree vole	Arborimus pomo	—	—	—	SSC	North coast fog belt from Oregon border to Sonoma County. In Douglas fir, redwood, and montane hardwood-conifer forests. Feeds almost exclusively on Douglas fir needles. Will occasionally take needles of grand fir, hemlock or spruce.
Northern California ringtail	Bassariscus astutus raptor	—	—	—	FP	Riparian habitats, forest habitats, and shrub habitats in lower to middle elevations. Usually found within 0.6 mile of a permanent water source.

Common Name	Scientific Name	Status				Habitat Associations
		FESA	CESA	CRPR	Other	
Townsend's big-eared bat	*Corynorhinus townsendii*	—	—	—	SSC	Throughout California in a wide variety of habitats. Most common in mesic sites.
Southern sea otter	*Enhydra lutris nereis*	T	T	—	FP	Nearshore marine environments from about Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.
Western mastiff bat	*Eumops perotis californicus*	—	—	—	SSC	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral.
Western red bat	*Lasiurus frantzii*	—	—	—	SSC	Roosts primarily in trees, 2 to 40 ft above ground, from sea level up through mixed conifer forests.
San Pablo vole	*Microtus californicus sanpabloensis*	—	—	—	SSC	Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay.
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	—	—	—	SSC	Forest habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats.
Big free-tailed bat	*Nyctinomops macrotis*	—	—	—	SSC	Low-lying arid areas in Southern California.
Mountain lion	*Puma concolor*	—	CT	—	—	Mountain lions inhabit a wide range of ecosystems, including mountainous regions, forests, deserts, and wetlands. Mountain lions establish and defend large territories and can travel large distances in search of prey or mates. The Central Coast and Southern California Evolutionarily Significant Units (ESUs) were granted emergency listing status in April of 2020, and CDFW is currently reviewing a petition to list these ESUs as threatened under CESA. These ESUs include portions of Solano, Contra Costa, Marin, San Francisco, Alameda, Santa Clara, and San Mateo Counties.
Salt-marsh harvest mouse	*Reithrodontomys raviventris*	E	E	—	FP	Only in the saline emergent wetlands of San Francisco Bay and its tributaries.
Alameda Island mole	*Scapanus latimanus parvus*	—	—	—	SSC	Only known from Alameda Island. Found in a variety of habitats, especially annual and perennial grasslands.
Suisun shrew	*Sorex ornatus sinuosus*	—	—	—	SSC	Tidal marshes of the northern shores of San Pablo and Suisun bays.
Salt-marsh wandering shrew	*Sorex vagrans halicoetes*	—	—	—	SSC	Salt marshes of the south arm of San Francisco Bay.
American badger	*Taxidea taxus*	—	—	—	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.
San Joaquin kit fox	*Vulpes macrotis mutica*	E	T	—	—	Annual grasslands or grassy open stages with scattered shrubby vegetation.
Point Reyes jumping mouse	*Zapus trinotatus orarius*	—	—	—	SSC	Coastal scrub, marsh and swamp, meadow and seep, valley and foothill grassland. Primarily in bunch grass marshes on the uplands of Point Reyes. Also present in coastal scrub, grassland, and meadows. Eats mainly grass seeds with some insects and fruit taken. Builds grassy nests on ground under vegetation and burrows in winter.

Status:
Federal Endangered Species Act (FESA):
E = Endangered
T = Threatened
D = Delisted
P = Proposed for Listing
California Endangered Species Act (CESA):

CE = Candidate Endangered
CT = Candidate Threatened
D = Delisted
E = Endangered
R = Rare
T = Threatened

California Rare Plant Rank (CRPR) category descriptions:
1A = Plants presumed extinct in California and rare/extinct elsewhere
1B = Plants considered rare or endangered in California and elsewhere
2A = Plants presumed extirpated in California, but more common elsewhere
2B = Plants considered rare or endangered in California, but more common elsewhere.

CRPR Threat Ranks:
.1 Seriously threatened in California (> 80 percent of occurrences threatened and/or high degree and immediacy of threat)
.2 Moderately threatened in California (20 to 80 percent of occurrences threatened/moderate degree and immediacy of threat)
.3 Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Other:
FP = California Department of Wildlife Fully Protected
SSC = California Department of Fish and Wildlife Species of Special Concern

Source: CNDDB 2025, CNPS 2025, USFWS 2025.

Appendix D

Air Quality, Greenhouse Gases Emissions, and Energy Modeling Outputs

Model	Regulation	Description
EMFAC 2017	Phase 2 GHG standards	On August 16, 2016, the U.S. EPA and NHTSA released a prepublication version of the Phase 2 standards. The final version of the Phase 2 rule was published in October 25, 2016. The Phase 2 standards are the second phase of federal heavy– duty GHG standards and build upon the Phase 1 standards. The regulation imposes new requirements for newly manufactured compression and spark ignited engines in Class 2b through Class 8 vehicles. Phase 2 requirements begin with model year 2018 for trailers and model year 2021 for engines and vehicles, and phase–in through 2027 model year
	Senate Bill 1	The Road Repair and Accountability Act of 2017, is intended to address the funding deficit for transportation infrastructure, and the backlog of California transportation system maintenance and rehabilitation projects. Besides addressing the funding deficit, the bill requires the Department of Motor Vehicles (DMV), starting January 1, 2020, to verify that a medium-duty or heavy-duty vehicle is compliant with or exempt from CARB's Truck and Bus Regulation (Section 2025 of Title 13 of the California Code of Regulations) before allowing registration. Following this bill, the compliance assumptions in EMFAC2017 model were updated to ensure that full compliance will be achieved by January 1, 2023
	Advanced Clean Cars	EMFAC2017 incorporates updates to assumptions on Advanced Clean Cars (ACC) regulation based on the 2017 Midterm review of ACC. These updates include: Updates to Zero Emission Vehicle sales forecast, Updated CO2 emission rate and fuel efficiency forecasts, Updated criteria technology penetration (i.e., SULEV30, ULEV125) , Updated in-use emission factors for vehicles certified to 3 and 1 mg/mi PM emission standards
EMFAC 2021	HD Warranty phase 1 (Section 4.6.5):	In 2018, CARB adopted amendments to the heavy duty engine (above 14,000 lbs.) warranty regulation and further updated those warranty mileages through the CARB's HD Omnibus regulation. NOx and PM emissions reductions from these programs are incorporated into EMFAC2021.
	Innovative Clean Transit (ICT) (Section 4.2.3):	Adopted in 2018, ICT regulation is a program that enhance public health by improving air quality and to mitigate climate change by transforming California transit bus fleets to zero-emissions technologies. This regulation applies to all transit agencies that own, operate, or lease buses with GVWR above 14,000 lbs. It requires all public transit agencies to gradually transition to a 100% zero-emission bus fleet and encourages them to provide innovative first and last-mile connectivity and improved mobility for transit riders. The zero emissions buses introduced through this program are reflected in EMFAC2021.
	Amendments to Heavy-Duty Vehicle Inspection Program (HDVIP) and Periodic Smoke Inspection Program (PSIP) (Section 4.6):	CARB adopted amendments to the HDVIP and PSIP programs in 2019. This program reduces particulate matter (PM) from diesel-powered vehicles (GVWR above 14,000 lbs.) and it will be achieved through more stringent opacity limit for non-DPF and DPF-equipped vehicles. PM reductions from this program are reflected in EMFAC2021.
	Advanced Clean Truck (ACT) (Section 4.5.3)	Adopted in 2020, ACT requires manufacturers of Class 2b-8 chassis or complete vehicles with combustion engines to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 vocational truck sales, and 40% of Class 7-8 truck tractor sales. EMFAC2021 reflects ACT by modelling heavy-duty zero emission vehicles (ZEVs) based on the sales percentage requirements for each model year and those percentages were applied to vehicles first sold or certified in California.
	Heavy-Duty (HD) Omnibus (Section 4.6.4)	EMFAC2021 reflects NOx emissions reductions from Heavy Duty Omnibus regulation adopted in August 2020. HD Omnibus represents a comprehensive update to heavy-duty NOx emissions standards and ensures that heavy-duty engines will emit much lower NOx emissions throughout their lifetimes.

Model	Regulation	Description
EMFAC 2021	SAFE Vehicle Rules and Actions (Section 4.6.1)	In April 2020, the federal agencies issued the SAFE Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (Final SAFE Rule) that relaxed federal greenhouse gas emissions and fuel economy standards, 85 Fed. Reg. 24,174 (Apr. 30, 2020). The Final SAFE Rule relaxed federal greenhouse gas emissions and Corporate Average Fuel Economy (CAFE) standards to increase in stringency at only about 1.5% per year from model year (MY) 2020 levels over MYs 2021–2026. CARB has updated the carbon dioxide emission factors for gasoline-fueled passenger cars and light-duty trucks in EMFAC2021 to reflect the impacts of both the SAFE Part One and the Final SAFE Rule. CARB has additionally updated EMFAC2021 model to reflect the expected impact of California's Framework Agreements on Clean Cars

Share of Modeled VMT by Speed

	Alameda		Contra Costa		Marin		Napa		San Francisco		San Mateo		Santa Clara		Solano		Sonoma		Grand Total	
Speed Bin MPH	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**	**2023**	**2050**
0–5 MPH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
5–10 MPH	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.5%
10–15 MPH	0.1%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.2%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%
15–20 MPH	0.2%	1.4%	0.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.4%	1.5%	0.1%	0.8%	0.2%	2.5%	0.0%	0.0%	0.0%	0.2%	1.0%	6.9%
20–25 MPH	0.8%	2.7%	0.2%	1.3%	0.0%	0.1%	0.0%	0.1%	0.9%	0.9%	0.4%	1.3%	0.6%	4.1%	0.1%	0.3%	0.1%	0.3%	3.0%	11.0%
25–30 MPH	5.2%	5.3%	3.2%	3.7%	0.6%	1.0%	0.3%	0.4%	1.8%	0.4%	2.1%	1.8%	7.6%	4.6%	1.0%	1.4%	1.6%	2.0%	23.3%	20.7%
30–35 MPH	2.8%	0.6%	1.8%	1.2%	0.6%	0.2%	0.4%	0.4%	0.1%	0.1%	1.0%	0.6%	2.0%	1.3%	0.7%	0.4%	1.3%	1.4%	10.6%	6.3%
35–40 MPH	0.7%	0.5%	1.1%	0.4%	0.1%	0.1%	0.2%	0.0%	0.1%	0.1%	0.3%	0.2%	0.5%	0.9%	0.5%	0.2%	0.9%	0.1%	4.5%	2.4%
40–45 MPH	0.5%	0.7%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.5%	0.6%	2.9%	3.3%	0.1%	0.3%	0.0%	0.0%	4.7%	5.6%
45–50 MPH	1.2%	2.1%	0.4%	0.5%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.5%	0.8%	1.3%	1.7%	0.3%	0.7%	0.2%	0.1%	4.1%	6.3%
50–55 MPH	1.5%	9.3%	0.8%	5.2%	0.0%	1.3%	0.3%	0.6%	0.3%	1.1%	0.7%	3.6%	1.7%	7.4%	0.3%	3.4%	0.1%	1.1%	5.7%	32.9%
55–60 MPH	4.4%	1.2%	1.9%	0.9%	0.6%	0.5%	0.0%	0.1%	1.0%	0.2%	2.6%	0.7%	4.3%	1.2%	0.6%	0.7%	0.4%	0.7%	15.8%	6.2%
60–65 MPH	7.0%	0.0%	4.3%	0.0%	1.6%	0.0%	0.4%	0.0%	0.2%	0.0%	2.3%	0.0%	5.1%	0.0%	4.4%	0.0%	1.7%	0.0%	27.1%	0.0%
Grand Total	**24.4%**	**24.4%**	**14.1%**	**13.8%**	**3.6%**	**3.3%**	**1.8%**	**1.7%**	**5.3%**	**5.1%**	**10.5%**	**10.8%**	**26.1%**	**27.7%**	**7.9%**	**7.4%**	**6.3%**	**5.9%**	**100.0%**	**100.0%**

EMFAC2021 Assumptions by County

County	Veh Tech		Pollutant				
			Population	Trips	C Vmt	E Vmt	Total VMT
Alameda	All Vehicles	2023 annual	959,547	4,900,473	34,271,961	1,840,844	36,112,805
		2050 annual	1,160,834	6,050,193	38,249,357	5,664,974	43,914,331
Contra Costa	All Vehicles	2023 annual	556,384	2,792,562	20,425,321	805,648	21,230,969
		2050 annual	649,444	3,279,397	22,059,734	3,123,437	25,183,170
Marin	All Vehicles	2023 annual	156,380	776,593	5,136,880	284,751	5,421,631
		2050 annual	185,877	928,375	5,207,166	778,590	5,985,756
Napa	All Vehicles	2023 annual	70,607	372,393	2,678,784	88,641	2,767,425
		2050 annual	76,601	392,442	2,766,838	410,094	3,176,932
San Francisco	All Vehicles	2023 annual	222,016	1,111,467	7,462,325	391,113	7,853,438
		2050 annual	260,605	1,325,034	7,886,394	1,252,580	9,138,974
San Mateo	All Vehicles	2023 annual	469,495	2,385,716	14,777,659	733,701	15,511,360
		2050 annual	863,435	4,395,736	17,090,880	2,353,566	19,444,446
Santa Clara	All Vehicles	2023 annual	1,050,681	5,257,141	36,247,247	2,301,633	38,548,880
		2050 annual	1,430,896	7,257,844	43,448,498	6,309,400	49,757,898
Solano	All Vehicles	2023 annual	289,348	1,491,357	11,414,677	335,144	11,749,821
		2050 annual	298,608	1,564,506	11,835,769	1,649,048	13,484,816
Sonoma	All Vehicles	2023 annual	267,133	1,407,132	9,341,213	348,204	9,689,417
		2050 annual	311,512	1,584,619	9,605,466	1,529,983	11,135,450
Total		**2023 annual**	**4,041,591**	**20,494,834**	**141,756,067**	**7,129,679**	**148,885,746**
		2050 annual	**5,237,812**	**26,778,148**	**158,150,102**	**23,071,673**	**181,221,775**

EMFAC2017 Assumptions by County

County	Veh Tech		Pollutant		
			Population	Trips	VMT
Alameda	All Vehicles	2023 annual	988,909	4,946,659	36,112,805
		2050 annual	1,410,651	7,037,877	43,914,331
Contra Costa	All Vehicles	2023 annual	578,405	2,861,342	21,230,969
		2050 annual	802,844	3,943,633	25,183,170
Marin	All Vehicles	2023 annual	165,894	816,950	5,421,631
		2050 annual	222,663	1,089,787	5,985,756
Napa	All Vehicles	2023 annual	72,317	366,954	2,767,425
		2050 annual	93,377	458,409	3,176,932
San Francisco	All Vehicles	2023 annual	238,358	1,183,144	7,853,438
		2050 annual	335,162	1,667,860	9,138,974
San Mateo	All Vehicles	2023 annual	519,904	2,622,444	15,511,360
		2050 annual	925,969	4,640,007	19,444,446
Santa Clara	All Vehicles	2023 annual	1,118,229	5,533,787	38,548,880
		2050 annual	1,750,199	8,612,560	49,757,898
Solano	All Vehicles	2023 annual	301,402	1,513,854	11,749,821
		2050 annual	388,687	1,925,355	13,484,816
Sonoma	All Vehicles	2023 annual	274,945	1,400,759	9,689,417
		2050 annual	367,100	1,808,724	11,135,450
Total		**2023 annual**	**4,258,362**	**21,245,892**	**148,885,746**
		2050 annual	**6,296,652**	**31,184,212**	**181,221,775**

EMFAC2021 Assumptions by Veh Tech

Veh Group	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050
Passenger Cars and Light-Duty Trucks	LDA-Dsl	7,953	1,322	33,707	5,925	229,084	43,283	-	-	229,084	43,283
	LDA-Elec	129,982	290,329	643,675	1,357,513	-	-	5,594,786	10,877,359	5,594,786	10,877,359
	LDA-Gas	1,888,732	2,071,296	8,750,003	9,641,285	69,207,323	74,094,720	-	-	69,207,323	74,094,720
	LDA-Phe	47,457	97,892	196,235	404,782	1,074,916	1,441,915	1,043,264	2,098,585	2,118,180	3,540,500
	LDT1-Dsl	108	2	313	8	1,348	58	-	-	1,348	58
	LDT1-Elec	485	4,776	2,282	22,236	-	-	17,831	169,601	17,831	169,601
	LDT1-Gas	187,929	149,654	832,965	681,137	6,115,214	4,787,527	-	-	6,115,214	4,787,527
	LDT1-Phe	143	3,625	592	14,987	3,191	49,435	3,729	72,085	6,920	121,519
	LDT2-Dsl	3,517	4,854	16,732	22,367	135,125	159,718	-	-	135,125	159,718
	LDT2-Elec	3,578	51,386	18,339	240,315	-	-	126,127	1,278,426	126,127	1,278,426
	LDT2-Gas	893,315	1,259,552	4,187,743	5,810,759	33,285,155	41,552,102	-	-	33,285,155	41,552,102
	LDT2-Phe	5,567	34,871	23,021	144,191	124,704	472,807	134,837	688,269	259,541	1,161,076
	MCY-Gas	100,661	121,351	201,321	242,701	579,428	630,194	-	-	579,428	630,194
	MDV-Dsl	8,412	8,086	39,734	36,758	318,783	257,002	-	-	318,783	257,002
	MDV-Elec	3,721	47,423	19,105	220,543	-	-	131,839	1,161,646	131,839	1,161,646
	MDV-Gas	515,478	730,591	2,383,842	3,350,565	18,527,163	23,648,365	-	-	18,527,163	23,648,365
	MDV-Phe	3,248	22,309	13,430	92,247	72,528	296,349	73,765	431,386	146,292	727,735
Trucks	LHD1-Dsl	42,065	32,614	529,122	410,242	1,612,210	1,054,165	-	-	1,612,210	1,054,165
	LHD1-Elec		69,042		966,989		-		2,633,507		2,633,507
	LHD1-Gas	71,165	49,595	1,060,248	738,887	2,653,300	1,633,112	-	-	2,653,300	1,633,112
	LHD2-Dsl	17,102	16,221	215,122	204,034	679,999	498,538	-	-	679,999	498,538
	LHD2-Elec		17,291		228,759		-		638,810		638,810
	LHD2-Gas	9,250	5,864	137,816	87,365	339,881	187,952	-	-	339,881	187,952
	PTO-Dsl					80,003	55,233	-	-	80,003	55,233
	PTO-Elec					-	-	32	61,463	32	61,463
	T6 CAIRP Class 4-Dsl	14	8	310	178	898	546	-	-	898	546
	T6 CAIRP Class 4-Elec	0	11	0	261	-	-	1	829	1	829
	T6 CAIRP Class 5-Dsl	18	9	417	218	1,232	749	-	-	1,232	749
	T6 CAIRP Class 5-Elec	0	14	0	319	-	-	1	1,137	1	1,137
	T6 CAIRP Class 6-Dsl	57	43	1,313	995	3,216	1,954	-	-	3,216	1,954
	T6 CAIRP Class 6-Elec	0	64	3	1,463	-	-	4	2,975	4	2,975
	T6 CAIRP Class 7-Dsl	99	119	2,267	2,733	20,185	23,383	-	-	20,185	23,383
	T6 CAIRP Class 7-Elec	0	37	2	852	-	-	10	7,532	10	7,532
	T6 Instate Delivery Class 4-Dsl	2,620	1,777	37,390	25,353	88,803	58,786	-	-	88,803	58,786
	T6 Instate Delivery Class 4-Elec	2	2,215	22	31,603	-	-	29	76,556	29	76,556
	T6 Instate Delivery Class 4-NG	8	25	108	353	286	821	-	-	286	821
	T6 Instate Delivery Class 5-Dsl	2,117	1,474	30,204	21,030	73,403	48,761	-	-	73,403	48,761
	T6 Instate Delivery Class 5-Elec	1	1,842	16	26,286	-	-	20	63,640	20	63,640
	T6 Instate Delivery Class 5-NG	5	20	70	290	183	675	-	-	183	675
	T6 Instate Delivery Class 6-Dsl	5,321	3,655	75,928	52,158	183,516	120,977	-	-	183,516	120,977
	T6 Instate Delivery Class 6-Elec	3	4,567	50	65,176	-	-	64	157,795	64	157,795
	T6 Instate Delivery Class 6-NG	12	50	173	719	448	1,677	-	-	448	1,677
	T6 Instate Delivery Class 7-Dsl	1,033	1,000	14,736	14,265	57,088	50,658	-	-	57,088	50,658
	T6 Instate Delivery Class 7-Elec	0	711	5	10,145	-	-	8	37,611	8	37,611
	T6 Instate Delivery Class 7-NG	24	21	337	294	1,327	1,037	-	-	1,327	1,037
	T6 Instate Other Class 4-Dsl	3,828	2,598	44,255	30,034	156,426	100,811	-	-	156,426	100,811
	T6 Instate Other Class 4-Elec	1	3,219	8	37,217	-	-	14	135,987	14	135,987
	T6 Instate Other Class 4-NG	8	36	97	412	384	1,394	-	-	384	1,394
	T6 Instate Other Class 5-Dsl	8,286	6,029	95,792	69,699	364,753	234,967	-	-	364,753	234,967
	T6 Instate Other Class 5-Elec	4	7,476	43	86,419	-	-	77	317,260	77	317,260
	T6 Instate Other Class 5-NG	18	82	205	949	783	3,237	-	-	783	3,237
	T6 Instate Other Class 6-Dsl	6,906	4,880	79,831	56,418	295,793	190,203	-	-	295,793	190,203
	T6 Instate Other Class 6-Elec	4	6,054	51	69,984	-	-	92	256,730	92	256,730
	T6 Instate Other Class 6-NG	13	67	151	772	571	2,633	-	-	571	2,633
	T6 Instate Other Class 7-Dsl	3,532	3,576	40,824	41,341	170,335	140,440	-	-	170,335	140,440
	T6 Instate Other Class 7-Elec	1	2,401	13	27,751	-	-	35	119,502	35	119,502
	T6 Instate Other Class 7-NG	81	73	935	841	4,254	2,764	-	-	4,254	2,764
	T6 Instate Tractor Class 6-Dsl	43	30	496	351	2,167	1,407	-	-	2,167	1,407
	T6 Instate Tractor Class 6-Elec	0	38	0	435	-	-	0	1,934	0	1,934
	T6 Instate Tractor Class 6-NG	0	0	1	5	6	20	-	-	6	20
	T6 Instate Tractor Class 7-Dsl	1,007	1,349	11,637	15,591	62,788	76,442	-	-	62,788	76,442
	T6 Instate Tractor Class 7-Elec	0	293	3	3,384	-	-	10	19,148	10	19,148
	T6 Instate Tractor Class 7-NG	22	26	253	305	1,455	1,474	-	-	1,455	1,474
	T6 OOS Class 4-Dsl	8	11	183	261	525	801	-	-	525	801
	T6 OOS Class 5-Dsl	11	14	245	320	721	1,099	-	-	721	1,099
	T6 OOS Class 6-Dsl	34	63	775	1,456	1,884	2,872	-	-	1,884	2,872
	T6 OOS Class 7-Dsl	55	77	1,259	1,777	13,696	20,882	-	-	13,696	20,882
	T6 Public Class 4-Dsl	494	259	2,533	1,327	16,518	8,981	-	-	16,518	8,981
	T6 Public Class 4-Elec	0	277	0	1,422	-	-	1	10,587	1	10,587
	T6 Public Class 4-NG	12	18	63	91	527	617	-	-	527	617
	T6 Public Class 5-Dsl	893	542	4,583	2,779	33,205	18,732	-	-	33,205	18,732
	T6 Public Class 5-Elec	0	571	0	2,930	-	-	2	21,772	2	21,772
	T6 Public Class 5-NG	51	39	263	199	2,143	1,331	-	-	2,143	1,331
	T6 Public Class 6-Dsl	622	347	3,190	1,781	21,570	12,011	-	-	21,570	12,011
	T6 Public Class 6-Elec	0	368	2	1,886	-	-	7	13,984	7	13,984
	T6 Public Class 6-NG	28	25	144	130	1,182	869	-	-	1,182	869

Veh Group	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050
	T6 Public Class 7-Dsl	1,345	882	6,899	4,526	59,449	37,290	-	-	59,449	37,290
	T6 Public Class 7-Elec	1	725	3	3,717	-	-	15	33,778	15	33,778
	T6 Public Class 7-NG	52	63	269	323	2,904	2,651	-	-	2,904	2,651
	T6 Utility Class 5-Dsl	389	184	4,977	2,354	15,831	7,386	-	-	15,831	7,386
	T6 Utility Class 5-Elec		283		3,623		-		11,552		11,552
	T6 Utility Class 5-NG	5	1	65	19	201	59	-	-	201	59
	T6 Utility Class 6-Dsl	76	36	978	459	3,086	1,440	-	-	3,086	1,440
	T6 Utility Class 6-Elec		55		706		-		2,252		2,252
	T6 Utility Class 6-NG	1	0	14	4	42	11	-	-	42	11
	T6 Utility Class 7-Dsl	84	39	1,072	495	4,138	1,922	-	-	4,138	1,922
	T6 Utility Class 7-Elec	0	59	2	762	-	-	4	3,057	4	3,057
	T6 Utility Class 7-NG	2	0	21	4	73	15	-	-	73	15
	T6TS-Elec		3,299		66,011		-		195,457		195,457
	T6TS-Gas	5,613	3,047	112,313	60,964	291,323	143,858	-	-	291,323	143,858
	T7 CAIRP Class 8-Dsl	4,192	5,595	96,340	128,577	852,856	1,149,825	-	-	852,856	1,149,825
	T7 CAIRP Class 8-Elec	9	1,553	209	35,683	-	-	949	330,389	949	330,389
	T7 CAIRP Class 8-NG	8	9	178	203	1,615	1,814	-	-	1,615	1,814
	T7 NNOOS Class 8-Dsl	3,761	6,197	86,426	142,414	1,011,659	1,752,597	-	-	1,011,659	1,752,597
	T7 NOOS Class 8-Dsl	1,575	2,673	36,194	61,415	367,634	636,886	-	-	367,634	636,886
	T7 Other Port Class 8-Dsl	371	384	6,072	6,283	69,644	91,272	-	-	69,644	91,272
	T7 Other Port Class 8-Elec	0	89	3	1,449	-	-	18	22,986	18	22,986
	T7 POAK Class 8-Dsl	2,389	2,952	39,083	48,300	240,254	339,967	-	-	240,254	339,967
	T7 POAK Class 8-Elec	1	690	24	11,285	-	-	62	78,551	62	78,551
	T7 POAK Class 8-NG	1	7	16	108	96	760	-	-	96	760
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0
	T7 Public Class 8-Dsl	2,993	2,042	15,353	10,475	129,379	82,686	-	-	129,379	82,686
	T7 Public Class 8-Elec	1	1,546	6	7,930	-	-	35	70,301	35	70,301
	T7 Public Class 8-NG	12	16	63	82	617	650	-	-	617	650
	T7 Single Concrete/Transit Mix Class 8-Dsl	701	372	6,603	3,501	49,670	24,929	-	-	49,670	24,929
	T7 Single Concrete/Transit Mix Class 8-Elec	1	529	10	4,981	-	-	41	36,939	41	36,939
	T7 Single Concrete/Transit Mix Class 8-NG	42	23	393	212	3,034	1,512	-	-	3,034	1,512
	T7 Single Dump Class 8-Dsl	2,463	1,776	23,199	16,733	151,752	89,106	-	-	151,752	89,106
	T7 Single Dump Class 8-Elec	0	1,645	3	15,494	-	-	12	98,447	12	98,447
	T7 Single Dump Class 8-NG	143	108	1,345	1,013	9,344	5,377	-	-	9,344	5,377
	T7 Single Other Class 8-Dsl	3,181	3,551	29,968	33,449	178,448	148,372	-	-	178,448	148,372
	T7 Single Other Class 8-Elec	3	3,566	32	33,589	-	-	109	174,156	109	174,156
	T7 Single Other Class 8-NG	180	212	1,700	1,999	10,665	8,867	-	-	10,665	8,867
	T7 SWCV Class 8-Dsl	1,149	105	5,285	485	74,531	6,757	-	-	74,531	6,757
	T7 SWCV Class 8-Elec	0	1,256	2	5,777	-	-	11	81,292	11	81,292
	T7 SWCV Class 8-NG	1,138	1,356	5,234	6,239	73,631	87,993	-	-	73,631	87,993
	T7 Tractor Class 8-Dsl	8,181	15,421	118,865	224,069	648,207	973,457	-	-	648,207	973,457
	T7 Tractor Class 8-Elec	7	3,213	96	46,690	-	-	274	219,534	274	219,534
	T7 Tractor Class 8-NG	1,025	1,255	14,898	18,231	82,497	79,045	-	-	82,497	79,045
	T7 Utility Class 8-Dsl	284	195	3,636	2,497	13,138	8,070	-	-	13,138	8,070
	T7 Utility Class 8-Elec	0	163	1	2,085	-	-	2	7,483	2	7,483
	T7IS-Elec		4		90		-		627		627
	T7IS-Gas	20	4	407	89	1,701	503	-	-	1,701	503
Buses	All Other Buses-Dsl	2,631	3,851	23,417	34,275	157,857	188,978	-	-	157,857	188,978
	All Other Buses-NG	26	76	231	677	1,472	3,833	-	-	1,472	3,833
	Motor Coach-Dsl	325	448	7,478	10,296	46,364	56,436	-	-	46,364	56,436
	OBUS-Elec		566		11,321		-		34,350		34,350
	OBUS-Gas	1,975	742	39,509	14,855	101,774	25,704	-	-	101,774	25,704
	SBUS-Dsl	2,215	1,128	32,079	16,327	51,556	24,006	-	-	51,556	24,006
	SBUS-Elec		401		20,559		-		51,200	-	51,200
	SBUS-Gas	513	388	2,053	1,554	27,048	19,221	-	-	27,048	19,221
	SBUS-NG	108	67	1,557	966	2,732	1,424	-	-	2,732	1,424
	UBUS-Dsl	2,194	32	8,776	126	214,630	1,225	-	-	214,630	1,225
	UBUS-Elec	30	2,711	121	10,843	-	-	1,562	263,205	1,562	263,205
	UBUS-Gas	623	557	2,493	2,227	44,311	39,377	-	-	44,311	39,377
	UBUS-NG	278	13	1,112	51	26,310	495	-	-	26,310	495
All Other Vehicles	MH-Dsl	3,481	4,366	348	437	34,454	38,829	-	-	34,454	38,829
	MH-Gas	8,626	6,843	863	685	78,518	69,011	-	-	78,518	69,011
Total		**4,041,591**	**5,237,812**	**20,494,834**	**26,778,148**	**141,756,067**	**158,150,102**	**7,129,679**	**23,071,673**	**148,885,746**	**181,221,775**

EMFAC2017 Assumptions by Veh Tech

Veh Group	Veh Tech	Population		Trips		VMT	
		2023	2050	2023	2050	2023	2050
Passenger Cars and Light-Duty Trucks	LDA - DSL	26,043	40,191	121,994	187,976	931,658	1,180,492
	LDA - GAS	2,323,299	3,437,225	10,936,832	16,071,814	82,793,344	101,133,613
	LDT1 - DSL	139	52	458	238	2,289	1,386
	LDT1 - GAS	248,360	384,201	1,147,277	1,766,739	8,272,462	10,327,378
	LDT2 - DSL	5,856	11,500	28,472	53,341	219,880	314,915
	LDT2 - GAS	796,361	1,161,352	3,719,666	5,376,163	26,828,207	31,320,035
	MCY - GAS	113,827	164,486	227,654	328,973	862,643	986,000
	MDV - DSL	13,132	25,821	63,466	119,068	488,055	694,398
	MDV - GAS	506,666	747,975	2,341,679	3,443,306	16,629,944	19,780,157
Trucks	LHD1 - DSL	44,178	70,550	555,700	887,435	1,619,343	2,041,976
	LHD1 - GAS	56,884	69,062	847,484	1,028,915	1,938,952	2,021,451
	LHD2 - DSL	16,213	29,009	203,943	364,899	597,880	804,669
	LHD2 - GAS	7,972	10,756	118,774	160,246	273,199	307,915
	PTO - DSL	-	-	-	-	52,885	58,601
	T6 AG - DSL	80	12	354	52	733	3
	T6 CAIRP HEAVY - DSL	157	255	2,290	3,717	30,550	41,122
	T6 CAIRP SMALL - DSL	84	144	1,229	2,105	4,400	5,998
	T6 INSTATE CONSTRUCTION HEAVY - DSL	1,057	1,537	4,778	6,949	69,592	104,149
	T6 INSTATE CONSTRUCTION SMALL - DSL	2,963	5,116	13,394	23,127	166,183	250,584
	T6 INSTATE HEAVY - DSL	5,949	12,072	68,656	139,311	812,811	1,186,454
	T6 INSTATE SMALL - DSL	22,394	34,699	258,424	400,417	1,163,035	1,533,299
	T6 OOS HEAVY - DSL	91	149	1,333	2,169	17,829	24,163
	T6 OOS SMALL - DSL	48	83	700	1,205	2,487	3,374
	T6 PUBLIC - DSL	4,147	5,738	12,579	17,404	65,930	89,054
	T6 UTILITY - DSL	568	679	6,529	7,804	9,516	11,304
	T6TS - GAS	5,444	9,101	108,929	182,091	295,343	406,898
	T7 AG - DSL	60	31	263	138	589	4
	T7 CAIRP - DSL	3,729	4,355	54,448	63,579	678,630	897,446
	T7 CAIRP CONSTRUCTION - DSL	274	433	1,239	1,958	49,988	74,811
	T7 NNOOS - DSL	4,187	6,804	61,136	99,342	827,449	1,094,379
	T7 NOOS - DSL	1,478	1,731	21,575	25,271	266,599	352,548
	T7 OTHER PORT - DSL	374	578	2,839	4,395	64,575	97,977
	T7 POAK - DSL	2,976	5,336	22,615	40,556	360,711	906,992
	T7 POLA - DSL	0	0	0	0	0	0
	T7 PUBLIC - DSL	2,687	2,547	8,152	7,725	54,483	51,604
	T7 SINGLE - DSL	4,095	3,678	47,255	42,445	266,338	295,128
	T7 SINGLE CONSTRUCTION - DSL	1,787	2,434	8,079	11,006	124,012	185,592
	T7 SWCV - DSL	2,150	1,757	8,384	6,851	87,720	71,636
	T7 TRACTOR - DSL	7,991	12,419	101,484	157,723	1,103,485	1,538,163
	T7 TRACTOR CONSTRUCTION - DSL	1,502	2,079	6,789	9,397	102,299	153,097
	T7 UTILITY - DSL	237	276	2,724	3,178	4,807	5,602
	T7IS - GAS	24	36	488	711	2,904	3,781
Buses	ALL OTHER BUSES - DSL	1,938	2,945	16,277	24,736	118,309	150,458
	MOTOR COACH - DSL	353	545	5,150	7,950	49,710	67,500
	OBUS - GAS	1,930	2,008	38,619	40,184	95,272	83,477
	SBUS - DSL	2,803	3,790	32,346	43,739	89,355	119,809
	SBUS - GAS	629	1,637	2,518	6,546	30,182	66,494
	UBUS - DSL	2,246	2,249	8,983	8,994	227,047	226,383
	UBUS - GAS	162	154	649	617	11,994	11,094
Other Vehicle Types	MH - DSL	3,565	5,660	357	566	33,643	42,422
	MH - GAS	9,272	11,408	928	1,141	86,496	95,990
Total		**4,258,362**	**6,296,652**	**21,245,892**	**31,184,212**	**148,885,746**	**181,221,775**

EMFAC2021 Assumptions by County and Veh Tech

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
Alameda	All Other Buses-Dsl	235	305	2,095	2,714	13,545	15,787	-	-	13,545	15,787	0.002	0.000	0.033	0.013	0.035	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	17.4	17.5
	All Other Buses-NG	1	6	13	51	95	314	-	-	95	314	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.3
	LDA-Dsl	1,997	304	8,403	1,365	55,976	10,364	-	-	55,976	10,364	0.002	0.000	0.016	0.000	0.017	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	14.9	2.1
	LDA-Elec	34,126	67,770	168,612	315,998	-	-	1,478,652	2,638,224	1,478,652	2,638,224	-	-	-	-	-	-	-	-	0.002	0.004	0.003	0.006	0.006	0.010	-	-	0.007	0.013	0.013	0.023	0.020	0.036	-	-
	LDA-Gas	464,190	482,087	2,143,706	2,239,833	16,788,183	17,773,015	-	-	16,788,183	17,773,015	2.863	1.299	1.351	0.682	1.731	0.870	0.028	0.011	0.044	0.052	0.037	0.039	0.109	0.103	0.030	0.012	0.126	0.149	0.148	0.157	0.304	0.318	5,341.8	4,531.7
	LDA-Phe	11,325	22,809	46,828	94,315	260,466	346,338	251,566	504,071	512,033	850,410	0.021	0.054	0.007	0.013	0.009	0.016	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.001	0.000	0.002	0.004	0.005	0.007	0.007	0.012	80.1	117.1
	LDT1-Dsl	27	0	78	2	329	13	-	-	329	13	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.0
	LDT1-Elec	104	987	489	4,598	-	-	3,900	38,330	3,900	38,330	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	LDT1-Gas	44,544	30,993	197,424	141,057	1,488,717	1,112,397	-	-	1,488,717	1,112,397	0.508	0.106	0.266	0.045	0.344	0.058	0.004	0.001	0.005	0.004	0.003	0.002	0.012	0.007	0.004	0.001	0.014	0.012	0.013	0.010	0.031	0.022	559.5	327.2
	LDT1-Phe	31	749	127	3,095	739	11,502	864	16,774	1,603	28,276	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	3.9
	LDT2-Dsl	711	999	3,378	4,615	28,599	37,138	-	-	28,599	37,138	0.000	0.001	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	10.1	10.2
	LDT2-Elec	763	10,625	3,908	49,741	-	-	27,516	289,167	27,516	289,167	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-	0.000	0.001	0.000	0.003	0.000	0.004	-	-
	LDT2-Gas	206,421	260,636	964,203	1,203,145	7,950,446	9,679,725	-	-	7,950,446	9,679,725	1.252	0.820	0.891	0.438	1.145	0.558	0.013	0.006	0.025	0.036	0.018	0.021	0.056	0.063	0.014	0.007	0.070	0.101	0.070	0.085	0.155	0.194	3,125.0	2,964.9
	LDT2-Phe	1,201	7,208	4,965	29,803	28,942	110,145	31,272	160,380	60,213	270,524	0.002	0.017	0.001	0.004	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.002	0.001	0.004	8.9	37.6
	LHD1-Dsl	7,479	6,582	94,071	82,787	295,606	234,534	-	-	295,606	234,534	0.062	0.022	0.586	0.055	0.617	0.058	0.013	0.004	0.009	0.007	0.001	0.001	0.023	0.012	0.013	0.005	0.025	0.020	0.004	0.003	0.043	0.028	207.1	154.6
	LHD1-Elec		14,282		200,037		-		595,957		595,957		-		-		-		-		0.009		0.001		0.010		-		0.026		0.005		0.031		-
	LHD1-Gas	15,860	10,223	236,284	152,310	594,683	367,895	-	-	594,683	367,895	0.231	0.079	0.276	0.066	0.324	0.076	0.001	0.000	0.018	0.011	0.001	0.001	0.020	0.012	0.001	0.001	0.051	0.032	0.005	0.003	0.058	0.035	585.8	302.2
	LHD2-Dsl	3,149	3,236	39,610	40,710	127,961	109,910	-	-	127,961	109,910	0.024	0.013	0.194	0.035	0.204	0.036	0.005	0.003	0.004	0.004	0.000	0.000	0.010	0.007	0.005	0.003	0.013	0.011	0.002	0.001	0.020	0.015	107.5	84.7
	LHD2-Elec		3,574		47,288		-		144,452		144,452		-		-		-		-		0.003		0.000		0.003		-		0.007		0.001		0.009		-
	LHD2-Gas	2,255	1,212	33,590	18,062	82,207	42,352	-	-	82,207	42,352	0.029	0.010	0.038	0.007	0.044	0.008	0.000	0.000	0.003	0.001	0.000	0.000	0.003	0.002	0.000	0.000	0.008	0.004	0.001	0.000	0.009	0.005	91.2	39.2
	MCY-Gas	21,934	25,001	43,868	50,001	126,959	142,305	-	-	126,959	142,305	0.744	0.707	0.083	0.068	0.101	0.081	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.002	0.001	0.001	0.003	0.003	24.6	27.8
	MDV-Dsl	1,555	1,649	7,337	7,534	60,904	58,866	-	-	60,904	58,866	0.001	0.000	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.001	28.1	21.0
	MDV-Elec	794	9,797	4,076	45,614	-	-	28,822	262,623	28,822	262,623	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-	0.000	0.001	0.000	0.002	0.000	0.004	-	-
	MDV-Gas	110,712	150,627	510,452	691,886	4,064,872	5,444,540	-	-	4,064,872	5,444,540	0.883	0.503	0.669	0.260	0.861	0.331	0.007	0.004	0.013	0.020	0.009	0.012	0.029	0.036	0.008	0.004	0.037	0.058	0.036	0.048	0.080	0.110	1,937.0	2,022.2
	MDV-Phe	681	4,607	2,817	19,049	16,104	68,320	16,462	99,487	32,565	167,807	0.001	0.011	0.000	0.003	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.002	5.0	23.7
	MH-Dsl	573	864	57	86	5,786	8,537	-	-	5,786	8,537	0.001	0.001	0.026	0.022	0.027	0.023	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	6.8	10.2
	MH-Gas	1,611	1,396	161	140	14,615	15,492	-	-	14,615	15,492	0.016	0.003	0.007	0.003	0.009	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	31.0	32.9
	Motor Coach-Dsl	62	80	1,426	1,831	8,842	10,035	0	0	8,842	10,035	0.000	0.000	0.023	0.013	0.024	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	17.9	17.4
	OBUS-Elec		117		2,344		-		7,593		7,593		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	533	170	10,670	3,396	27,201	5,804	-	-	27,201	5,804	0.009	0.002	0.017	0.003	0.020	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	53.4	9.8
	PTO-Dsl					19,961	13,555	-	-	19,961	13,555	0.000	0.000	0.064	0.035	0.067	0.037	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	45.5	25.5
	PTO-Elec					-	-	10	15,102	10	15,102	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	336	158	4,863	2,285	8,039	3,414	-	-	8,039	3,414	0.000	0.000	0.029	0.003	0.031	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	11.0	4.1
	SBUS-Elec		82		3,134		-		9,011	-	9,011	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	67	79	267	317	3,547	4,172	-	-	3,547	4,172	0.002	0.002	0.003	0.000	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.3	3.4
	SBUS-NG	21	10	302	144	531	213	-	-	531	213	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.3
	T6 CAIRP Class 4-Dsl	4	2	94	52	272	159	-	-	272	159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 CAIRP Class 4-Elec	0	3	0	76	-	-	0	242	0	242	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	5	3	126	63	373	219	-	-	373	219	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.2
	T6 CAIRP Class 5-Elec	0	4	0	93	-	-	0	332	0	332	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	17	13	398	289	974	570	-	-	974	570	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.6
	T6 CAIRP Class 6-Elec	0	19	1	426	-	-	1	869	1	869	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	30	35	688	796	6,112	6,827	-	-	6,112	6,827	0.000	0.000	0.003	0.002	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.1	6.7
	T6 CAIRP Class 7-Elec	0	11	1	248	-	-	3	2,201	3	2,201	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	870	570	12,409	8,127	29,558	18,867	-	-	29,558	18,867	0.002	0.000	0.074	0.019	0.077	0.020	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.002	0.001	0.000	0.000	0.003	0.001	40.3	22.5
	T6 Instate Delivery Class 4-Elec	1	713	8	10,171	-	-	10	24,656	10	24,656	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 4-NG	2	8	34	113	90	264	-	-	90	264	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.3
	T6 Instate Delivery Class 5-Dsl	636	426	9,080	6,085	22,164	14,129	-	-	22,164	14,129	0.001	0.000	0.044	0.014	0.046	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	30.1	16.8
	T6 Instate Delivery Class 5-Elec	0	534	5	7,623	-	-	6	18,478	6	18,478	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 5-NG	1	6	19	84	49	196	-	-	49	196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Delivery Class 6-Dsl	2,268	1,523	32,358	21,740	79,186	50,470	-	-	79,186	50,470	0.003	0.001	0.154	0.051	0.161	0.054	0.001	0.000	0.001	0.001	0.000	0.000	0.003	0.001	0.001	0.000	0.004	0.003	0.001	0.001	0.006	0.003	107.8	60.1
	T6 Instate Delivery Class 6-Elec	2	1,909	22	27,246	-	-	28	65,985	28	65,985	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T6 Instate Delivery Class 6-NG	4	21	54	299	139	698	-	-	139	698	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.8
	T6 Instate Delivery Class 7-Dsl	507	480	7,229	6,852	28,193	24,341	-	-	28,193	24,341	0.000	0.000	0.040	0.025	0.042	0.027	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	37.9	29.2
	T6 Instate Delivery Class 7-Elec	0	337	4	4,808	-	-	7	17,854	7	17,854	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 7-NG	13	10	185	146	729	515	-	-	729	515	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	0.6
	T6 Instate Other Class 4-Dsl	882	580	10,191	6,703	36,292	22,660	-	-	36,292	22,660	0.003	0.000	0.092	0.018	0.096	0.019	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.000	0.000	0.004	0.001	47.5	26.1
	T6 Instate Other Class 4-Elec	0	723	0	8,361	-	-	0	30,720	0	30,720	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 4-NG	2	8	20	94	81	319	-	-	81	319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.3
	T6 Instate Other Class 5-Dsl	1,884	1,329	21,782	15,365	83,260	51,967	-	-	83,260	51,967	0.002	0.001	0.122	0.042	0.128	0.044	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.004	0.003	0.001	0.001	0.006	0.003	109.4	59.8
	T6 Instate Other Class 5-Elec	1	1,660	11	19,184	-	-	20	70,515	20	70,515	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T6 Instate Other Class 5-NG	4	18	46	213	177	729	-	-	177	729	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.7
	T6 Instate Other Class 6-Dsl	1,939	1,338	22,419	15,471	83,746	52,296	-	-	83,746	52,296	0.003	0.001	0.155	0.042	0.162	0.044	0.002	0.000	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000	0.004	0.003	0.001	0.001	0.007	0.003	109.2	60.2
	T6 Instate Other Class 6-Elec	1	1,669	16	19,299	-	-	29	70,872	29	70,872	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T6 Instate Other Class 6-NG	3	19	40	214	149	733	-	-	149	733	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.8
	T6 Instate Other Class 7-Dsl	1,032	1,042	11,927	12,045	51,074	41,175	-	-	51,074	41,175	0.001	0.001	0.079	0.044	0.083	0.046	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.002	0.001	0.001	0.004	0.003	65.4	47.8
	T6 Instate Other Class 7-Elec	0	709	5	8,195	-	-	14	35,392	14	35,392	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 7-NG	25	22	294	254	1,343	840	-	-	1,343	840	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	0.9
	T6 Instate Tractor Class 6-Dsl	8	6	96	66	417	258	-	-	417	258	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.3
	T6 Instate Tractor Class 6-Elec		7		82		-		355	-	355	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	1	1	4	-	-	1	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	443	590	5,121	6,825	28,399	33,788	-	-	28,399	33,788	0.000	0.000	0.039	0.027	0.040	0.029	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	34.5	35.0
	T6 Instate Tractor Class 7-Elec	0	129	2	1,488	-	-	6	8,522	6	8,522	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	11	12	123	139	712	677	-	-	712	677	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.7
	T6 OOS Class 4-Dsl	2	3	51	70	146	215	-	-	146	215	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 OOS Class 5-Dsl	3	4	68	86	200	295	-	-	200	295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T6 OOS Class 6-Dsl	9	17	215	389	522	771	-	-	522	771	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.8
	T6 OOS Class 7-Dsl	15	21	349	475	3,796	5,604	-	-	3,796	5,604	0.000	0.000	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.4	5.3
	T6 Public Class 4-Dsl	99	50	507	255	3,241	1,729	-	-	3,241	1,729	0.000	0.000	0.030	0.001	0.031	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.8	2.2
	T6 Public Class 4-Elec	0	54	0	277	-	-	0	2,067	0	2,067	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	2	4	9	18	79	123	-	-	79	123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 5-Dsl	207	126	1,064	647	7,720	4,376	-	-	7,720	4,376	0.000	0.000	0.031	0.004	0.032	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	11.1	5.5
	T6 Public Class 5-Elec	0	136	0	695	-	-	1	5,174	1	5,174	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	16	10	80	50	655	336	-	-	655	336	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.4
	T6 Public Class 6-Dsl	154	90	792	462	5,476	3,129	-	-	5,476	3,129	0.000	0.000	0.035	0.003	0.036	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	7.9	3.9
	T6 Public Class 6-Elec	0	97	1	499	-	-	2	3,703	2	3,703	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 Public Class 6-NG	12	7	64	38	523	250	-	-	523	250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.3
	T6 Public Class 7-Dsl	361	240	1,850	1,232	16,219	10,186	-	-	16,219	10,186	0.001	0.000	0.100	0.008	0.104	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	23.2	12.5
	T6 Public Class 7-Elec	0	200	1	1,024	-	-	4	9,327	4	9,327	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	17	18	89	91	944	749	-	-	944	749	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	0.9
	T6 Utility Class 5-Dsl	171	81	2,195	1,034	6,984	3,245	-	-	6,984	3,245	0.000	0.000	0.009	0.002	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.8	3.7
	T6 Utility Class 5-Elec		124		1,594		-		5,083		5,083		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	2	1	31	9	95	28	-	-	95	28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 6-Dsl	33	15	417	195	1,319	613	-	-	1,319	613	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	0.7
	T6 Utility Class 6-Elec		24		301		-		961		961		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	6	2	19	5	-	-	19	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	37	17	472	217	1,825	844	-	-	1,825	844	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	1.0
	T6 Utility Class 7-Elec	0	26	1	335	-	-	2	1,345	2	1,345	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	1	0	10	2	35	7	-	-	35	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		679		13,587		-		42,891		42,891		-		-		-		-		0.000		0.000		0.001		-		0.001		0.001		0.002		-
	T6TS-Gas	1,410	626	28,218	12,522	72,594	31,405	-	-	72,594	31,405	0.034	0.008	0.052	0.008	0.062	0.010	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.004	0.002	0.001	0.000	0.005	0.002	145.9	53.1
	T7 CAIRP Class 8-Dsl	1,693	2,268	38,908	52,126	344,082	470,854	-	-	344,082	470,854	0.026	0.034	0.911	0.882	0.970	0.938	0.012	0.015	0.010	0.015	0.003	0.005	0.025	0.034	0.013	0.016	0.028	0.043	0.014	0.019	0.055	0.077	633.8	707.7
	T7 CAIRP Class 8-Elec	4	633	84	14,538	-	-	381	135,920	381	135,920	-	-	-	-	-	-	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-	0.000	0.006	0.000	0.005	0.000	0.012	-	-
	T7 CAIRP Class 8-NG	4	4	84	95	761	862	-	-	761	862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	1.1
	T7 NNOOS Class 8-Dsl	1,511	2,511	34,722	57,703	405,916	714,464	-	-	405,916	714,464	0.029	0.047	0.990	1.560	1.056	1.665	0.013	0.022	0.012	0.023	0.004	0.007	0.029	0.052	0.014	0.023	0.033	0.064	0.016	0.028	0.063	0.116	740.8	1,021.3
	T7 NOOS Class 8-Dsl	633	1,081	14,540	24,843	147,497	259,613	-	-	147,497	259,613	0.012	0.020	0.398	0.615	0.424	0.657	0.005	0.009	0.004	0.008	0.001	0.003	0.011	0.019	0.006	0.009	0.012	0.023	0.006	0.010	0.023	0.043	272.2	375.4
	T7 Other Port Class 8-Dsl	170	169	2,774	2,763	31,816	40,134	-	-	31,816	40,134	0.001	0.001	0.072	0.063	0.077	0.067	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.003	0.004	0.001	0.002	0.005	0.006	59.6	61.4
	T7 Other Port Class 8-Elec	0	39	1	637	-	-	8	10,108	8	10,108	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 POAK Class 8-Dsl	1,119	1,337	18,310	21,881	112,545	153,629	-	-	112,545	153,629	0.006	0.007	0.310	0.293	0.328	0.309	0.002	0.003	0.004	0.006	0.001	0.002	0.007	0.010	0.003	0.003	0.011	0.016	0.004	0.006	0.018	0.025	214.7	239.2
	T7 POAK Class 8-Elec	1	313	11	5,113	-	-	29	35,498	29	35,498	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T7 POAK Class 8-NG	0	3	8	49	46	347	-	-	46	347	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.5
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	767	529	3,937	2,716	33,874	21,528	-	-	33,874	21,528	0.005	0.001	0.310	0.054	0.323	0.056	0.002	0.000	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000	0.004	0.003	0.001	0.001	0.007	0.004	72.0	38.8
	T7 Public Class 8-Elec	0	405	2	2,077	-	-	13	18,493	13	18,493	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Public Class 8-NG	3	4	16	22	165	172	-	-	165	172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T7 Single Concrete/Transit Mix Class 8-Dsl	129	63	1,216	594	9,112	4,240	-	-	9,112	4,240	0.000	0.000	0.018	0.006	0.019	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	17.2	6.9
	T7 Single Concrete/Transit Mix Class 8-Elec	0	90	2	846	-	-	8	6,291	8	6,291	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	8	4	72	37	555	261	-	-	555	261	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.3
	T7 Single Dump Class 8-Dsl	624	421	5,879	3,967	38,647	21,124	-	-	38,647	21,124	0.002	0.001	0.098	0.040	0.103	0.042	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002	0.002	0.001	0.006	0.003	73.8	35.6
	T7 Single Dump Class 8-Elec	0	390	3	3,674	-	-	12	23,355	12	23,355	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Single Dump Class 8-NG	37	26	346	246	2,391	1,307	-	-	2,391	1,307	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.6	1.8
	T7 Single Other Class 8-Dsl	829	921	7,812	8,675	47,010	38,939	-	-	47,010	38,939	0.002	0.002	0.112	0.078	0.118	0.082	0.001	0.001	0.001	0.001	0.000	0.000	0.003	0.002	0.001	0.001	0.004	0.004	0.002	0.002	0.007	0.006	89.0	65.9
	T7 Single Other Class 8-Elec	1	941	9	8,868	-	-	31	46,410	31	46,410	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.002	0.000	0.004	-	-
	T7 Single Other Class 8-NG	48	57	449	534	2,812	2,397	-	-	2,812	2,397	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.1	3.3
	T7 SWCV Class 8-Dsl	225	19	1,036	89	14,614	1,222	-	-	14,614	1,222	0.001	0.000	0.136	0.005	0.143	0.005	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.004	0.000	65.5	5.1
	T7 SWCV Class 8-Elec	0	269	0	1,237	-	-	3	17,400	3	17,400	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T7 SWCV Class 8-NG	265	290	1,217	1,336	17,124	18,844	-	-	17,124	18,844	0.002	0.000	0.040	0.005	0.043	0.006	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.004	0.004	0.001	0.001	0.005	0.005	30.8	27.7
	T7 Tractor Class 8-Dsl	3,549	6,648	51,571	96,593	281,126	427,623	-	-	281,126	427,623	0.019	0.032	0.872	1.093	0.918	1.148	0.007	0.010	0.009	0.014	0.003	0.004	0.018	0.028	0.007	0.010	0.024	0.041	0.011	0.017	0.043	0.068	514.2	639.6
	T7 Tractor Class 8-Elec	3	1,400	41	20,342	-	-	118	97,436	118	97,436	-	-	-	-	-	-	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-	0.000	0.005	0.000	0.004	0.000	0.009	-	-
	T7 Tractor Class 8-NG	471	572	6,849	8,307	37,901	36,676	-	-	37,901	36,676	0.001	0.001	0.032	0.020	0.033	0.020	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.003	0.002	0.001	0.005	0.005	54.8	50.2
	T7 Utility Class 8-Dsl	121	82	1,545	1,053	5,589	3,411	-	-	5,589	3,411	0.000	0.000	0.017	0.009	0.018	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	10.7	5.8
	T7 Utility Class 8-Elec	0	69	0	887	-	-	1	3,187	1	3,187	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		1		18		-		137		137		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	6	1	125	20	791	111	-	-	791	111	0.001	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	0.2
	UBUS-Dsl	579	28	2,316	114	63,687	1,149	-	-	63,687	1,149	0.006	0.000	0.051	0.000	0.051	0.000	0.001	0.000	0.003	0.000	0.001	0.000	0.004	0.000	0.001	0.000	0.008	0.000	0.002	0.000	0.010	0.000	89.6	0.8
	UBUS-Elec	12	655	47	2,621	-	-	1,043	72,023	1,043	72,023	-	-	-	-	-	-	-	-	0.000	0.002	0.000	0.001	0.000	0.002	-	-	0.000	0.004	0.000	0.002	0.000	0.007	-	-
	UBUS-Gas	213	199	852	796	17,419	16,690	-	-	17,419	16,690	0.001	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	19.3	15.5
	UBUS-NG	76	12	305	46	6,752	464	-	-	6,752	464	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	8.0	0.4
Contra Costa	All Other Buses-Dsl	79	114	706	1,012	4,316	4,989	-	-	4,316	4,989	0.001	0.000	0.010	0.005	0.011	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.7	5.7
	All Other Buses-NG	1	2	7	19	39	91	-	-	39	91	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	LDA-Dsl	1,125	182	4,791	806	33,558	6,271	-	-	33,558	6,271	0.001	0.000	0.008	0.000	0.008	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.8	1.2
	LDA-Elec	13,286	38,784	66,090	181,202	-	-	599,866	1,570,519	599,866	1,570,519	-	-	-	-	-	-	-	-	0.001	0.003	0.001	0.003	0.002	0.006	-	-	0.003	0.008	0.005	0.014	0.008	0.021	-	-
	LDA-Gas	262,370	278,483	1,212,159	1,292,592	9,869,322	10,765,450	-	-	9,869,322	10,765,450	1.668	0.770	0.775	0.402	0.997	0.515	0.016	0.006	0.028	0.033	0.022	0.024	0.065	0.064	0.017	0.007	0.079	0.096	0.087	0.095	0.183	0.198	3,130.3	2,696.6
	LDA-Phe	6,262	13,128	25,893	54,285	147,654	209,357	142,729	304,743	290,383	514,100	0.012	0.031	0.004	0.007	0.005	0.009	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.000	0.000	0.001	0.002	0.003	0.005	0.004	0.007	45.8	70.0
	LDT1-Dsl	14	0	42	1	181	8	-	-	181	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	LDT1-Elec	52	547	245	2,548	-	-	2,012	21,954	2,012	21,954	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	25,986	17,241	114,637	78,366	910,636	661,300	-	-	910,636	661,300	0.322	0.060	0.169	0.026	0.219	0.033	0.002	0.000	0.003	0.003	0.002	0.001	0.007	0.004	0.002	0.000	0.009	0.007	0.008	0.006	0.019	0.014	342.0	190.9
	LDT1-Phe	17	415	70	1,717	419	6,825	489	9,952	908	16,777	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	2.3
	LDT2-Dsl	489	560	2,324	2,576	20,622	22,115	-	-	20,622	22,115	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	7.3	6.0
	LDT2-Elec	419	5,892	2,152	27,567	-	-	15,470	165,606	15,470	165,606	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	LDT2-Gas	119,228	144,868	556,364	667,892	4,822,386	5,747,062	-	-	4,822,386	5,747,062	0.740	0.464	0.533	0.251	0.687	0.322	0.008	0.004	0.016	0.022	0.011	0.013	0.034	0.038	0.009	0.004	0.045	0.063	0.043	0.051	0.096	0.117	1,894.9	1,727.1
	LDT2-Phe	669	3,998	2,765	16,531	16,554	65,300	17,850	95,080	34,404	160,380	0.001	0.009	0.000	0.002	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.002	5.2	22.0
	LHD1-Dsl	6,577	3,823	82,732	48,091	250,352	137,640	-	-	250,352	137,640	0.058	0.013	0.570	0.035	0.599	0.036	0.012	0.003	0.008	0.004	0.001	0.000	0.021	0.007	0.013	0.003	0.022	0.012	0.003	0.002	0.038	0.016	176.4	91.0
	LHD1-Elec		7,919		110,918		-		341,200		341,200		-		-		-		-		0.005		0.001		0.006		-		0.015		0.003		0.018		-
	LHD1-Gas	9,771	5,743	145,568	85,557	367,010	212,107	-	-	367,010	212,107	0.147	0.046	0.174	0.037	0.205	0.043	0.001	0.000	0.011	0.006	0.001	0.000	0.013	0.007	0.001	0.000	0.032	0.018	0.003	0.002	0.036	0.020	364.1	174.4
	LHD2-Dsl	2,511	1,915	31,591	24,083	99,584	65,192	-	-	99,584	65,192	0.020	0.008	0.164	0.023	0.172	0.024	0.004	0.002	0.003	0.002	0.000	0.000	0.008	0.004	0.004	0.002	0.010	0.007	0.001	0.001	0.016	0.009	84.9	50.5
	LHD2-Elec		1,982		26,222		-		82,711		82,711		-		-		-		-		0.001		0.000		0.002		-		0.004		0.001		0.005		-
	LHD2-Gas	1,130	665	16,840	9,906	41,813	24,129	-	-	41,813	24,129	0.015	0.005	0.019	0.004	0.023	0.004	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.004	0.002	0.000	0.000	0.005	0.003	46.5	22.3
	MCY-Gas	13,967	14,185	27,934	28,370	80,008	81,900	-	-	80,008	81,900	0.496	0.409	0.054	0.039	0.066	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	15.4	15.7
	MDV-Dsl	1,259	942	5,939	4,262	50,648	35,143	-	-	50,648	35,143	0.001	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	23.5	12.4
	MDV-Elec	441	5,435	2,265	25,290	-	-	16,314	150,445	16,314	150,445	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	MDV-Gas	78,394	84,488	359,316	386,490	2,947,217	3,219,486	-	-	2,947,217	3,219,486	0.656	0.295	0.532	0.150	0.688	0.192	0.005	0.002	0.010	0.012	0.006	0.007	0.022	0.022	0.006	0.002	0.028	0.036	0.026	0.028	0.060	0.066	1,421.6	1,176.0
	MDV-Phe	437	2,560	1,806	10,586	10,454	40,087	10,435	58,322	20,889	98,409	0.001	0.006	0.000	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	3.3	13.7
	MH-Dsl	600	521	60	52	5,780	5,112	-	-	5,780	5,112	0.001	0.000	0.028	0.013	0.029	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.8	6.1
	MH-Gas	1,426	798	143	80	13,032	8,997	-	-	13,032	8,997	0.013	0.002	0.005	0.002	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	27.7	19.1
	Motor Coach-Dsl	19	25	444	578	2,751	3,168	-	-	2,751	3,168	0.000	0.000	0.007	0.004	0.007	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.6	5.5
	OBUS-Elec		65		1,299		-		4,354		4,354		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	202	76	4,046	1,528	9,409	3,141	-	-	9,409	3,141	0.004	0.001	0.008	0.001	0.010	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	18.6	5.2
	PTO-Dsl					10,832	6,884	-	-	10,832	6,884	0.000	0.000	0.035	0.018	0.037	0.019	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	24.7	13.0
	PTO-Elec					-	-	4	7,595	4	7,595	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	328	153	4,748	2,210	7,750	3,294	-	-	7,750	3,294	0.000	0.000	0.036	0.003	0.037	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.5	4.0
	SBUS-Elec		45		2,905		-		7,036	-	7,036	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	SBUS-Gas	56	47	224	188	3,044	2,559	-	-	3,044	2,559	0.001	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.8	2.1
	SBUS-NG	15	9	214	125	369	189	-	-	369	189	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.2
	T6 CAIRP Class 4-Dsl	1	1	28	15	82	45	-	-	82	45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 4-Elec	0	1	0	22	-	-	0	69	0	69	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	2	1	38	18	112	62	-	-	112	62	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 5-Elec	0	1	0	27	-	-	0	94	0	94	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	5	4	120	83	293	162	-	-	293	162	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T6 CAIRP Class 6-Elec	0	5	0	122	-	-	0	246	0	246	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	9	10	207	229	1,842	1,940	-	-	1,842	1,940	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	1.9
	T6 CAIRP Class 7-Elec	0	3	0	71	-	-	1	623	1	623	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	210	130	2,997	1,849	7,065	4,279	-	-	7,065	4,279	0.001	0.000	0.021	0.004	0.022	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	9.6	5.1
	T6 Instate Delivery Class 4-Elec	0	160	2	2,282	-	-	2	5,522	2	5,522	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	1	2	9	26	23	60	-	-	23	60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 5-Dsl	167	105	2,377	1,499	5,747	3,470	-	-	5,747	3,470	0.000	0.000	0.011	0.004	0.012	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.8	4.1
	T6 Instate Delivery Class 5-Elec	0	130	1	1,857	-	-	1	4,496	1	4,496	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	0	1	6	21	15	48	-	-	15	48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 6-Dsl	368	229	5,246	3,265	12,485	7,555	-	-	12,485	7,555	0.001	0.000	0.031	0.008	0.032	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	17.0	9.0
	T6 Instate Delivery Class 6-Elec	0	283	3	4,038	-	-	4	9,767	4	9,767	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	1	3	17	46	44	106	-	-	44	106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Instate Delivery Class 7-Dsl	37	32	530	453	2,011	1,609	-	-	2,011	1,609	0.000	0.000	0.005	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.6	1.9
	T6 Instate Delivery Class 7-Elec		23		328		-		1,212	-	1,212	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Delivery Class 7-NG	1	1	11	9	41	32	-	-	41	32	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 4-Dsl	495	304	5,724	3,515	19,952	11,808	-	-	19,952	11,808	0.002	0.000	0.058	0.010	0.060	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	26.1	13.6
	T6 Instate Other Class 4-Elec	0	374	2	4,324	-	-	4	15,855	4	15,855	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 4-NG	1	4	14	49	58	167	-	-	58	167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Other Class 5-Dsl	1,069	712	12,356	8,236	46,841	27,687	-	-	46,841	27,687	0.001	0.000	0.075	0.022	0.078	0.023	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002	61.1	31.9
	T6 Instate Other Class 5-Elec	0	878	5	10,151	-	-	10	37,230	10	37,230	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 5-NG	3	10	31	114	116	388	-	-	116	388	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	T6 Instate Other Class 6-Dsl	836	541	9,667	6,250	35,490	20,994	-	-	35,490	20,994	0.002	0.000	0.076	0.017	0.079	0.018	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.000	0.000	0.003	0.001	46.1	24.2
	T6 Instate Other Class 6-Elec	1	666	7	7,698	-	-	12	28,186	12	28,186	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 6-NG	2	7	21	87	78	294	-	-	78	294	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.3
	T6 Instate Other Class 7-Dsl	461	425	5,326	4,909	21,795	16,626	-	-	21,795	16,626	0.000	0.000	0.039	0.018	0.041	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	27.9	19.3
	T6 Instate Other Class 7-Elec	0	284	1	3,286	-	-	2	14,114	2	14,114	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 7-NG	11	9	122	103	555	339	-	-	555	339	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.4
	T6 Instate Tractor Class 6-Dsl	8	5	90	58	385	226	-	-	385	226	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.3
	T6 Instate Tractor Class 6-Elec		6		71		-		308	-	308	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	1	1	3	-	-	1	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	53	66	608	759	3,175	3,572	-	-	3,175	3,572	0.000	0.000	0.005	0.003	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.9	3.7
	T6 Instate Tractor Class 7-Elec	0	14	0	163	-	-	0	877	0	877	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	1	1	13	15	75	72	-	-	75	72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 4-Dsl	1	1	16	21	46	64	-	-	46	64	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 5-Dsl	1	1	22	26	63	88	-	-	63	88	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 6-Dsl	3	5	68	117	165	230	-	-	165	230	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 OOS Class 7-Dsl	5	6	111	143	1,201	1,670	-	-	1,201	1,670	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	1.6
	T6 Public Class 4-Dsl	63	33	325	167	2,130	1,129	-	-	2,130	1,129	0.000	0.000	0.016	0.001	0.017	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.1	1.4
	T6 Public Class 4-Elec	0	35	0	179	-	-	0	1,332	0	1,332	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	1	2	6	12	48	79	-	-	48	79	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 5-Dsl	102	61	522	312	3,796	2,105	-	-	3,796	2,105	0.000	0.000	0.015	0.002	0.015	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.5	2.7
	T6 Public Class 5-Elec	0	65	0	331	-	-	0	2,461	0	2,461	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	6	5	31	23	251	156	-	-	251	156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 Public Class 6-Dsl	100	55	511	281	3,500	1,893	-	-	3,500	1,893	0.000	0.000	0.023	0.002	0.024	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.1	2.4
	T6 Public Class 6-Elec	0	58	0	297	-	-	1	2,201	1	2,201	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	3	4	15	20	122	134	-	-	122	134	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Public Class 7-Dsl	149	95	766	487	6,555	4,015	-	-	6,555	4,015	0.001	0.000	0.046	0.003	0.047	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	9.5	4.9
	T6 Public Class 7-Elec	0	79	0	403	-	-	2	3,655	2	3,655	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	5	7	24	35	265	288	-	-	265	288	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T6 Utility Class 5-Dsl	47	22	606	282	1,927	885	-	-	1,927	885	0.000	0.000	0.002	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.4	1.0
	T6 Utility Class 5-Elec		34		435		-		1,386		1,386		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	1	0	9	2	26	8	-	-	26	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	9	4	115	53	364	167	-	-	364	167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.2
	T6 Utility Class 6-Elec		6		82		-		262		262		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	2	0	5	1	-	-	5	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	10	5	130	59	504	230	-	-	504	230	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.3
	T6 Utility Class 7-Elec	0	7	0	91	-	-	0	367	0	367	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	3	1	10	2	-	-	10	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		376		7,531		-		24,610		24,610		-		-		-		-		0.000		0.000		0.000		-		0.001		0.000		0.001		-
	T6TS-Gas	579	338	11,589	6,767	29,313	17,953	-	-	29,313	17,953	0.017	0.004	0.025	0.005	0.030	0.005	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	58.3	30.3
	T7 CAIRP Class 8-Dsl	467	576	10,734	13,229	95,073	116,754	-	-	95,073	116,754	0.007	0.008	0.252	0.222	0.268	0.236	0.003	0.004	0.003	0.004	0.001	0.001	0.007	0.009	0.004	0.004	0.008	0.011	0.004	0.005	0.015	0.019	175.0	175.7
	T7 CAIRP Class 8-Elec	1	159	23	3,646	-	-	106	33,323	106	33,323	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T7 CAIRP Class 8-NG	1	1	23	24	211	214	-	-	211	214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T7 NNOOS Class 8-Dsl	421	637	9,668	14,639	113,258	178,442	-	-	113,258	178,442	0.008	0.012	0.276	0.393	0.294	0.419	0.004	0.006	0.003	0.006	0.001	0.002	0.008	0.013	0.004	0.006	0.009	0.016	0.004	0.007	0.018	0.029	206.6	255.4
	T7 NOOS Class 8-Dsl	176	275	4,047	6,318	41,154	64,840	-	-	41,154	64,840	0.003	0.005	0.111	0.155	0.118	0.166	0.001	0.002	0.001	0.002	0.000	0.001	0.003	0.005	0.002	0.002	0.003	0.006	0.002	0.003	0.007	0.011	75.9	93.9
	T7 Other Port Class 8-Dsl	47	47	768	776	8,812	11,279	-	-	8,812	11,279	0.000	0.000	0.020	0.018	0.021	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	16.5	17.3
	T7 Other Port Class 8-Elec	0	11	0	179	-	-	2	2,841	2	2,841	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	308	371	5,033	6,077	30,945	42,861	-	-	30,945	42,861	0.002	0.002	0.085	0.082	0.090	0.086	0.001	0.001	0.001	0.002	0.000	0.000	0.002	0.003	0.001	0.001	0.003	0.004	0.001	0.002	0.005	0.007	59.0	66.7
	T7 POAK Class 8-Elec	0	87	3	1,420	-	-	8	9,903	8	9,903	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 POAK Class 8-NG	0	1	2	14	12	97	-	-	12	97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	354	235	1,818	1,208	15,197	9,542	-	-	15,197	9,542	0.003	0.001	0.165	0.025	0.172	0.026	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.001	0.000	0.003	0.002	32.8	17.2
	T7 Public Class 8-Elec	0	180	1	925	-	-	4	8,198	4	8,198	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 Public Class 8-NG	1	2	7	10	73	77	-	-	73	77	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 Single Concrete/Transit Mix Class 8-Dsl	60	29	564	277	4,208	1,978	-	-	4,208	1,978	0.000	0.000	0.008	0.003	0.009	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.0	3.2
	T7 Single Concrete/Transit Mix Class 8-Elec	0	42	1	394	-	-	4	2,939	4	2,939	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	3	2	31	17	240	122	-	-	240	122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T7 Single Dump Class 8-Dsl	391	260	3,679	2,447	23,581	13,039	-	-	23,581	13,039	0.001	0.001	0.062	0.025	0.065	0.026	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.001	0.004	0.002	45.3	22.0
	T7 Single Dump Class 8-Elec		241		2,272		-		14,447	-	14,447	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.001		0.001	-	0.001	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T7 Single Dump Class 8-NG	22	16	207	151	1,416	805	-	-	1,416	805	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	1.1
	T7 Single Other Class 8-Dsl	441	505	4,154	4,761	23,765	17,641	-	-	23,765	17,641	0.001	0.001	0.057	0.039	0.060	0.041	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.003	0.003	45.0	30.2
	T7 Single Other Class 8-Elec	1	513	6	4,828	-	-	18	20,865	18	20,865	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Single Other Class 8-NG	24	31	224	292	1,345	1,083	-	-	1,345	1,083	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	1.6
	T7 SWCV Class 8-Dsl	140	12	642	55	9,057	770	-	-	9,057	770	0.000	0.000	0.082	0.004	0.085	0.004	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.003	0.000	40.8	3.3
	T7 SWCV Class 8-Elec	0	160	0	736	-	-	1	10,363	1	10,363	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.000	0.000	0.002	-	-
	T7 SWCV Class 8-NG	158	175	725	804	10,206	11,339	-	-	10,206	11,339	0.001	0.000	0.022	0.003	0.023	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.003	0.003	18.3	16.7
	T7 Tractor Class 8-Dsl	978	1,714	14,216	24,897	77,667	106,112	-	-	77,667	106,112	0.005	0.008	0.241	0.278	0.253	0.292	0.002	0.002	0.002	0.004	0.001	0.001	0.005	0.007	0.002	0.003	0.007	0.010	0.003	0.004	0.012	0.017	142.0	159.2
	T7 Tractor Class 8-Elec	1	354	11	5,149	-	-	33	23,757	33	23,757	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Tractor Class 8-NG	130	147	1,896	2,143	10,509	9,107	-	-	10,509	9,107	0.000	0.000	0.009	0.005	0.009	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	15.2	12.6
	T7 Utility Class 8-Dsl	33	23	427	289	1,542	934	-	-	1,542	934	0.000	0.000	0.005	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.0	1.6
	T7 Utility Class 8-Elec	0	19	0	241	-	-	0	865	0	865	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		1		10		-		79		79		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	1	0	14	10	39	63	-	-	39	63	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	UBUS-Dsl	174	0	695	0	17,872	0	-	-	17,872	0	0.002	0.000	0.027	0.000	0.027	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.003	0.000	26.8	0.0
	UBUS-Elec	9	228	37	910	-	-	259	21,466	259	21,466	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	UBUS-Gas	79	49	315	195	4,302	2,201	-	-	4,302	2,201	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.5	2.0
	UBUS-NG	6	0	24	0	524	0	-	-	524	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.0
Marin	All Other Buses-Dsl	20	27	180	242	1,085	1,167	-	-	1,085	1,167	0.000	0.000	0.003	0.001	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	1.3
	All Other Buses-NG	0	0	1	4	6	18	-	-	6	18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDA-Dsl	588	55	2,534	237	16,650	1,479	-	-	16,650	1,479	0.001	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.5	0.3
	LDA-Elec	5,191	10,291	25,662	48,132	-	-	229,296	385,476	229,296	385,476	-	-	-	-	-	-	-	-	0.000	0.001	0.001	0.001	0.001	0.002	-	-	0.001	0.002	0.002	0.003	0.003	0.005	-	-
	LDA-Gas	69,075	73,415	319,124	341,759	2,361,848	2,394,956	-	-	2,361,848	2,394,956	0.445	0.195	0.208	0.097	0.264	0.123	0.004	0.001	0.006	0.007	0.005	0.005	0.015	0.014	0.004	0.002	0.016	0.020	0.021	0.021	0.042	0.043	754.8	598.2
	LDA-Phe	1,742	3,465	7,202	14,328	37,263	47,168	36,341	68,620	73,605	115,788	0.003	0.008	0.001	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	11.2	15.5
	LDT1-Dsl	5	0	15	0	47	2	-	-	47	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDT1-Elec	27	172	126	800	-	-	993	6,286	993	6,286	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	8,217	5,494	36,011	24,795	250,805	169,950	-	-	250,805	169,950	0.103	0.020	0.051	0.008	0.065	0.010	0.001	0.000	0.001	0.001	0.001	0.000	0.002	0.001	0.001	0.000	0.002	0.002	0.002	0.001	0.005	0.003	95.4	49.0
	LDT1-Phe	5	131	22	540	117	1,754	136	2,558	253	4,312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.6
	LDT2-Dsl	279	184	1,317	830	10,161	5,710	-	-	10,161	5,710	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.7	1.5
	LDT2-Elec	140	1,840	714	8,578	-	-	5,085	47,132	5,085	47,132	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	LDT2-Gas	38,717	45,688	181,208	209,377	1,403,266	1,466,159	-	-	1,403,266	1,466,159	0.226	0.151	0.154	0.073	0.195	0.091	0.002	0.001	0.004	0.005	0.003	0.003	0.010	0.009	0.003	0.001	0.012	0.015	0.012	0.013	0.027	0.029	555.1	440.4
	LDT2-Phe	218	1,251	900	5,172	4,786	16,689	5,122	24,293	9,908	40,982	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	1.4	5.5
	LHD1-Dsl	1,677	1,210	21,100	15,215	63,912	39,739	-	-	63,912	39,739	0.015	0.004	0.148	0.010	0.155	0.011	0.003	0.001	0.002	0.001	0.000	0.000	0.005	0.002	0.003	0.001	0.005	0.003	0.001	0.001	0.010	0.005	44.8	26.3
	LHD1-Elec		2,469		34,574		-		96,984		96,984		-		-		-		-		0.001		0.000		0.002		-		0.004		0.001		0.005		-
	LHD1-Gas	2,698	1,810	40,193	26,964	101,446	60,871	-	-	101,446	60,871	0.043	0.015	0.050	0.012	0.058	0.013	0.000	0.000	0.003	0.002	0.000	0.000	0.003	0.002	0.000	0.000	0.009	0.005	0.001	0.001	0.010	0.006	100.3	50.1
	LHD2-Dsl	597	598	7,514	7,525	24,366	18,727	-	-	24,366	18,727	0.005	0.002	0.037	0.006	0.039	0.007	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.002	0.000	0.000	0.004	0.003	20.6	14.5
	LHD2-Elec		622		8,223		-		23,638		23,638		-		-		-		-		0.000		0.000		0.000		-		0.001		0.000		0.001		-
	LHD2-Gas	340	214	5,062	3,191	12,489	7,031	-	-	12,489	7,031	0.005	0.002	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	13.9	6.5
	MCY-Gas	4,169	4,517	8,337	9,034	23,716	23,312	-	-	23,716	23,312	0.143	0.125	0.016	0.011	0.020	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	4.6	4.5
	MDV-Dsl	557	310	2,619	1,379	19,845	9,102	-	-	19,845	9,102	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.5	3.2
	MDV-Elec	138	1,701	708	7,886	-	-	5,090	42,888	5,090	42,888	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	MDV-Gas	19,360	26,378	89,623	120,384	671,953	820,863	-	-	671,953	820,863	0.146	0.092	0.110	0.043	0.140	0.054	0.001	0.001	0.002	0.003	0.001	0.002	0.005	0.005	0.001	0.001	0.006	0.009	0.006	0.007	0.013	0.016	322.7	299.4
	MDV-Phe	123	801	507	3,312	2,613	10,307	2,647	15,000	5,259	25,307	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	3.5
	MH-Dsl	163	172	16	17	1,678	1,513	-	-	1,678	1,513	0.000	0.000	0.007	0.004	0.007	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	1.8
	MH-Gas	296	249	30	25	2,757	2,560	-	-	2,757	2,560	0.003	0.001	0.001	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.9	5.4
	Motor Coach-Dsl	7	10	154	229	954	1,256	-	-	954	1,256	0.000	0.000	0.002	0.002	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	2.2
	OBUS-Elec		20		405		-		1,206		1,206		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	84	31	1,680	620	4,357	949	-	-	4,357	949	0.001	0.000	0.002	0.000	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.6	1.6
	PTO-Dsl					1,369	969	-	-	1,369	969	0.000	0.000	0.004	0.003	0.005	0.003	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	3.1	1.8
	PTO-Elec					-	-	1	1,055	1	1,055	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	68	37	985	541	1,509	777	-	-	1,509	777	0.000	0.000	0.011	0.001	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	0.9
	SBUS-Elec		15		638		-		1,650	-	1,650	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	27	15	108	60	1,429	735	-	-	1,429	735	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.3	0.6
	SBUS-NG	2	2	31	32	53	46	-	-	53	46	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 4-Dsl	0	0	3	2	8	5	-	-	8	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 4-Elec	0	0	0	2	-	-	0	7	0	7	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	0	0	4	2	11	7	-	-	11	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 5-Elec	0	0	0	3	-	-	0	10	0	10	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	1	0	12	9	30	18	-	-	30	18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 6-Elec	0	1	0	13	-	-	0	27	0	27	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	1	1	21	25	188	211	-	-	188	211	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 CAIRP Class 7-Elec	0	0	0	8	-	-	0	68	0	68	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	61	41	876	586	2,081	1,352	-	-	2,081	1,352	0.000	0.000	0.006	0.001	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.8	1.6
	T6 Instate Delivery Class 4-Elec	0	50	1	715	-	-	1	1,725	1	1,725	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	0	1	3	8	9	19	-	-	9	19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 5-Dsl	39	27	560	383	1,360	883	-	-	1,360	883	0.000	0.000	0.003	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	1.1
	T6 Instate Delivery Class 5-Elec	0	33	0	467	-	-	1	1,125	1	1,125	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	0	0	2	5	4	12	-	-	4	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 6-Dsl	66	44	935	634	2,255	1,463	-	-	2,255	1,463	0.000	0.000	0.006	0.002	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.1	1.7
	T6 Instate Delivery Class 6-Elec	0	54	0	774	-	-	1	1,868	1	1,868	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	0	1	3	9	8	20	-	-	8	20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 7-Dsl	3	3	48	45	176	153	-	-	176	153	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 Instate Delivery Class 7-Elec		2		31		-		109	-	109	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Delivery Class 7-NG	0	0	1	1	3	3	-	-	3	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 4-Dsl	109	72	1,256	835	4,399	2,787	-	-	4,399	2,787	0.001	0.000	0.013	0.002	0.014	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	5.8	3.2
	T6 Instate Other Class 4-Elec	0	88	0	1,015	-	-	0	3,708	0	3,708	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 4-NG	0	1	3	12	13	39	-	-	13	39	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 5-Dsl	246	178	2,846	2,052	10,852	6,858	-	-	10,852	6,858	0.000	0.000	0.017	0.006	0.017	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	14.2	7.9
	T6 Instate Other Class 5-Elec	0	217	1	2,503	-	-	2	9,145	2	9,145	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 5-NG	0	2	4	28	16	96	-	-	16	96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 6-Dsl	150	106	1,737	1,227	6,476	4,096	-	-	6,476	4,096	0.000	0.000	0.012	0.003	0.013	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.5	4.7
	T6 Instate Other Class 6-Elec	0	129	1	1,494	-	-	1	5,455	1	5,455	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 6-NG	0	1	3	17	11	57	-	-	11	57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 7-Dsl	109	105	1,258	1,209	4,944	4,051	-	-	4,944	4,051	0.000	0.000	0.010	0.005	0.010	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.3	4.7
	T6 Instate Other Class 7-Elec		68		791		-		3,377	-	3,377	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Other Class 7-NG	2	2	29	26	128	84	-	-	128	84	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Instate Tractor Class 6-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 6-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 Instate Tractor Class 6-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	5	7	63	81	317	378	-	-	317	378	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.4
	T6 Instate Tractor Class 7-Elec	0	2	0	17	-	-	0	92	0	92	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	0	0	1	2	6	7	-	-	6	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 4-Dsl	0	0	4	6	11	17	-	-	11	17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 5-Dsl	0	0	5	7	15	23	-	-	15	23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 6-Dsl	1	1	17	31	40	60	-	-	40	60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 7-Dsl	1	2	27	38	294	436	-	-	294	436	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.4
	T6 Public Class 4-Dsl	20	10	101	52	681	349	-	-	681	349	0.000	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.0	0.4
	T6 Public Class 4-Elec	0	10	0	53	-	-	0	393	0	393	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	1	1	3	4	25	25	-	-	25	25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 5-Dsl	39	22	199	111	1,423	737	-	-	1,423	737	0.000	0.000	0.006	0.001	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	0.9
	T6 Public Class 5-Elec	0	22	0	111	-	-	0	823	0	823	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	1	2	7	8	60	52	-	-	60	52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 6-Dsl	32	16	162	82	1,073	546	-	-	1,073	546	0.000	0.000	0.009	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	0.7
	T6 Public Class 6-Elec	0	16	0	83	-	-	0	614	0	614	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	1	1	4	6	29	38	-	-	29	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 7-Dsl	55	35	280	179	2,427	1,456	-	-	2,427	1,456	0.000	0.000	0.015	0.001	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.5	1.8
	T6 Public Class 7-Elec	0	28	0	141	-	-	0	1,276	0	1,276	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	4	3	18	14	189	113	-	-	189	113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Utility Class 5-Dsl	5	2	62	27	198	85	-	-	198	85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Utility Class 5-Elec		3		42		-		132		132		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	1	0	3	1	-	-	3	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	1	0	12	5	37	16	-	-	37	16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Elec		1		8		-		25		25		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	1	0	13	6	52	22	-	-	52	22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 7-Elec	0	1	0	9	-	-	0	35	0	35	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		118		2,366		-		6,955		6,955		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6TS-Gas	252	113	5,037	2,267	12,607	5,199	-	-	12,607	5,199	0.007	0.001	0.010	0.001	0.012	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	25.3	8.8
	T7 CAIRP Class 8-Dsl	49	64	1,132	1,473	9,989	12,845	-	-	9,989	12,845	0.001	0.001	0.026	0.025	0.028	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.002	18.4	19.3
	T7 CAIRP Class 8-Elec	0	18	2	403	-	-	11	3,639	11	3,639	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 CAIRP Class 8-NG	0	0	2	3	22	24	-	-	22	24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 NNOOS Class 8-Dsl	44	71	1,020	1,624	11,899	19,600	-	-	11,899	19,600	0.001	0.001	0.029	0.043	0.031	0.046	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	0.000	0.001	0.002	0.003	21.7	28.1
	T7 NOOS Class 8-Dsl	19	31	427	702	4,324	7,122	-	-	4,324	7,122	0.000	0.001	0.012	0.017	0.012	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	8.0	10.3
	T7 Other Port Class 8-Dsl	5	6	82	94	936	1,371	-	-	936	1,371	0.000	0.000	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	2.1
	T7 Other Port Class 8-Elec	0	1	0	22	-	-	0	345	0	345	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	33	45	535	739	3,287	5,209	-	-	3,287	5,209	0.000	0.000	0.009	0.010	0.010	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	6.3	8.1
	T7 POAK Class 8-Elec	0	11	0	173	-	-	1	1,204	1	1,204	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-NG	0	0	0	2	1	12	-	-	1	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	109	70	559	359	4,639	2,800	-	-	4,639	2,800	0.001	0.000	0.048	0.008	0.050	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	10.0	5.1
	T7 Public Class 8-Elec	0	50	0	255	-	-	1	2,242	1	2,242	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Public Class 8-NG	0	1	2	3	20	22	-	-	20	22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Single Concrete/Transit Mix Class 8-Dsl	3	2	30	17	211	113	-	-	211	113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T7 Single Concrete/Transit Mix Class 8-Elec	0	3	0	24	-	-	0	167	0	167	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	0	0	1	1	10	7	-	-	10	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Single Dump Class 8-Dsl	48	37	453	347	2,928	1,848	-	-	2,928	1,848	0.000	0.000	0.007	0.004	0.008	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.6	3.1
	T7 Single Dump Class 8-Elec		34		322		-		2,045	-	2,045	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T7 Single Dump Class 8-NG	3	2	24	21	166	114	-	-	166	114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T7 Single Other Class 8-Dsl	66	87	618	821	3,392	2,636	-	-	3,392	2,636	0.000	0.000	0.008	0.006	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.4	4.6
	T7 Single Other Class 8-Elec	0	88	1	827	-	-	3	3,099	3	3,099	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Other Class 8-NG	3	5	32	50	185	161	-	-	185	161	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T7 SWCV Class 8-Dsl	34	3	156	14	2,201	200	-	-	2,201	200	0.000	0.000	0.021	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	9.9	0.8
	T7 SWCV Class 8-Elec	0	34	0	157	-	-	0	2,201	0	2,201	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 SWCV Class 8-NG	36	39	167	180	2,345	2,540	-	-	2,345	2,540	0.000	0.000	0.006	0.001	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	4.2	3.8
	T7 Tractor Class 8-Dsl	103	193	1,499	2,800	8,150	11,666	-	-	8,150	11,666	0.001	0.001	0.025	0.031	0.027	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	14.9	17.5
	T7 Tractor Class 8-Elec	0	39	1	572	-	-	3	2,581	3	2,581	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Tractor Class 8-NG	14	17	200	241	1,104	1,002	-	-	1,104	1,002	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	1.4
	T7 Utility Class 8-Dsl	3	2	44	29	158	92	-	-	158	92	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T7 Utility Class 8-Elec	0	2	0	23	-	-	0	80	0	80	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		0		3		-		22		22		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	1	0	15	3	28	18	-	-	28	18	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	UBUS-Dsl	33	0	131	0	4,001	0	-	-	4,001	0	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.5	0.0
	UBUS-Elec	1	59	3	235	-	-	14	7,210	14	7,210	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	UBUS-Gas	35	25	141	100	3,679	2,180	-	-	3,679	2,180	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.7	2.0
	UBUS-NG	2	0	10	0	265	0	-	-	265	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.0
Napa	All Other Buses-Dsl	41	53	361	475	2,401	2,673	-	-	2,401	2,673	0.000	0.000	0.005	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.1	3.0
	All Other Buses-NG	0	1	2	8	15	50	-	-	15	50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDA-Dsl	187	23	767	100	5,583	861	-	-	5,583	861	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	0.2
	LDA-Elec	1,367	4,677	6,806	21,707	-	-	64,377	199,318	64,377	199,318	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.001	0.002	0.001	0.003	-	-
	LDA-Gas	29,218	33,616	134,573	154,987	1,193,508	1,441,302	-	-	1,193,508	1,441,302	0.191	0.098	0.095	0.052	0.124	0.068	0.002	0.001	0.004	0.005	0.003	0.003	0.008	0.009	0.002	0.001	0.011	0.014	0.011	0.013	0.023	0.028	369.9	350.5
	LDA-Phe	677	1,586	2,801	6,558	17,699	27,844	17,197	40,501	34,896	68,345	0.001	0.004	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	5.6	9.2
	LDT1-Dsl	3	0	8	0	29	1	-	-	29	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDT1-Elec	7	60	31	277	-	-	250	2,545	250	2,545	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	3,799	1,921	16,406	8,653	127,072	74,815	-	-	127,072	74,815	0.055	0.007	0.029	0.003	0.039	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.003	0.002	47.4	21.0
	LDT1-Phe	2	45	8	187	44	767	51	1,119	95	1,886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.3
	LDT2-Dsl	82	63	389	286	3,417	2,505	-	-	3,417	2,505	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.7
	LDT2-Elec	45	641	229	2,989	-	-	1,709	19,174	1,709	19,174	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT2-Gas	15,173	15,953	70,376	73,075	605,704	646,343	-	-	605,704	646,343	0.100	0.054	0.074	0.028	0.096	0.037	0.001	0.000	0.002	0.003	0.001	0.001	0.005	0.004	0.001	0.000	0.006	0.008	0.005	0.006	0.013	0.014	235.8	189.1
	LDT2-Phe	74	435	307	1,800	1,801	7,330	1,926	10,669	3,727	17,999	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	2.4
	LHD1-Dsl	1,615	480	20,317	6,039	58,307	17,267	-	-	58,307	17,267	0.016	0.002	0.167	0.005	0.177	0.006	0.003	0.000	0.002	0.001	0.000	0.000	0.005	0.001	0.004	0.000	0.005	0.001	0.001	0.000	0.009	0.002	41.3	11.5
	LHD1-Elec		860		12,047		-		39,443		39,443		-		-		-		-		0.001		0.000		0.001		-		0.002		0.000		0.002		-
	LHD1-Gas	1,777	677	26,472	10,093	63,336	25,633	-	-	63,336	25,633	0.033	0.006	0.037	0.005	0.044	0.006	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.005	0.002	0.001	0.000	0.006	0.002	64.8	21.2
	LHD2-Dsl	597	261	7,515	3,285	22,643	8,624	-	-	22,643	8,624	0.005	0.001	0.049	0.004	0.052	0.005	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.000	0.000	0.004	0.001	19.6	6.8

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	LHD2-Elec		215		2,849		-		9,567		9,567		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.001		-
	LHD2-Gas	216	77	3,220	1,154	7,591	2,911	-	-	7,591	2,911	0.004	0.001	0.005	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	8.8	2.7
	MCY-Gas	1,892	1,631	3,784	3,263	10,517	9,597	-	-	10,517	9,597	0.068	0.047	0.008	0.005	0.009	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	1.8
	MDV-Dsl	250	112	1,172	492	9,996	4,041	-	-	9,996	4,041	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.5	1.4
	MDV-Elec	47	592	243	2,748	-	-	1,819	17,446	1,819	17,446	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	MDV-Gas	11,109	9,398	50,344	42,590	404,575	362,939	-	-	404,575	362,939	0.101	0.035	0.079	0.017	0.104	0.022	0.001	0.000	0.002	0.001	0.001	0.001	0.003	0.003	0.001	0.000	0.004	0.004	0.004	0.003	0.009	0.008	193.8	129.1
	MDV-Phe	54	280	223	1,157	1,309	4,517	1,281	6,571	2,589	11,088	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	1.5
	MH-Dsl	104	65	10	7	1,014	644	-	-	1,014	644	0.000	0.000	0.005	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.8
	MH-Gas	238	91	24	9	2,199	1,067	-	-	2,199	1,067	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.7	2.3
	Motor Coach-Dsl	9	14	215	313	1,331	1,718	-	-	1,331	1,718	0.000	0.000	0.003	0.002	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.7	3.0
	OBUS-Elec		7		140		-		544		544		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	66	17	1,312	335	4,081	502	-	-	4,081	502	0.001	0.000	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.0	0.9
	PTO-Dsl					2,699	1,692	-	-	2,699	1,692	0.000	0.000	0.008	0.004	0.009	0.005	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	6.1	3.2
	PTO-Elec					-	-	1	1,954	1	1,954	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	69	36	1,004	518	1,610	770	-	-	1,610	770	0.000	0.000	0.009	0.001	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	0.9
	SBUS-Elec		5		662		-		1,384	-	1,384	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	6	5	26	20	397	312	-	-	397	312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	SBUS-NG	3	2	47	31	82	47	-	-	82	47	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 4-Dsl	0	0	2	1	7	4	-	-	7	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 4-Elec	0	0	0	2	-	-	0	6	0	6	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	0	0	3	2	9	5	-	-	9	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 5-Elec	0	0	0	2	-	-	0	8	0	8	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	0	0	10	7	24	13	-	-	24	13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 6-Elec	0	0	0	10	-	-	0	20	0	20	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	1	1	17	19	151	158	-	-	151	158	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 CAIRP Class 7-Elec	0	0	0	6	-	-	0	51	0	51	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	21	13	301	186	712	429	-	-	712	429	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.0	0.5
	T6 Instate Delivery Class 4-Elec	0	16	0	227	-	-	0	548	0	548	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	0	0	1	3	2	6	-	-	2	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 5-Dsl	27	18	389	255	926	558	-	-	926	558	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.3	0.7
	T6 Instate Delivery Class 5-Elec	0	22	0	313	-	-	0	713	0	713	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	0	0	1	4	3	8	-	-	3	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 6-Dsl	54	34	775	482	1,847	1,111	-	-	1,847	1,111	0.000	0.000	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5	1.3
	T6 Instate Delivery Class 6-Elec	0	41	0	590	-	-	1	1,424	1	1,424	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	0	0	2	7	5	15	-	-	5	15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 7-Dsl	7	6	98	84	359	290	-	-	359	290	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.3
	T6 Instate Delivery Class 7-Elec		4		60		-		209	-	209	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Delivery Class 7-NG	0	0	2	2	8	6	-	-	8	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 4-Dsl	121	78	1,404	907	4,871	2,870	-	-	4,871	2,870	0.000	0.000	0.014	0.002	0.014	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.4	3.3
	T6 Instate Other Class 4-Elec		96		1,105		-		3,814	-	3,814	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Other Class 4-NG	0	1	3	13	13	40	-	-	13	40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 5-Dsl	272	181	3,139	2,096	11,916	7,005	-	-	11,916	7,005	0.000	0.000	0.018	0.006	0.019	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	15.6	8.1
	T6 Instate Other Class 5-Elec	0	221	1	2,557	-	-	2	9,347	2	9,347	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 5-NG	1	3	8	29	29	98	-	-	29	98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 6-Dsl	189	121	2,185	1,396	7,930	4,662	-	-	7,930	4,662	0.001	0.000	0.019	0.004	0.020	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.4	5.4
	T6 Instate Other Class 6-Elec	0	147	1	1,702	-	-	1	6,212	1	6,212	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 6-NG	0	2	3	19	13	65	-	-	13	65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 7-Dsl	136	123	1,571	1,423	6,235	4,765	-	-	6,235	4,765	0.000	0.000	0.012	0.006	0.012	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.0	5.6
	T6 Instate Other Class 7-Elec		80		925		-		3,947	-	3,947	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Other Class 7-NG	3	3	37	31	164	99	-	-	164	99	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Instate Tractor Class 6-Dsl	0	0	6	3	22	13	-	-	22	13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 6-Elec	0	0	0	4	-	-	0	17	0	17	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	23	25	269	287	1,279	1,415	-	-	1,279	1,415	0.000	0.000	0.003	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.5	1.5
	T6 Instate Tractor Class 7-Elec		5		62		-		353	-	353	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 7-NG	0	0	5	6	24	27	-	-	24	27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 4-Dsl	0	0	4	5	10	14	-	-	10	14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 5-Dsl	0	0	5	6	14	20	-	-	14	20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 6-Dsl	1	1	15	27	37	51	-	-	37	51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 OOS Class 7-Dsl	1	1	25	32	270	371	-	-	270	371	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T6 Public Class 4-Dsl	15	8	74	39	500	261	-	-	500	261	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.3
	T6 Public Class 4-Elec	0	8	0	40	-	-	0	296	0	296	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	0	1	1	3	10	18	-	-	10	18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 5-Dsl	25	15	130	77	953	513	-	-	953	513	0.000	0.000	0.003	0.000	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	0.7
	T6 Public Class 5-Elec	0	15	0	78	-	-	0	577	0	577	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	1	1	6	6	48	37	-	-	48	37	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Public Class 6-Dsl	20	10	100	52	661	351	-	-	661	351	0.000	0.000	0.006	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.0	0.4
	T6 Public Class 6-Elec	0	11	0	54	-	-	0	399	0	399	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	1	1	3	4	27	26	-	-	27	26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 7-Dsl	32	20	165	105	1,407	853	-	-	1,407	853	0.000	0.000	0.011	0.001	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	1.1
	T6 Public Class 7-Elec	0	16	0	83	-	-	0	751	0	751	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	1	2	6	8	71	63	-	-	71	63	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Utility Class 5-Dsl	8	3	96	44	306	136	-	-	306	136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T6 Utility Class 5-Elec		5		67		-		212		212		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	1	0	4	1	-	-	4	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	1	1	18	8	58	26	-	-	58	26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 6-Elec		1		13		-		40		40		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	2	1	21	9	80	35	-	-	80	35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 7-Elec	0	1	0	14	-	-	0	56	0	56	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	0	0	2	0	-	-	2	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		41		817		-		3,083		3,083		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6TS-Gas	106	38	2,123	764	5,039	2,286	-	-	5,039	2,286	0.004	0.000	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.2	3.9
	T7 CAIRP Class 8-Dsl	75	84	1,716	1,940	14,943	16,852	-	-	14,943	16,852	0.001	0.001	0.040	0.032	0.042	0.034	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.003	27.6	25.4
	T7 CAIRP Class 8-Elec	0	23	4	529	-	-	16	4,763	16	4,763	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 CAIRP Class 8-NG	0	0	4	4	33	31	-	-	33	31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 NNOOS Class 8-Dsl	67	93	1,545	2,137	17,801	25,700	-	-	17,801	25,700	0.001	0.002	0.044	0.057	0.047	0.061	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	32.5	36.8
	T7 NOOS Class 8-Dsl	28	40	647	924	6,468	9,339	-	-	6,468	9,339	0.001	0.001	0.018	0.023	0.019	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	12.0	13.5

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T7 Other Port Class 8-Dsl	8	9	126	143	1,444	2,072	-	-	1,444	2,072	0.000	0.000	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.7	3.2
	T7 Other Port Class 8-Elec	0	2	0	33	-	-	0	522	0	522	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	50	68	825	1,116	5,070	7,873	-	-	5,070	7,873	0.000	0.000	0.014	0.015	0.015	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	9.7	12.3
	T7 POAK Class 8-Elec	0	16	1	261	-	-	1	1,819	1	1,819	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-NG	0	0	0	3	2	18	-	-	2	18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	91	60	467	308	3,890	2,410	-	-	3,890	2,410	0.001	0.000	0.041	0.006	0.042	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.4	4.4
	T7 Public Class 8-Elec	0	44	0	224	-	-	1	1,980	1	1,980	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Public Class 8-NG	0	1	2	3	22	20	-	-	22	20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Single Concrete/Transit Mix Class 8-Dsl	55	30	520	282	3,882	2,015	-	-	3,882	2,015	0.000	0.000	0.007	0.003	0.008	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	7.3	3.3
	T7 Single Concrete/Transit Mix Class 8-Elec	0	43	0	401	-	-	1	3,001	1	3,001	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	2	2	22	17	168	124	-	-	168	124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T7 Single Dump Class 8-Dsl	51	37	479	349	2,989	1,860	-	-	2,989	1,860	0.000	0.000	0.008	0.004	0.008	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.8	3.1
	T7 Single Dump Class 8-Elec		34		325		-		2,066	-	2,066	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T7 Single Dump Class 8-NG	3	2	29	22	197	116	-	-	197	116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T7 Single Other Class 8-Dsl	111	124	1,045	1,166	5,956	4,147	-	-	5,956	4,147	0.000	0.000	0.014	0.009	0.015	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	11.3	7.1
	T7 Single Other Class 8-Elec	0	121	1	1,135	-	-	2	4,775	2	4,775	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Other Class 8-NG	7	8	67	73	399	257	-	-	399	257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.4
	T7 SWCV Class 8-Dsl	25	2	113	9	1,590	119	-	-	1,590	119	0.000	0.000	0.017	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.2	0.5
	T7 SWCV Class 8-Elec	0	22	0	102	-	-	0	1,443	0	1,443	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 SWCV Class 8-NG	18	24	84	110	1,179	1,558	-	-	1,179	1,558	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	2.3
	T7 Tractor Class 8-Dsl	148	241	2,145	3,507	11,499	14,448	-	-	11,499	14,448	0.001	0.001	0.036	0.039	0.038	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.002	21.1	21.8
	T7 Tractor Class 8-Elec	0	49	2	709	-	-	5	3,168	5	3,168	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Tractor Class 8-NG	20	21	287	303	1,559	1,242	-	-	1,559	1,242	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	1.7
	T7 Utility Class 8-Dsl	5	4	68	46	245	146	-	-	245	146	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.3
	T7 Utility Class 8-Elec	0	3	0	36	-	-	0	129	0	129	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		0		1		-		10		10		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	0	0	9	1	45	8	-	-	45	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	UBUS-Dsl	15	0	62	0	2,503	0	-	-	2,503	0	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.2	0.0
	UBUS-Elec	0	31	0	125	-	-	0	4,099	0	4,099	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	UBUS-Gas	23	18	90	71	1,460	984	-	-	1,460	984	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	0.9
	UBUS-NG	4	0	17	0	435	0	-	-	435	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.0
San Francisco	All Other Buses-Dsl	580	758	5,166	6,749	28,919	33,026	-	-	28,919	33,026	0.003	0.000	0.052	0.028	0.054	0.029	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.001	0.002	0.000	0.000	0.003	0.002	37.4	37.3
	All Other Buses-NG	9	16	82	143	423	677	-	-	423	677	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.7
	LDA-Dsl	506	64	2,150	289	13,697	2,161	-	-	13,697	2,161	0.001	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	3.8	0.5
	LDA-Elec	6,897	14,060	34,216	66,373	-	-	304,315	564,915	304,315	564,915	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.002	-	-	0.001	0.003	0.003	0.005	0.004	0.008	-	-
	LDA-Gas	106,785	100,243	495,318	471,102	3,809,177	3,718,234	-	-	3,809,177	3,718,234	0.631	0.245	0.296	0.144	0.373	0.180	0.007	0.003	0.013	0.013	0.008	0.008	0.029	0.024	0.008	0.003	0.037	0.036	0.034	0.033	0.079	0.072	1,245.5	1,031.9
	LDA-Phe	2,695	4,737	11,146	19,587	61,804	72,630	60,384	105,800	122,188	178,431	0.005	0.010	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.002	21.5	27.5
	LDT1-Dsl	7	0	22	0	75	3	-	-	75	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDT1-Elec	25	241	116	1,124	-	-	916	9,330	916	9,330	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	10,994	7,620	49,581	34,631	337,596	237,675	-	-	337,596	237,675	0.098	0.026	0.050	0.011	0.063	0.014	0.001	0.000	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.000	0.004	0.003	0.003	0.002	0.008	0.005	130.9	76.5
	LDT1-Phe	8	183	33	757	166	2,467	193	3,598	359	6,065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.9
	LDT2-Dsl	259	248	1,228	1,142	9,075	7,973	-	-	9,075	7,973	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.4	2.5
	LDT2-Elec	197	2,597	1,006	12,162	-	-	7,097	70,404	7,097	70,404	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	LDT2-Gas	51,000	63,800	240,413	294,515	1,775,159	2,066,257	-	-	1,775,159	2,066,257	0.271	0.201	0.184	0.105	0.232	0.131	0.004	0.002	0.007	0.009	0.004	0.005	0.015	0.015	0.004	0.002	0.021	0.026	0.016	0.018	0.041	0.046	719.2	692.4
	LDT2-Phe	314	1,763	1,299	7,289	6,628	23,612	7,126	34,379	13,754	57,991	0.000	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	2.3	9.1
	LHD1-Dsl	1,169	1,579	14,701	19,862	52,586	56,594	-	-	52,586	56,594	0.008	0.005	0.064	0.013	0.068	0.013	0.002	0.001	0.002	0.002	0.000	0.000	0.003	0.003	0.002	0.001	0.005	0.005	0.001	0.001	0.007	0.007	36.9	37.2
	LHD1-Elec		3,489		48,867		-		145,117		145,117		-		-		-		-		0.002		0.000		0.003		-		0.006		0.001		0.008		-
	LHD1-Gas	3,995	2,530	59,522	37,692	156,311	90,171	-	-	156,311	90,171	0.049	0.020	0.062	0.016	0.072	0.019	0.000	0.000	0.005	0.003	0.000	0.000	0.005	0.003	0.000	0.000	0.013	0.008	0.001	0.001	0.015	0.009	151.3	74.1
	LHD2-Dsl	740	795	9,304	9,998	31,372	26,837	-	-	31,372	26,837	0.005	0.003	0.033	0.008	0.035	0.009	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.003	0.003	0.000	0.000	0.005	0.004	26.8	20.7
	LHD2-Elec		873		11,553		-		35,174		35,174		-		-		-		-		0.001		0.000		0.001		-		0.002		0.000		0.002		-
	LHD2-Gas	501	297	7,459	4,418	19,069	10,322	-	-	19,069	10,322	0.006	0.002	0.008	0.002	0.009	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.001	20.8	9.5
	MCY-Gas	8,279	6,700	16,558	13,400	46,336	35,530	-	-	46,336	35,530	0.276	0.198	0.031	0.018	0.037	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	9.4	7.6
	MDV-Dsl	399	404	1,886	1,846	15,078	13,867	-	-	15,078	13,867	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.4	5.6
	MDV-Elec	204	2,396	1,047	11,155	-	-	7,418	63,947	7,418	63,947	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	MDV-Gas	20,236	36,532	95,445	168,305	773,187	1,277,408	-	-	773,187	1,277,408	0.127	0.120	0.097	0.065	0.122	0.081	0.001	0.001	0.003	0.006	0.002	0.003	0.006	0.010	0.002	0.001	0.009	0.016	0.007	0.011	0.018	0.029	373.0	517.8
	MDV-Phe	153	1,125	633	4,652	3,461	16,073	3,613	23,408	7,073	39,481	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	1.2	6.2
	MH-Dsl	83	204	8	20	950	2,044	-	-	950	2,044	0.000	0.000	0.004	0.005	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	2.4
	MH-Gas	215	335	22	34	2,105	3,745	-	-	2,105	3,745	0.003	0.001	0.001	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.5	8.0
	Motor Coach-Dsl	33	42	764	960	4,739	5,260	-	-	4,739	5,260	0.000	0.000	0.012	0.007	0.013	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	9.6	9.1
	OBUS-Elec		29		573		-		1,819		1,819		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	192	50	3,833	1,000	9,726	1,474	-	-	9,726	1,474	0.003	0.001	0.005	0.001	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	19.2	2.5
	PTO-Dsl					3,447	2,173	-	-	3,447	2,173	0.000	0.000	0.011	0.006	0.011	0.006	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	7.8	4.1
	PTO-Elec					-	-	1	2,424	1	2,424	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	125	60	1,816	867	3,146	1,321	-	-	3,146	1,321	0.000	0.000	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.3	1.6
	SBUS-Elec		20		1,213		-		2,973	-	2,973	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	91	19	363	76	4,772	975	-	-	4,772	975	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.5	0.8
	SBUS-NG	14	4	209	60	368	89	-	-	368	89	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.1
	T6 CAIRP Class 4-Dsl	2	1	43	24	125	73	-	-	125	73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 CAIRP Class 4-Elec	0	2	0	35	-	-	0	111	0	111	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	2	1	57	29	171	100	-	-	171	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 CAIRP Class 5-Elec	0	2	0	43	-	-	0	152	0	152	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	8	6	181	133	448	260	-	-	448	260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.3
	T6 CAIRP Class 6-Elec	0	8	0	195	-	-	1	396	1	396	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	14	16	312	364	2,811	3,115	-	-	2,811	3,115	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.3	3.1
	T6 CAIRP Class 7-Elec	0	5	0	114	-	-	1	1,004	1	1,004	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	299	195	4,261	2,788	10,191	6,468	-	-	10,191	6,468	0.000	0.000	0.022	0.007	0.023	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	13.9	7.7
	T6 Instate Delivery Class 4-Elec	0	244	2	3,475	-	-	3	8,423	3	8,423	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	1	3	13	39	34	91	-	-	34	91	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 5-Dsl	230	154	3,282	2,199	8,019	5,099	-	-	8,019	5,099	0.001	0.000	0.019	0.005	0.020	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.9	6.1
	T6 Instate Delivery Class 5-Elec	0	191	2	2,730	-	-	2	6,616	2	6,616	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	1	2	9	31	25	71	-	-	25	71	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 6-Dsl	376	249	5,368	3,550	12,938	8,230	-	-	12,938	8,230	0.001	0.000	0.030	0.008	0.031	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	17.5	9.8
	T6 Instate Delivery Class 6-Elec	0	309	3	4,411	-	-	4	10,690	4	10,690	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	1	3	21	49	53	115	-	-	53	115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Instate Delivery Class 7-Dsl	80	74	1,142	1,061	4,420	3,759	-	-	4,420	3,759	0.000	0.000	0.009	0.004	0.009	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.8	4.5

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 Instate Delivery Class 7-Elec	0	52	0	746	-	-	0	2,764	0	2,764	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 7-NG	1	1	21	20	82	72	-	-	82	72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Instate Other Class 4-Dsl	255	169	2,947	1,957	10,615	6,598	-	-	10,615	6,598	0.001	0.000	0.026	0.005	0.027	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	13.8	7.6
	T6 Instate Other Class 4-Elec	0	210	1	2,424	-	-	2	8,902	2	8,902	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 4-NG	1	2	7	27	29	93	-	-	29	93	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 5-Dsl	380	265	4,394	3,069	16,664	10,353	-	-	16,664	10,353	0.000	0.000	0.026	0.008	0.028	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	21.8	11.9
	T6 Instate Other Class 5-Elec	0	329	3	3,807	-	-	5	13,983	5	13,983	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 5-NG	1	4	12	43	45	145	-	-	45	145	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 6-Dsl	333	228	3,847	2,635	14,302	8,887	-	-	14,302	8,887	0.001	0.000	0.029	0.007	0.031	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	18.5	10.2
	T6 Instate Other Class 6-Elec	0	282	3	3,265	-	-	5	11,995	5	11,995	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 6-NG	1	3	9	37	35	125	-	-	35	125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 7-Dsl	175	170	2,020	1,963	8,360	6,695	-	-	8,360	6,695	0.000	0.000	0.014	0.007	0.015	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.7	7.8
	T6 Instate Other Class 7-Elec	0	116	1	1,338	-	-	2	5,759	2	5,759	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 7-NG	4	4	52	42	235	139	-	-	235	139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Instate Tractor Class 6-Dsl	2	2	29	20	128	79	-	-	128	79	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Instate Tractor Class 6-Elec		2		25		-		108	-	108	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	0	0	1	-	-	0	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	6	7	66	86	340	403	-	-	340	403	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.4
	T6 Instate Tractor Class 7-Elec	0	2	0	19	-	-	0	101	0	101	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	0	0	2	2	10	8	-	-	10	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 OOS Class 4-Dsl	1	1	22	30	64	93	-	-	64	93	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 5-Dsl	1	2	29	37	87	128	-	-	87	128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 6-Dsl	4	7	93	169	228	334	-	-	228	334	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.4
	T6 OOS Class 7-Dsl	7	9	151	207	1,660	2,431	-	-	1,660	2,431	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	2.3
	T6 Public Class 4-Dsl	92	45	473	231	3,038	1,570	-	-	3,038	1,570	0.000	0.000	0.026	0.001	0.026	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.5	2.0
	T6 Public Class 4-Elec	0	49	0	252	-	-	0	1,888	0	1,888	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	2	3	8	16	69	111	-	-	69	111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 5-Dsl	112	66	575	340	4,281	2,305	-	-	4,281	2,305	0.000	0.000	0.012	0.002	0.013	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.1	2.9
	T6 Public Class 5-Elec	0	71	0	365	-	-	0	2,723	0	2,723	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	6	5	30	24	240	166	-	-	240	166	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 Public Class 6-Dsl	71	37	364	190	2,442	1,292	-	-	2,442	1,292	0.000	0.000	0.018	0.001	0.019	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.6	1.6
	T6 Public Class 6-Elec	0	40	0	205	-	-	1	1,528	1	1,528	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	2	3	11	14	93	92	-	-	93	92	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 7-Dsl	177	107	908	548	7,563	4,554	-	-	7,563	4,554	0.001	0.000	0.055	0.004	0.057	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	11.0	5.6
	T6 Public Class 7-Elec	0	90	0	464	-	-	3	4,233	3	4,233	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	7	8	35	40	375	334	-	-	375	334	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.4
	T6 Utility Class 5-Dsl	4	2	51	23	161	73	-	-	161	73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Utility Class 5-Elec		3		36		-		114		114		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	1	0	2	1	-	-	2	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	3	1	40	18	127	58	-	-	127	58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Utility Class 6-Elec		2		28		-		90		90		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	1	0	3	0	-	-	3	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	1	0	11	5	42	19	-	-	42	19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 7-Elec	0	1	0	7	-	-	0	30	0	30	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		166		3,320		-		10,269		10,269		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6TS-Gas	549	159	10,976	3,173	26,865	7,572	-	-	26,865	7,572	0.012	0.002	0.018	0.002	0.022	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	54.9	12.8
	T7 CAIRP Class 8-Dsl	40	55	930	1,272	8,384	11,341	-	-	8,384	11,341	0.001	0.001	0.022	0.021	0.023	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	15.4	17.1
	T7 CAIRP Class 8-Elec	0	15	2	353	-	-	10	3,258	10	3,258	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 CAIRP Class 8-NG	0	0	2	2	19	21	-	-	19	21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 NNOOS Class 8-Dsl	36	61	839	1,412	9,987	17,358	-	-	9,987	17,358	0.001	0.001	0.024	0.038	0.026	0.041	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	0.000	0.001	0.002	0.003	18.2	24.8
	T7 NOOS Class 8-Dsl	15	26	351	609	3,629	6,307	-	-	3,629	6,307	0.000	0.000	0.010	0.015	0.010	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	6.7	9.1
	T7 Other Port Class 8-Dsl	4	4	65	63	742	915	-	-	742	915	0.000	0.000	0.002	0.001	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	1.4
	T7 Other Port Class 8-Elec	0	1	0	15	-	-	0	230	0	230	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	26	30	424	493	2,605	3,479	-	-	2,605	3,479	0.000	0.000	0.007	0.007	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	5.0	5.4
	T7 POAK Class 8-Elec	0	7	0	115	-	-	1	804	1	804	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-NG	0	0	0	1	1	8	-	-	1	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	375	238	1,925	1,222	15,842	9,706	-	-	15,842	9,706	0.003	0.001	0.171	0.024	0.179	0.026	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.001	0.000	0.004	0.002	34.1	17.5
	T7 Public Class 8-Elec	0	186	1	953	-	-	3	8,496	3	8,496	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 Public Class 8-NG	1	2	7	10	70	78	-	-	70	78	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 Single Concrete/Transit Mix Class 8-Dsl	23	12	221	110	1,725	790	-	-	1,725	790	0.000	0.000	0.003	0.001	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.3	1.3
	T7 Single Concrete/Transit Mix Class 8-Elec	0	17	0	157	-	-	1	1,177	1	1,177	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	2	1	15	7	121	49	-	-	121	49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T7 Single Dump Class 8-Dsl	134	90	1,261	850	8,412	4,528	-	-	8,412	4,528	0.000	0.000	0.020	0.009	0.021	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	16.3	7.7
	T7 Single Dump Class 8-Elec		84		789		-		5,021	-	5,021	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T7 Single Dump Class 8-NG	9	6	84	54	601	285	-	-	601	285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	0.4
	T7 Single Other Class 8-Dsl	113	134	1,063	1,264	6,164	4,989	-	-	6,164	4,989	0.000	0.000	0.015	0.011	0.016	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	11.6	8.5
	T7 Single Other Class 8-Elec	0	139	1	1,311	-	-	3	6,007	3	6,007	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 Single Other Class 8-NG	6	8	55	77	336	306	-	-	336	306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.4
	T7 SWCV Class 8-Dsl	195	14	897	66	12,650	928	-	-	12,650	928	0.001	0.000	0.123	0.004	0.129	0.004	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.004	0.000	56.7	3.9
	T7 SWCV Class 8-Elec	0	197	0	905	-	-	1	12,743	1	12,743	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 SWCV Class 8-NG	170	208	782	958	11,007	13,502	-	-	11,007	13,502	0.001	0.000	0.026	0.003	0.028	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.001	0.003	0.004	19.9	19.8
	T7 Tractor Class 8-Dsl	106	191	1,546	2,779	8,838	14,110	-	-	8,838	14,110	0.001	0.001	0.026	0.034	0.028	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	16.2	20.9
	T7 Tractor Class 8-Elec	0	40	1	581	-	-	3	3,193	3	3,193	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Tractor Class 8-NG	22	17	316	244	1,822	1,229	-	-	1,822	1,229	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.6	1.6
	T7 Utility Class 8-Dsl	13	9	166	111	610	360	-	-	610	360	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.6
	T7 Utility Class 8-Elec		7		94		-		341	-	341	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T7IS-Elec		0		4		-		33		33		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	3	0	64	4	107	26	-	-	107	26	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.1
	UBUS-Dsl	645	3	2,579	12	52,235	64	-	-	52,235	64	0.004	0.000	0.024	0.000	0.024	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.003	0.000	0.000	0.000	0.006	0.000	0.002	0.000	0.009	0.000	75.7	0.0
	UBUS-Elec	0	688	0	2,753	-	-	0	56,109	0	56,109	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-	0.000	0.003	0.000	0.002	0.000	0.006	-	-
	UBUS-Gas	110	106	441	425	5,383	5,279	-	-	5,383	5,279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	5.7	4.9
	UBUS-NG	49	1	195	5	4,240	26	-	-	4,240	26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	5.6	0.0
San Mateo	All Other Buses-Dsl	838	1,339	7,456	11,915	55,540	67,692	-	-	55,540	67,692	0.001	0.001	0.056	0.045	0.059	0.047	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.003	0.001	0.001	0.004	0.005	71.9	75.6
	All Other Buses-NG	6	25	50	220	353	1,317	-	-	353	1,317	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	1.2

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	LDA-Dsl	708	148	2,998	676	16,914	3,230	-	-	16,914	3,230	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.4	0.7
	LDA-Elec	13,849	33,371	69,029	157,653	-	-	535,657	862,623	535,657	862,623	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.002	0.002	0.003	-	-	0.003	0.004	0.005	0.008	0.007	0.012	-	-
	LDA-Gas	204,246	238,329	959,594	1,120,520	6,565,957	5,602,217	-	-	6,565,957	5,602,217	1.088	0.588	0.504	0.271	0.632	0.338	0.011	0.004	0.017	0.017	0.014	0.012	0.042	0.033	0.012	0.004	0.048	0.048	0.058	0.049	0.118	0.101	2,046.2	1,462.6
	LDA-Phe	5,889	11,269	24,350	46,596	111,961	109,742	112,855	159,776	224,816	269,518	0.010	0.025	0.003	0.006	0.004	0.007	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.004	34.5	38.4
	LDT1-Dsl	7	0	19	2	87	8	-	-	87	8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDT1-Elec	63	1,040	304	4,840	-	-	2,188	25,607	2,188	25,607	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	20,866	32,006	95,042	146,452	622,221	690,966	-	-	622,221	690,966	0.190	0.101	0.102	0.039	0.129	0.048	0.001	0.001	0.002	0.003	0.001	0.002	0.005	0.005	0.002	0.001	0.005	0.007	0.005	0.006	0.013	0.014	227.3	208.5
	LDT1-Phe	29	791	122	3,271	568	7,182	665	10,472	1,233	17,654	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	2.6
	LDT2-Dsl	460	1,044	2,217	4,829	15,533	23,090	-	-	15,533	23,090	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	5.3	6.5
	LDT2-Elec	727	11,210	3,730	52,366	-	-	22,837	193,105	22,837	193,105	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.002	0.000	0.003	-	-
	LDT2-Gas	118,295	271,904	567,814	1,257,469	4,007,860	6,014,050	-	-	4,007,860	6,014,050	0.536	0.811	0.367	0.380	0.462	0.472	0.007	0.004	0.012	0.022	0.009	0.013	0.027	0.040	0.007	0.005	0.034	0.064	0.035	0.053	0.076	0.122	1,512.4	1,892.0
	LDT2-Phe	1,099	7,607	4,544	31,455	21,207	68,716	23,177	100,005	44,384	168,720	0.002	0.018	0.001	0.004	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.002	6.6	24.6
	LHD1-Dsl	3,889	6,843	48,920	86,078	152,677	155,952	-	-	152,677	155,952	0.025	0.015	0.206	0.037	0.217	0.039	0.005	0.003	0.005	0.005	0.001	0.001	0.010	0.008	0.005	0.003	0.013	0.013	0.002	0.002	0.020	0.019	105.9	102.9
	LHD1-Elec		15,058		210,896		-		397,495		397,495		-		-		-		-		0.006		0.001		0.007		-		0.017		0.004		0.021		-
	LHD1-Gas	8,983	10,581	133,832	157,640	333,529	244,330	-	-	333,529	244,330	0.097	0.078	0.123	0.063	0.142	0.072	0.001	0.000	0.010	0.007	0.001	0.001	0.011	0.008	0.001	0.000	0.029	0.021	0.003	0.002	0.032	0.024	314.3	201.5
	LHD2-Dsl	1,659	3,277	20,870	41,214	66,104	72,105	-	-	66,104	72,105	0.010	0.008	0.065	0.021	0.068	0.022	0.002	0.002	0.002	0.003	0.000	0.000	0.004	0.004	0.002	0.002	0.007	0.007	0.001	0.001	0.009	0.010	54.5	55.6
	LHD2-Elec		3,769		49,868		-		96,391		96,391		-		-		-		-		0.002		0.000		0.002		-		0.005		0.001		0.006		-
	LHD2-Gas	1,046	1,240	15,586	18,468	37,004	27,899	-	-	37,004	27,899	0.011	0.009	0.015	0.006	0.017	0.007	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.004	0.003	0.000	0.000	0.004	0.003	39.4	25.9
	MCY-Gas	10,652	24,628	21,305	49,256	62,724	93,289	-	-	62,724	93,289	0.326	0.627	0.036	0.046	0.043	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	12.1	18.8
	MDV-Dsl	941	1,712	4,508	7,849	32,210	37,672	-	-	32,210	37,672	0.000	0.000	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	14.5	13.6
	MDV-Elec	770	10,356	3,957	48,102	-	-	24,257	175,585	24,257	175,585	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.002	0.000	0.002	-	-
	MDV-Gas	66,613	157,713	318,128	725,338	2,297,775	3,495,072	-	-	2,297,775	3,495,072	0.364	0.506	0.260	0.229	0.328	0.285	0.004	0.003	0.007	0.013	0.005	0.008	0.016	0.023	0.004	0.003	0.020	0.038	0.020	0.031	0.044	0.071	1,045.1	1,332.7
	MDV-Phe	576	4,866	2,383	20,119	11,427	44,013	11,980	64,094	23,407	108,107	0.001	0.012	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	3.6	16.1
	MH-Dsl	279	896	28	90	2,963	5,663	-	-	2,963	5,663	0.000	0.000	0.010	0.014	0.011	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.5	6.7
	MH-Gas	658	1,459	66	146	6,324	10,287	-	-	6,324	10,287	0.005	0.003	0.002	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	13.4	21.8
	Motor Coach-Dsl	56	84	1,286	1,936	7,972	10,610	-	-	7,972	10,610	0.000	0.001	0.021	0.014	0.022	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	16.2	18.4
	OBUS-Elec		123		2,463		-		6,009		6,009		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	218	136	4,362	2,711	12,896	4,293	-	-	12,896	4,293	0.003	0.002	0.006	0.002	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	24.7	7.1
	PTO-Dsl					4,401	3,455	-	-	4,401	3,455	0.000	0.000	0.014	0.009	0.015	0.010	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	10.1	6.5
	PTO-Elec					-	-	1	3,751	1	3,751	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	143	81	2,077	1,178	3,223	1,694	-	-	3,223	1,694	0.000	0.000	0.022	0.002	0.023	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.4	2.1
	SBUS-Elec		86		1,582		-		5,471	-	5,471	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	53	84	211	338	2,899	3,369	-	-	2,899	3,369	0.001	0.002	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.7	2.8
	SBUS-NG	5	5	74	69	130	100	-	-	130	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 CAIRP Class 4-Dsl	2	1	38	26	110	79	-	-	110	79	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 4-Elec	0	2	0	38	-	-	0	121	0	121	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	2	1	51	31	151	109	-	-	151	109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 CAIRP Class 5-Elec	0	2	0	46	-	-	0	166	0	166	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	7	6	161	143	395	284	-	-	395	284	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.3
	T6 CAIRP Class 6-Elec	0	9	0	211	-	-	1	434	1	434	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	12	17	278	393	2,480	3,402	-	-	2,480	3,402	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.9	3.3
	T6 CAIRP Class 7-Elec	0	5	0	123	-	-	1	1,101	1	1,101	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	309	245	4,406	3,501	10,421	8,149	-	-	10,421	8,149	0.001	0.000	0.034	0.008	0.035	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	14.3	9.7
	T6 Instate Delivery Class 4-Elec	0	309	3	4,413	-	-	4	10,722	4	10,722	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	1	3	14	49	38	115	-	-	38	115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 5-Dsl	245	200	3,502	2,847	8,501	6,630	-	-	8,501	6,630	0.000	0.000	0.017	0.007	0.018	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	11.5	7.9
	T6 Instate Delivery Class 5-Elec	0	252	2	3,603	-	-	2	8,754	2	8,754	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	1	3	10	40	26	92	-	-	26	92	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 6-Dsl	515	414	7,349	5,911	17,641	13,763	-	-	17,641	13,763	0.001	0.000	0.042	0.014	0.043	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	23.9	16.4
	T6 Instate Delivery Class 6-Elec	0	524	4	7,478	-	-	6	18,161	6	18,161	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 6-NG	1	6	20	82	52	193	-	-	52	193	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Delivery Class 7-Dsl	125	142	1,783	2,022	6,905	7,203	-	-	6,905	7,203	0.000	0.000	0.012	0.008	0.013	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.1	8.6
	T6 Instate Delivery Class 7-Elec	0	104	0	1,479	-	-	0	5,494	0	5,494	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 7-NG	3	3	44	43	175	152	-	-	175	152	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 Instate Other Class 4-Dsl	355	279	4,105	3,221	14,293	10,940	-	-	14,293	10,940	0.002	0.000	0.043	0.009	0.045	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	18.7	12.6
	T6 Instate Other Class 4-Elec	0	351	2	4,052	-	-	3	14,924	3	14,924	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 4-NG	1	4	11	45	43	155	-	-	43	155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.2
	T6 Instate Other Class 5-Dsl	838	715	9,689	8,269	36,789	28,109	-	-	36,789	28,109	0.001	0.000	0.058	0.022	0.061	0.023	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.002	48.2	32.4
	T6 Instate Other Class 5-Elec	0	902	5	10,431	-	-	9	38,427	9	38,427	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-
	T6 Instate Other Class 5-NG	2	10	23	115	87	395	-	-	87	395	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	T6 Instate Other Class 6-Dsl	543	452	6,276	5,226	23,233	17,759	-	-	23,233	17,759	0.001	0.000	0.047	0.014	0.049	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	30.3	20.4
	T6 Instate Other Class 6-Elec	0	570	3	6,585	-	-	6	24,256	6	24,256	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 6-NG	1	6	14	73	54	250	-	-	54	250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.3
	T6 Instate Other Class 7-Dsl	224	266	2,587	3,072	10,847	10,638	-	-	10,847	10,638	0.000	0.000	0.018	0.011	0.019	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	13.9	12.3
	T6 Instate Other Class 7-Elec	0	186	1	2,151	-	-	3	9,349	3	9,349	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 7-NG	5	6	62	65	285	217	-	-	285	217	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 Instate Tractor Class 6-Dsl	8	7	95	82	454	344	-	-	454	344	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.4
	T6 Instate Tractor Class 6-Elec		9		103		-		478	-	478	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	1	1	5	-	-	1	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	52	84	601	969	3,177	4,612	-	-	3,177	4,612	0.000	0.000	0.005	0.004	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.9	4.8
	T6 Instate Tractor Class 7-Elec	0	19	0	218	-	-	0	1,178	0	1,178	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	1	2	11	19	62	89	-	-	62	89	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 4-Dsl	1	2	21	36	62	112	-	-	62	112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 5-Dsl	1	2	29	44	85	154	-	-	85	154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 OOS Class 6-Dsl	4	9	91	200	221	402	-	-	221	402	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.4
	T6 OOS Class 7-Dsl	6	11	148	245	1,609	2,919	-	-	1,609	2,919	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	2.7
	T6 Public Class 4-Dsl	29	17	151	85	993	571	-	-	993	571	0.000	0.000	0.008	0.001	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.5	0.7
	T6 Public Class 4-Elec	0	17	0	89	-	-	0	663	0	663	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	1	1	5	6	40	41	-	-	40	41	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Public Class 5-Dsl	89	57	454	295	3,288	1,978	-	-	3,288	1,978	0.000	0.000	0.013	0.002	0.013	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.7	2.5
	T6 Public Class 5-Elec	0	60	0	308	-	-	0	2,279	0	2,279	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	7	5	35	23	284	153	-	-	284	153	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T6 Public Class 6-Dsl	57	34	295	172	1,987	1,156	-	-	1,987	1,156	0.000	0.000	0.014	0.001	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.9	1.5
	T6 Public Class 6-Elec	0	35	0	179	-	-	1	1,324	1	1,324	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	2	2	11	13	88	84	-	-	88	84	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 7-Dsl	124	85	638	437	5,400	3,584	-	-	5,400	3,584	0.001	0.000	0.040	0.003	0.042	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	7.9	4.4
	T6 Public Class 7-Elec	0	69	0	355	-	-	2	3,210	2	3,210	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	6	6	30	33	318	268	-	-	318	268	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.3

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 Utility Class 5-Dsl	7	3	90	45	287	140	-	-	287	140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T6 Utility Class 5-Elec		5		69		-		218		218		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	1	0	4	1	-	-	4	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	1	1	17	8	54	26	-	-	54	26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 6-Elec		1		13		-		41		41		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	2	1	19	9	75	36	-	-	75	36	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 7-Elec	0	1	0	14	-	-	0	58	0	58	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		715		14,308		-		34,015		34,015		-		-		-		-		0.000		0.000		0.000		-		0.001		0.000		0.001		-
	T6TS-Gas	663	645	13,264	12,911	39,084	24,949	-	-	39,084	24,949	0.015	0.008	0.025	0.008	0.029	0.009	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002	76.0	42.3
	T7 CAIRP Class 8-Dsl	71	112	1,629	2,567	14,459	23,089	-	-	14,459	23,089	0.001	0.002	0.038	0.043	0.041	0.046	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.004	26.6	34.7
	T7 CAIRP Class 8-Elec	0	31	4	716	-	-	16	6,668	16	6,668	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 CAIRP Class 8-NG	0	0	4	5	32	42	-	-	32	42	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 NNOOS Class 8-Dsl	64	124	1,468	2,856	17,224	35,381	-	-	17,224	35,381	0.001	0.002	0.042	0.077	0.045	0.082	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.003	0.001	0.001	0.001	0.003	0.001	0.001	0.003	0.006	31.4	50.6
	T7 NOOS Class 8-Dsl	27	54	614	1,230	6,259	12,856	-	-	6,259	12,856	0.001	0.001	0.017	0.030	0.018	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	11.5	18.6
	T7 Other Port Class 8-Dsl	7	8	116	136	1,332	1,970	-	-	1,332	1,970	0.000	0.000	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5	3.0
	T7 Other Port Class 8-Elec	0	2	0	31	-	-	0	496	0	496	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	46	65	761	1,062	4,677	7,487	-	-	4,677	7,487	0.000	0.000	0.013	0.014	0.014	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	8.9	11.7
	T7 POAK Class 8-Elec	0	15	0	248	-	-	1	1,730	1	1,730	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-NG	0	0	0	2	2	17	-	-	2	17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	282	206	1,447	1,056	12,288	8,300	-	-	12,288	8,300	0.002	0.000	0.123	0.021	0.128	0.022	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.002	0.001	0.000	0.000	0.003	0.001	26.3	15.0
	T7 Public Class 8-Elec	0	152	1	779	-	-	4	6,887	4	6,887	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 Public Class 8-NG	1	2	7	9	64	67	-	-	64	67	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 Single Concrete/Transit Mix Class 8-Dsl	40	24	381	223	2,918	1,592	-	-	2,918	1,592	0.000	0.000	0.005	0.002	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.5	2.6
	T7 Single Concrete/Transit Mix Class 8-Elec	0	34	1	318	-	-	4	2,360	4	2,360	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	2	1	22	14	175	98	-	-	175	98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T7 Single Dump Class 8-Dsl	144	112	1,354	1,055	8,826	5,618	-	-	8,826	5,618	0.000	0.000	0.022	0.011	0.023	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	17.0	9.5
	T7 Single Dump Class 8-Elec		104		978		-		6,210	-	6,210	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.001	-	-
	T7 Single Dump Class 8-NG	7	7	70	64	478	343	-	-	478	343	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.5
	T7 Single Other Class 8-Dsl	149	132	1,400	1,245	9,153	9,174	-	-	9,153	9,174	0.000	0.000	0.022	0.015	0.023	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	17.5	15.3
	T7 Single Other Class 8-Elec	0	124	1	1,164	-	-	3	10,321	3	10,321	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 Single Other Class 8-NG	9	8	89	79	615	576	-	-	615	576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	0.8
	T7 SWCV Class 8-Dsl	119	11	546	52	7,703	724	-	-	7,703	724	0.001	0.000	0.067	0.005	0.070	0.005	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002	0.000	34.8	3.2
	T7 SWCV Class 8-Elec	0	119	0	549	-	-	1	7,724	1	7,724	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 SWCV Class 8-NG	94	132	431	606	6,060	8,545	-	-	6,060	8,545	0.001	0.000	0.015	0.002	0.016	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	11.1	12.5
	T7 Tractor Class 8-Dsl	147	324	2,138	4,711	11,711	20,796	-	-	11,711	20,796	0.001	0.002	0.036	0.053	0.038	0.056	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	0.000	0.001	0.002	0.003	21.4	31.1
	T7 Tractor Class 8-Elec	0	68	2	992	-	-	5	4,740	5	4,740	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Tractor Class 8-NG	20	28	285	405	1,583	1,784	-	-	1,583	1,784	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	2.4
	T7 Utility Class 8-Dsl	5	4	64	47	230	149	-	-	230	149	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.3
	T7 Utility Class 8-Elec	0	3	0	38	-	-	0	135	0	135	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		1		20		-		109		109		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	4	1	73	20	504	88	-	-	504	88	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.2
	UBUS-Dsl	290	0	1,162	0	24,250	0	-	-	24,250	0	0.004	0.000	0.077	0.000	0.077	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.004	0.000	38.5	0.0
	UBUS-Elec	2	386	7	1,542	-	-	13	30,433	13	30,433	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	UBUS-Gas	52	60	208	240	3,540	3,912	-	-	3,540	3,912	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.0	3.6
	UBUS-NG	30	0	119	0	1,019	0	-	-	1,019	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	0.0
Santa Clara	All Other Buses-Dsl	657	1,010	5,844	8,991	41,566	52,011	-	-	41,566	52,011	0.002	0.001	0.059	0.036	0.061	0.038	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.003	0.001	0.001	0.004	0.003	53.4	57.7
	All Other Buses-NG	5	19	46	173	341	1,048	-	-	341	1,048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	1.0
	LDA-Dsl	1,560	362	6,669	1,652	46,862	12,371	-	-	46,862	12,371	0.002	0.000	0.012	0.000	0.013	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	12.2	2.5
	LDA-Elec	44,804	84,054	221,096	393,205	-	-	1,890,622	3,100,827	1,890,622	3,100,827	-	-	-	-	-	-	-	-	0.003	0.005	0.004	0.007	0.007	0.012	-	-	0.009	0.015	0.017	0.027	0.026	0.042	-	-
	LDA-Gas	501,739	596,034	2,330,143	2,780,923	18,646,490	21,431,368	-	-	18,646,490	21,431,368	2.969	1.549	1.458	0.842	1.836	1.056	0.030	0.014	0.054	0.069	0.041	0.047	0.126	0.131	0.033	0.016	0.155	0.198	0.164	0.189	0.352	0.402	5,889.4	5,559.8
	LDA-Phe	13,174	28,225	54,476	116,711	297,282	416,286	286,705	605,991	583,987	1,022,277	0.024	0.064	0.008	0.016	0.010	0.020	0.001	0.000	0.001	0.002	0.001	0.002	0.003	0.004	0.001	0.000	0.003	0.005	0.005	0.009	0.008	0.014	94.0	146.2
	LDT1-Dsl	22	0	63	2	327	15	-	-	327	15	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.0
	LDT1-Elec	162	1,253	764	5,836	-	-	5,892	45,617	5,892	45,617	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	LDT1-Gas	44,830	39,048	199,831	178,069	1,454,093	1,272,162	-	-	1,454,093	1,272,162	0.502	0.131	0.277	0.056	0.352	0.070	0.004	0.001	0.005	0.005	0.003	0.003	0.012	0.009	0.004	0.001	0.015	0.015	0.013	0.011	0.032	0.027	542.8	381.7
	LDT1-Phe	36	949	149	3,924	787	13,102	920	19,104	1,707	32,206	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	4.7
	LDT2-Dsl	816	1,267	3,895	5,851	30,788	42,371	-	-	30,788	42,371	0.000	0.001	0.002	0.001	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	10.7	12.0
	LDT2-Elec	922	13,471	4,720	63,062	-	-	32,451	343,994	32,451	343,994	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-	0.000	0.002	0.000	0.003	0.000	0.005	-	-
	LDT2-Gas	233,541	330,175	1,093,434	1,524,538	8,452,897	11,040,752	-	-	8,452,897	11,040,752	1.395	1.037	1.002	0.539	1.265	0.673	0.014	0.008	0.029	0.044	0.019	0.024	0.062	0.076	0.016	0.008	0.083	0.127	0.075	0.097	0.173	0.233	3,311.3	3,449.7
	LDT2-Phe	1,414	9,138	5,847	37,786	30,960	125,418	33,448	182,525	64,408	307,944	0.002	0.021	0.001	0.005	0.001	0.006	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.003	0.001	0.004	9.9	44.7
	LHD1-Dsl	8,175	8,312	102,830	104,553	320,150	278,489	-	-	320,150	278,489	0.067	0.026	0.624	0.066	0.656	0.069	0.014	0.005	0.010	0.008	0.001	0.001	0.024	0.015	0.014	0.005	0.028	0.024	0.004	0.004	0.046	0.033	223.8	183.5
	LHD1-Elec		18,101		253,535		-		708,836		708,836		-		-		-		-		0.011		0.002		0.012		-		0.030		0.006		0.037		-
	LHD1-Gas	15,988	12,759	238,199	190,094	592,718	434,454	-	-	592,718	434,454	0.238	0.096	0.278	0.080	0.322	0.091	0.001	0.001	0.018	0.013	0.001	0.001	0.020	0.015	0.001	0.001	0.051	0.037	0.005	0.004	0.057	0.042	581.6	356.6
	LHD2-Dsl	3,734	4,108	46,967	51,673	147,344	130,827	-	-	147,344	130,827	0.028	0.015	0.230	0.042	0.242	0.044	0.006	0.003	0.005	0.005	0.000	0.000	0.011	0.008	0.006	0.003	0.015	0.013	0.002	0.002	0.023	0.018	124.1	100.9
	LHD2-Elec		4,530		59,935		-		171,810		171,810		-		-		-		-		0.003		0.000		0.003		-		0.009		0.002		0.010		-
	LHD2-Gas	2,079	1,506	30,976	22,435	75,680	49,858	-	-	75,680	49,858	0.028	0.011	0.035	0.008	0.040	0.009	0.000	0.000	0.003	0.002	0.000	0.000	0.003	0.002	0.000	0.000	0.008	0.005	0.001	0.000	0.008	0.006	83.2	46.1
	MCY-Gas	23,251	31,383	46,502	62,766	137,446	168,985	-	-	137,446	168,985	0.772	0.890	0.086	0.082	0.103	0.098	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.002	0.002	0.001	0.001	0.003	0.004	26.3	33.4
	MDV-Dsl	1,980	2,105	9,392	9,596	72,380	67,614	-	-	72,380	67,614	0.001	0.000	0.004	0.001	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.001	33.0	24.7
	MDV-Elec	942	12,422	4,834	57,831	-	-	33,403	312,422	33,403	312,422	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-	0.000	0.002	0.000	0.003	0.000	0.004	-	-
	MDV-Gas	128,198	191,087	593,842	877,619	4,466,175	6,226,420	-	-	4,466,175	6,226,420	0.979	0.640	0.771	0.321	0.975	0.402	0.008	0.004	0.016	0.025	0.010	0.014	0.033	0.044	0.009	0.005	0.045	0.073	0.039	0.055	0.092	0.132	2,124.9	2,358.0
	MDV-Phe	822	5,842	3,399	24,158	17,327	78,012	17,598	113,535	34,925	191,548	0.001	0.014	0.000	0.003	0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.003	5.6	28.2
	MH-Dsl	799	1,119	80	112	7,789	10,273	-	-	7,789	10,273	0.001	0.001	0.035	0.026	0.037	0.028	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	9.2	12.2
	MH-Gas	2,103	1,784	210	179	18,794	18,502	-	-	18,794	18,502	0.020	0.004	0.009	0.004	0.011	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	39.9	39.3
	Motor Coach-Dsl	69	96	1,584	2,210	9,818	12,112	-	-	9,818	12,112	0.000	0.001	0.025	0.016	0.027	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	19.9	21.1
	OBUS-Elec		149		2,971		-		8,636		8,636		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	383	173	7,653	3,471	17,363	6,212	-	-	17,363	6,212	0.007	0.002	0.013	0.003	0.015	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	34.1	10.3
	PTO-Dsl					21,177	14,637	-	-	21,177	14,637	0.001	0.000	0.066	0.037	0.070	0.039	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	48.0	27.5
	PTO-Elec					-	-	10	16,758	10	16,758	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	556	290	8,052	4,204	12,830	6,104	-	-	12,830	6,104	0.001	0.000	0.073	0.006	0.076	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	17.5	7.4
	SBUS-Elec		106		5,049		-		12,571	-	12,571	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	139	99	557	396	6,926	4,674	-	-	6,926	4,674	0.003	0.002	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.5	3.8
	SBUS-NG	20	17	284	240	497	353	-	-	497	353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.5
	T6 CAIRP Class 4-Dsl	3	2	63	37	181	114	-	-	181	114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 CAIRP Class 4-Elec	0	2	0	54	-	-	0	173	0	173	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 CAIRP Class 5-Dsl	4	2	84	45	248	156	-	-	248	156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 CAIRP Class 5-Elec	0	3	0	66	-	-	0	237	0	237	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	12	9	265	207	647	407	-	-	647	407	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.5
	T6 CAIRP Class 6-Elec	0	13	1	304	-	-	1	620	1	620	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	20	25	458	568	4,059	4,874	-	-	4,059	4,874	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.7	4.8
	T6 CAIRP Class 7-Elec	0	8	0	177	-	-	2	1,571	2	1,571	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	523	366	7,464	5,220	17,667	12,119	-	-	17,667	12,119	0.002	0.000	0.049	0.012	0.051	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	24.0	14.4
	T6 Instate Delivery Class 4-Elec	0	458	4	6,534	-	-	6	15,843	6	15,843	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 4-NG	2	5	22	73	57	170	-	-	57	170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Delivery Class 5-Dsl	588	421	8,396	6,015	20,401	13,969	-	-	20,401	13,969	0.001	0.000	0.039	0.014	0.041	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	27.7	16.6
	T6 Instate Delivery Class 5-Elec	0	529	4	7,548	-	-	5	18,297	5	18,297	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 5-NG	1	6	19	83	50	194	-	-	50	194	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Delivery Class 6-Dsl	1,139	805	16,250	11,490	38,927	26,673	-	-	38,927	26,673	0.002	0.000	0.089	0.027	0.093	0.028	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.001	0.001	0.000	0.003	0.002	52.8	31.8
	T6 Instate Delivery Class 6-Elec	1	1,010	12	14,408	-	-	15	34,892	15	34,892	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Delivery Class 6-NG	2	11	35	159	90	372	-	-	90	372	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	T6 Instate Delivery Class 7-Dsl	148	145	2,110	2,073	8,132	7,379	-	-	8,132	7,379	0.000	0.000	0.015	0.008	0.016	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	10.8	8.8
	T6 Instate Delivery Class 7-Elec	0	107	0	1,522	-	-	1	5,646	1	5,646	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 7-NG	3	3	43	42	169	148	-	-	169	148	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 Instate Other Class 4-Dsl	926	651	10,703	7,530	37,945	25,462	-	-	37,945	25,462	0.003	0.000	0.099	0.020	0.103	0.021	0.002	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.002	0.000	0.002	0.001	0.001	0.000	0.004	0.002	49.7	29.3
	T6 Instate Other Class 4-Elec	0	813	1	9,398	-	-	2	34,536	2	34,536	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 4-NG	2	9	22	105	90	359	-	-	90	359	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	T6 Instate Other Class 5-Dsl	1,795	1,352	20,756	15,624	78,816	52,858	-	-	78,816	52,858	0.002	0.001	0.123	0.043	0.129	0.044	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.004	0.003	0.001	0.001	0.006	0.003	103.2	60.9
	T6 Instate Other Class 5-Elec	1	1,688	10	19,516	-	-	17	71,760	17	71,760	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T6 Instate Other Class 5-NG	4	19	44	217	169	742	-	-	169	742	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.8
	T6 Instate Other Class 6-Dsl	1,749	1,279	20,217	14,780	74,441	49,969	-	-	74,441	49,969	0.004	0.001	0.157	0.040	0.164	0.042	0.002	0.000	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000	0.004	0.002	0.001	0.001	0.007	0.003	96.7	57.5
	T6 Instate Other Class 6-Elec	1	1,595	13	18,435	-	-	23	67,728	23	67,728	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T6 Instate Other Class 6-NG	3	18	40	205	150	702	-	-	150	702	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.7
	T6 Instate Other Class 7-Dsl	645	683	7,460	7,898	31,314	27,069	-	-	31,314	27,069	0.001	0.000	0.051	0.029	0.054	0.030	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.002	40.2	31.4
	T6 Instate Other Class 7-Elec	0	467	3	5,401	-	-	7	23,390	7	23,390	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 7-NG	16	14	182	167	827	554	-	-	827	554	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	0.6
	T6 Instate Tractor Class 6-Dsl	7	5	83	56	350	233	-	-	350	233	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.3
	T6 Instate Tractor Class 6-Elec	0	6	0	70	-	-	0	321	0	321	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	1	1	3	-	-	1	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	202	278	2,339	3,209	12,521	15,939	-	-	12,521	15,939	0.000	0.000	0.019	0.013	0.020	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	15.3	16.5
	T6 Instate Tractor Class 7-Elec	0	61	1	707	-	-	2	4,057	2	4,057	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	4	6	48	64	276	312	-	-	276	312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.3
	T6 OOS Class 4-Dsl	2	2	35	51	100	159	-	-	100	159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 OOS Class 5-Dsl	2	3	47	63	137	218	-	-	137	218	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 OOS Class 6-Dsl	6	12	148	287	358	569	-	-	358	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.6
	T6 OOS Class 7-Dsl	10	15	241	350	2,606	4,135	-	-	2,606	4,135	0.000	0.000	0.001	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.0	3.9
	T6 Public Class 4-Dsl	117	67	600	344	3,964	2,338	-	-	3,964	2,338	0.000	0.000	0.031	0.002	0.033	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.8	2.9
	T6 Public Class 4-Elec	0	73	0	375	-	-	0	2,793	0	2,793	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	5	5	28	26	228	176	-	-	228	176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 Public Class 5-Dsl	183	118	939	608	6,843	4,108	-	-	6,843	4,108	0.000	0.000	0.025	0.004	0.026	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	9.8	5.2
	T6 Public Class 5-Elec	0	127	0	649	-	-	0	4,833	0	4,833	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	11	9	57	45	459	304	-	-	459	304	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.4
	T6 Public Class 6-Dsl	109	63	559	323	3,717	2,191	-	-	3,717	2,191	0.000	0.000	0.030	0.002	0.031	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.5	2.8
	T6 Public Class 6-Elec	0	68	0	348	-	-	1	2,591	1	2,591	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	4	5	23	24	187	162	-	-	187	162	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 Public Class 7-Dsl	254	179	1,304	919	11,360	7,589	-	-	11,360	7,589	0.001	0.000	0.077	0.006	0.080	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	16.4	9.3
	T6 Public Class 7-Elec	0	148	0	761	-	-	2	6,937	2	6,937	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	10	13	50	67	547	550	-	-	547	550	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.6
	T6 Utility Class 5-Dsl	84	43	1,080	546	3,435	1,713	-	-	3,435	1,713	0.000	0.000	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.3	2.0
	T6 Utility Class 5-Elec		66		841		-		2,681		2,681		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	1	0	15	5	47	15	-	-	47	15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 6-Dsl	16	8	205	103	649	324	-	-	649	324	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.4
	T6 Utility Class 6-Elec		12		159		-		507		507		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	3	1	9	3	-	-	9	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	18	9	233	115	898	446	-	-	898	446	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	0.5
	T6 Utility Class 7-Elec	0	14	0	177	-	-	1	710	1	710	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	5	1	17	4	-	-	17	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		861		17,220		-		48,783		48,783		-		-		-		-		0.000		0.000		0.001		-		0.001		0.001		0.002		-
	T6TS-Gas	1,183	778	23,660	15,564	59,003	35,587	-	-	59,003	35,587	0.029	0.010	0.044	0.010	0.052	0.012	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.002	0.001	0.000	0.004	0.002	116.8	60.2
	T7 CAIRP Class 8-Dsl	839	1,197	19,275	27,511	170,587	246,189	-	-	170,587	246,189	0.013	0.018	0.452	0.464	0.481	0.493	0.006	0.008	0.005	0.008	0.002	0.002	0.013	0.018	0.006	0.008	0.014	0.022	0.007	0.010	0.027	0.040	314.1	370.2
	T7 CAIRP Class 8-Elec	2	333	42	7,650	-	-	191	70,869	191	70,869	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-	0.000	0.003	0.000	0.003	0.000	0.006	-	-
	T7 CAIRP Class 8-NG	2	2	42	50	379	451	-	-	379	451	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.6
	T7 NNOOS Class 8-Dsl	755	1,330	17,359	30,564	203,216	376,981	-	-	203,216	376,981	0.014	0.025	0.496	0.826	0.528	0.881	0.007	0.012	0.006	0.012	0.002	0.004	0.015	0.027	0.007	0.012	0.017	0.034	0.008	0.015	0.032	0.061	370.8	539.0
	T7 NOOS Class 8-Dsl	316	573	7,268	13,166	73,842	136,982	-	-	73,842	136,982	0.006	0.010	0.199	0.326	0.212	0.348	0.003	0.005	0.002	0.004	0.001	0.001	0.006	0.010	0.003	0.005	0.006	0.012	0.003	0.005	0.012	0.023	136.2	198.2
	T7 Other Port Class 8-Dsl	84	91	1,382	1,497	15,852	21,740	-	-	15,852	21,740	0.001	0.001	0.036	0.034	0.038	0.036	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.002	0.004	29.7	33.3
	T7 Other Port Class 8-Elec	0	21	1	345	-	-	4	5,475	4	5,475	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 POAK Class 8-Dsl	553	716	9,055	11,713	55,668	82,611	-	-	55,668	82,611	0.003	0.004	0.154	0.157	0.163	0.166	0.001	0.002	0.002	0.003	0.001	0.001	0.004	0.005	0.001	0.002	0.005	0.009	0.002	0.003	0.009	0.013	106.2	128.6
	T7 POAK Class 8-Elec	0	167	6	2,737	-	-	14	19,088	14	19,088	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 POAK Class 8-NG	0	2	4	26	22	186	-	-	22	186	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.2
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	558	403	2,860	2,065	24,087	16,360	-	-	24,087	16,360	0.004	0.001	0.247	0.041	0.258	0.043	0.001	0.000	0.001	0.001	0.000	0.000	0.003	0.001	0.001	0.000	0.003	0.002	0.001	0.001	0.005	0.003	51.6	29.5
	T7 Public Class 8-Elec	0	311	1	1,594	-	-	7	14,154	7	14,154	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-
	T7 Public Class 8-NG	2	3	11	16	111	131	-	-	111	131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T7 Single Concrete/Transit Mix Class 8-Dsl	334	181	3,145	1,707	23,910	12,163	-	-	23,910	12,163	0.001	0.001	0.047	0.017	0.049	0.018	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002	45.5	19.9
	T7 Single Concrete/Transit Mix Class 8-Elec	1	258	5	2,431	-	-	22	18,010	22	18,010	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	21	11	202	105	1,568	748	-	-	1,568	748	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	1.0
	T7 Single Dump Class 8-Dsl	550	407	5,180	3,831	34,188	20,399	-	-	34,188	20,399	0.002	0.001	0.086	0.039	0.091	0.041	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002	0.001	0.001	0.005	0.003	65.8	34.5
	T7 Single Dump Class 8-Elec		377		3,555		-		22,571	-	22,571	-	-	-	-	-	-	-	-		0.000		0.000	-	0.001	-	-		0.001		0.001	-	0.002	-	-
	T7 Single Dump Class 8-NG	35	26	327	241	2,299	1,273	-	-	2,299	1,273	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.4	1.7
	T7 Single Other Class 8-Dsl	752	905	7,087	8,524	42,018	36,856	-	-	42,018	36,856	0.002	0.002	0.102	0.075	0.107	0.079	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.004	0.004	0.002	0.001	0.006	0.006	79.7	62.5
	T7 Single Other Class 8-Elec	1	922	8	8,686	-	-	28	43,815	28	43,815	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.002	0.000	0.004	-	-
	T7 Single Other Class 8-NG	45	56	427	528	2,669	2,278	-	-	2,669	2,278	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.9	3.2

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T7 SWCV Class 8-Dsl	262	22	1,205	102	16,998	1,402	-	-	16,998	1,402	0.001	0.000	0.171	0.008	0.179	0.008	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.004	0.000	0.001	0.000	0.005	0.000	77.1	6.0
	T7 SWCV Class 8-Elec	0	322	1	1,482	-	-	4	20,845	4	20,845	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-	0.000	0.002	0.000	0.001	0.000	0.003	-	-
	T7 SWCV Class 8-NG	286	350	1,316	1,609	18,500	22,702	-	-	18,500	22,702	0.002	0.000	0.047	0.006	0.049	0.007	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.004	0.005	0.001	0.001	0.005	0.006	33.6	33.4
	T7 Tractor Class 8-Dsl	1,801	3,684	26,163	53,525	141,986	227,416	-	-	141,986	227,416	0.010	0.017	0.439	0.595	0.462	0.625	0.003	0.005	0.004	0.008	0.001	0.002	0.009	0.015	0.004	0.005	0.012	0.022	0.006	0.009	0.022	0.036	259.6	341.2
	T7 Tractor Class 8-Elec	2	773	22	11,230	-	-	63	51,620	63	51,620	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-	0.000	0.002	0.000	0.002	0.000	0.005	-	-
	T7 Tractor Class 8-NG	236	317	3,433	4,599	18,876	19,491	-	-	18,876	19,491	0.001	0.001	0.016	0.011	0.016	0.011	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.002	0.003	27.3	26.9
	T7 Utility Class 8-Dsl	60	43	763	557	2,749	1,801	-	-	2,749	1,801	0.000	0.000	0.008	0.005	0.009	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.3	3.1
	T7 Utility Class 8-Elec	0	37	0	468	-	-	1	1,680	1	1,680	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		1		23		-		156		156		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	3	1	58	22	95	124	-	-	95	124	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	UBUS-Dsl	364	0	1,456	0	40,701	0	-	-	40,701	0	0.003	0.000	0.017	0.000	0.017	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.005	0.000	0.001	0.000	0.007	0.000	49.0	0.0
	UBUS-Elec	4	446	17	1,782	-	-	166	49,585	166	49,585	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.000	0.000	0.002	-	-	0.000	0.003	0.000	0.002	0.000	0.005	-	-
	UBUS-Gas	38	42	153	169	4,000	4,418	-	-	4,000	4,418	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.0	4.1
	UBUS-NG	35	0	141	0	4,026	0	-	-	4,026	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	5.4	0.0
Solano	All Other Buses-Dsl	71	95	635	849	3,866	4,265	-	-	3,866	4,265	0.001	0.000	0.010	0.004	0.010	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.0	4.9
	All Other Buses-NG	3	4	23	36	144	188	-	-	144	188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	LDA-Dsl	486	83	2,056	370	16,127	3,449	-	-	16,127	3,449	0.001	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.4	0.6
	LDA-Elec	4,756	17,857	23,821	83,294	-	-	228,868	803,966	228,868	803,966	-	-	-	-	-	-	-	-	0.000	0.001	0.001	0.002	0.001	0.003	-	-	0.001	0.004	0.002	0.007	0.003	0.011	-	-
	LDA-Gas	138,288	129,338	636,736	597,750	5,738,131	5,901,680	-	-	5,738,131	5,901,680	0.914	0.376	0.456	0.202	0.596	0.263	0.009	0.003	0.012	0.015	0.013	0.013	0.034	0.032	0.010	0.003	0.034	0.044	0.051	0.052	0.095	0.100	1,856.0	1,440.5
	LDA-Phe	3,093	6,077	12,788	25,128	80,008	113,744	76,726	165,437	156,735	279,181	0.006	0.015	0.002	0.004	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.004	23.3	35.5
	LDT1-Dsl	5	0	15	0	49	4	-	-	49	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	LDT1-Elec	19	239	85	1,115	-	-	679	10,694	679	10,694	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	13,402	7,645	58,520	34,608	456,057	310,852	-	-	456,057	310,852	0.181	0.028	0.092	0.012	0.121	0.015	0.001	0.000	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.000	0.003	0.003	0.004	0.003	0.009	0.006	174.9	87.5
	LDT1-Phe	8	182	32	753	188	3,212	220	4,684	409	7,897	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	1.0
	LDT2-Dsl	180	243	856	1,118	7,697	10,300	-	-	7,697	10,300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.8	2.6
	LDT2-Elec	192	2,571	982	12,018	-	-	7,355	80,394	7,355	80,394	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	LDT2-Gas	55,606	63,327	257,996	291,558	2,224,302	2,684,119	-	-	2,224,302	2,684,119	0.372	0.206	0.267	0.112	0.350	0.146	0.004	0.001	0.006	0.009	0.005	0.006	0.014	0.016	0.004	0.002	0.016	0.024	0.020	0.024	0.039	0.050	894.4	786.2
	LDT2-Phe	299	1,745	1,235	7,214	7,332	30,574	7,930	44,525	15,262	75,099	0.000	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	2.2	9.7
	LHD1-Dsl	4,628	1,781	58,217	22,401	173,368	69,307	-	-	173,368	69,307	0.045	0.007	0.453	0.019	0.483	0.020	0.010	0.001	0.005	0.002	0.001	0.000	0.016	0.004	0.010	0.001	0.015	0.006	0.002	0.001	0.027	0.008	121.9	45.8
	LHD1-Elec		3,456		48,386		-		165,689		165,689		-		-		-		-		0.002		0.000		0.003		-		0.007		0.001		0.009		-
	LHD1-Gas	5,353	2,558	79,745	38,106	203,226	104,041	-	-	203,226	104,041	0.090	0.021	0.102	0.017	0.122	0.020	0.000	0.000	0.006	0.003	0.000	0.000	0.007	0.003	0.000	0.000	0.017	0.009	0.002	0.001	0.020	0.010	203.5	85.5
	LHD2-Dsl	1,729	934	21,743	11,745	68,752	33,745	-	-	68,752	33,745	0.015	0.004	0.120	0.014	0.128	0.015	0.003	0.001	0.002	0.001	0.000	0.000	0.006	0.002	0.003	0.001	0.007	0.003	0.001	0.000	0.011	0.005	59.2	26.3
	LHD2-Elec		870		11,508		-		40,360		40,360		-		-		-		-		0.001		0.000		0.001		-		0.002		0.000		0.002		-
	LHD2-Gas	650	303	9,680	4,519	24,897	12,044	-	-	24,897	12,044	0.009	0.002	0.011	0.002	0.013	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.001	27.6	11.1
	MCY-Gas	8,347	6,573	16,694	13,146	47,547	40,217	-	-	47,547	40,217	0.307	0.193	0.034	0.018	0.043	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	9.3	7.5
	MDV-Dsl	639	416	2,995	1,875	26,120	16,629	-	-	26,120	16,629	0.000	0.000	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	12.4	5.5
	MDV-Elec	202	2,372	1,036	11,028	-	-	7,776	73,056	7,776	73,056	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	MDV-Gas	42,273	37,212	191,866	169,578	1,554,751	1,531,021	-	-	1,554,751	1,531,021	0.383	0.134	0.284	0.067	0.373	0.087	0.003	0.001	0.004	0.005	0.003	0.003	0.010	0.009	0.003	0.001	0.011	0.014	0.014	0.014	0.028	0.028	764.8	544.0
	MDV-Phe	209	1,118	863	4,624	5,318	19,161	5,286	27,896	10,604	47,057	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	1.6	6.1
	MH-Dsl	408	251	41	25	4,015	2,628	-	-	4,015	2,628	0.001	0.000	0.020	0.007	0.021	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.7	3.1
	MH-Gas	1,118	371	112	37	10,434	4,510	-	-	10,434	4,510	0.010	0.001	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	22.2	9.6
	Motor Coach-Dsl	46	59	1,053	1,366	6,530	7,488	-	-	6,530	7,488	0.000	0.000	0.017	0.010	0.018	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	13.2	13.0
	OBUS-Elec		28		569		-		2,513		2,513		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	156	45	3,120	894	10,151	1,989	-	-	10,151	1,989	0.003	0.001	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	20.0	3.4
	PTO-Dsl					4,868	3,360	-	-	4,868	3,360	0.000	0.000	0.016	0.009	0.017	0.009	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	11.2	6.3
	PTO-Elec					-	-	1	3,655	1	3,655	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	274	132	3,962	1,905	6,123	2,739	-	-	6,123	2,739	0.001	0.000	0.042	0.003	0.044	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.4	3.3
	SBUS-Elec		22		2,098		-		4,754	-	4,754	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	27	20	108	80	1,576	1,429	-	-	1,576	1,429	0.001	0.000	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.5	1.1
	SBUS-NG	6	7	84	98	148	142	-	-	148	142	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 CAIRP Class 4-Dsl	0	0	10	5	28	16	-	-	28	16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 4-Elec	0	0	0	8	-	-	0	24	0	24	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	1	0	13	6	38	22	-	-	38	22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP Class 5-Elec	0	0	0	9	-	-	0	33	0	33	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	2	1	41	29	101	56	-	-	101	56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 6-Elec	0	2	0	42	-	-	0	86	0	86	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	3	3	71	79	631	673	-	-	631	673	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.7
	T6 CAIRP Class 7-Elec	0	1	0	25	-	-	0	217	0	217	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	139	88	1,978	1,253	4,696	2,883	-	-	4,696	2,883	0.001	0.000	0.015	0.003	0.016	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.4	3.4
	T6 Instate Delivery Class 4-Elec	0	109	1	1,549	-	-	2	3,725	2	3,725	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	0	1	5	17	14	40	-	-	14	40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 5-Dsl	78	49	1,108	699	2,630	1,609	-	-	2,630	1,609	0.000	0.000	0.006	0.002	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.6	1.9
	T6 Instate Delivery Class 5-Elec	0	61	1	869	-	-	1	2,088	1	2,088	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	0	1	2	10	5	22	-	-	5	22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 6-Dsl	213	134	3,036	1,908	7,177	4,399	-	-	7,177	4,399	0.001	0.000	0.018	0.005	0.019	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	9.7	5.2
	T6 Instate Delivery Class 6-Elec	0	166	2	2,368	-	-	2	5,705	2	5,705	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	1	2	9	26	24	61	-	-	24	61	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 7-Dsl	38	34	548	479	2,102	1,701	-	-	2,102	1,701	0.000	0.000	0.004	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.8	2.0
	T6 Instate Delivery Class 7-Elec	0	24	0	349	-	-	0	1,291	0	1,291	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 7-NG	1	1	11	9	42	33	-	-	42	33	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Other Class 4-Dsl	236	156	2,733	1,799	9,674	5,800	-	-	9,674	5,800	0.001	0.000	0.024	0.005	0.025	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	12.7	6.7
	T6 Instate Other Class 4-Elec	0	193	0	2,226	-	-	1	7,801	1	7,801	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 4-NG	0	2	5	25	20	80	-	-	20	80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 5-Dsl	605	409	6,998	4,727	26,586	15,925	-	-	26,586	15,925	0.001	0.000	0.042	0.013	0.044	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	34.5	18.3
	T6 Instate Other Class 5-Elec	0	506	2	5,846	-	-	4	21,472	4	21,472	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 5-NG	2	6	17	64	66	219	-	-	66	219	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Instate Other Class 6-Dsl	428	283	4,946	3,269	18,371	11,005	-	-	18,371	11,005	0.001	0.000	0.036	0.009	0.038	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	24.1	12.7
	T6 Instate Other Class 6-Elec	0	350	3	4,046	-	-	5	14,826	5	14,826	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 6-NG	1	4	10	44	37	151	-	-	37	151	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.2
	T6 Instate Other Class 7-Dsl	196	177	2,263	2,044	9,044	6,963	-	-	9,044	6,963	0.000	0.000	0.016	0.008	0.017	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	11.6	8.1
	T6 Instate Other Class 7-Elec	0	119	0	1,376	-	-	0	5,941	0	5,941	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Other Class 7-NG	4	3	41	34	181	113	-	-	181	113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Instate Tractor Class 6-Dsl	3	2	39	25	168	100	-	-	168	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T6 Instate Tractor Class 6-Elec	0	3	0	32	-	-	0	137	0	137	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	0	1	1	-	-	1	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	54	66	627	762	3,159	3,619	-	-	3,159	3,619	0.000	0.000	0.005	0.003	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.0	3.8
	T6 Instate Tractor Class 7-Elec		14		167		-		899	-	899	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.000		0.000	-	0.000	-	-
	T6 Instate Tractor Class 7-NG	1	1	17	16	94	73	-	-	94	73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 OOS Class 4-Dsl	1	1	13	17	36	51	-	-	36	51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 OOS Class 5-Dsl	1	1	17	21	50	70	-	-	50	70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 6-Dsl	2	4	53	93	130	183	-	-	130	183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 OOS Class 7-Dsl	4	5	87	114	943	1,331	-	-	943	1,331	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	1.2
	T6 Public Class 4-Dsl	34	17	177	88	1,140	592	-	-	1,140	592	0.000	0.000	0.010	0.001	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	0.7
	T6 Public Class 4-Elec	0	18	0	90	-	-	0	669	0	669	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	0	1	1	3	12	19	-	-	12	19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 5-Dsl	67	36	342	185	2,384	1,249	-	-	2,384	1,249	0.000	0.000	0.013	0.001	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.5	1.6
	T6 Public Class 5-Elec	0	37	0	191	-	-	0	1,418	0	1,418	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	2	2	8	8	67	56	-	-	67	56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 6-Dsl	35	19	181	96	1,226	646	-	-	1,226	646	0.000	0.000	0.009	0.001	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	0.8
	T6 Public Class 6-Elec	0	20	0	100	-	-	0	741	0	741	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	1	1	7	6	58	38	-	-	58	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Public Class 7-Dsl	107	66	550	339	4,762	2,783	-	-	4,762	2,783	0.000	0.000	0.026	0.002	0.028	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.8	3.4
	T6 Public Class 7-Elec	0	53	0	272	-	-	1	2,467	1	2,467	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	2	4	9	19	103	154	-	-	103	154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Utility Class 5-Dsl	52	23	670	297	2,131	931	-	-	2,131	931	0.000	0.000	0.003	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.7	1.1
	T6 Utility Class 5-Elec		36		455		-		1,449		1,449		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	5	1	15	4	-	-	15	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	10	4	128	56	403	176	-	-	403	176	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.2
	T6 Utility Class 6-Elec		7		86		-		274		274		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	1	0	3	1	-	-	3	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	11	5	145	62	558	242	-	-	558	242	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.3
	T6 Utility Class 7-Elec	0	7	0	96	-	-	0	383	0	383	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	2	0	5	1	-	-	5	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		166		3,317		-		14,412		14,412		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.001		-
	T6TS-Gas	331	154	6,616	3,080	20,189	10,605	-	-	20,189	10,605	0.009	0.002	0.015	0.002	0.019	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	40.3	17.9
	T7 CAIRP Class 8-Dsl	813	1,035	18,689	23,791	165,898	211,196	-	-	165,898	211,196	0.012	0.015	0.435	0.396	0.468	0.426	0.006	0.007	0.005	0.007	0.002	0.002	0.012	0.015	0.006	0.007	0.014	0.019	0.007	0.008	0.026	0.034	305.3	317.7
	T7 CAIRP Class 8-Elec	2	286	41	6,573	-	-	186	60,423	186	60,423	-	-	-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-	0.000	0.003	0.000	0.002	0.000	0.005	-	-
	T7 CAIRP Class 8-NG	1	1	13	14	120	126	-	-	120	126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T7 NNOOS Class 8-Dsl	732	1,146	16,817	26,344	197,377	322,714	-	-	197,377	322,714	0.014	0.021	0.477	0.704	0.514	0.759	0.007	0.010	0.006	0.010	0.002	0.003	0.014	0.024	0.007	0.011	0.016	0.029	0.008	0.013	0.031	0.053	360.0	461.7
	T7 NOOS Class 8-Dsl	307	496	7,048	11,402	71,752	117,316	-	-	71,752	117,316	0.006	0.009	0.192	0.278	0.207	0.300	0.003	0.004	0.002	0.004	0.001	0.001	0.005	0.009	0.003	0.004	0.006	0.011	0.003	0.005	0.011	0.019	132.3	169.9
	T7 Other Port Class 8-Dsl	33	33	544	548	6,242	7,957	-	-	6,242	7,957	0.000	0.000	0.014	0.013	0.015	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	11.7	12.2
	T7 Other Port Class 8-Elec	0	8	0	126	-	-	2	2,004	2	2,004	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	197	237	3,224	3,878	19,821	27,349	-	-	19,821	27,349	0.001	0.001	0.055	0.052	0.058	0.055	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.002	0.003	0.001	0.001	0.003	0.004	37.8	42.6
	T7 POAK Class 8-Elec	0	55	2	906	-	-	5	6,317	5	6,317	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 POAK Class 8-NG	0	0	1	8	7	55	-	-	7	55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	201	131	1,030	672	8,773	5,286	-	-	8,773	5,286	0.001	0.000	0.087	0.013	0.091	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	18.8	9.6
	T7 Public Class 8-Elec	0	99	0	506	-	-	1	4,473	1	4,473	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Public Class 8-NG	1	1	5	5	50	40	-	-	50	40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 Single Concrete/Transit Mix Class 8-Dsl	13	6	125	59	848	395	-	-	848	395	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	0.6
	T7 Single Concrete/Transit Mix Class 8-Elec	0	9	0	83	-	-	0	587	0	587	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	1	0	6	4	44	24	-	-	44	24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T7 Single Dump Class 8-Dsl	132	88	1,246	832	8,027	4,432	-	-	8,027	4,432	0.000	0.000	0.021	0.008	0.022	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	15.5	7.5
	T7 Single Dump Class 8-Elec	0	82	0	769	-	-	0	4,889	0	4,889	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Dump Class 8-NG	7	5	67	48	466	253	-	-	466	253	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	0.3
	T7 Single Other Class 8-Dsl	245	231	2,311	2,175	14,271	11,164	-	-	14,271	11,164	0.001	0.001	0.034	0.021	0.036	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.002	27.1	18.8
	T7 Single Other Class 8-Elec	0	227	2	2,138	-	-	6	12,932	6	12,932	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.001	0.000	0.001	-	-
	T7 Single Other Class 8-NG	14	13	132	126	861	654	-	-	861	654	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.3	0.9
	T7 SWCV Class 8-Dsl	61	12	279	55	3,932	771	-	-	3,932	771	0.000	0.000	0.038	0.002	0.041	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	17.9	2.9
	T7 SWCV Class 8-Elec	0	56	0	259	-	-	0	3,645	0	3,645	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 SWCV Class 8-NG	49	54	227	248	3,197	3,501	-	-	3,197	3,501	0.000	0.000	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	5.7	5.1
	T7 Tractor Class 8-Dsl	1,138	2,010	16,542	29,201	90,611	125,985	-	-	90,611	125,985	0.006	0.010	0.278	0.326	0.294	0.345	0.002	0.003	0.003	0.004	0.001	0.001	0.006	0.008	0.002	0.003	0.008	0.012	0.004	0.005	0.014	0.020	165.8	188.8
	T7 Tractor Class 8-Elec	1	406	13	5,899	-	-	37	27,546	37	27,546	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Tractor Class 8-NG	91	110	1,326	1,594	7,449	6,861	-	-	7,449	6,861	0.000	0.000	0.006	0.004	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	10.9	9.4
	T7 Utility Class 8-Dsl	37	24	469	305	1,694	983	-	-	1,694	983	0.000	0.000	0.005	0.003	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.3	1.7
	T7 Utility Class 8-Elec	0	20	0	251	-	-	0	899	0	899	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		0		5		-		46		46		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	1	0	14	4	40	37	-	-	40	37	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	UBUS-Dsl	59	0	235	1	6,260	13	-	-	6,260	13	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	7.7	0.0
	UBUS-Elec	2	116	7	463	-	-	45	11,604	45	11,604	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	UBUS-Gas	34	21	134	83	1,615	1,121	-	-	1,615	1,121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	1.0
	UBUS-NG	39	0	156	0	4,491	5	-	-	4,491	5	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	6.0	0.0
Sonoma	All Other Buses-Dsl	110	149	975	1,328	6,619	7,368	-	-	6,619	7,368	0.001	0.000	0.012	0.006	0.013	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	8.6	8.3
	All Other Buses-NG	1	3	7	22	55	130	-	-	55	130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	LDA-Dsl	795	100	3,340	429	23,715	3,097	-	-	23,715	3,097	0.001	0.000	0.009	0.000	0.009	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.4	0.6
	LDA-Elec	5,708	19,464	28,341	89,951	-	-	263,133	751,491	263,133	751,491	-	-	-	-	-	-	-	-	0.000	0.001	0.001	0.002	0.001	0.003	-	-	0.001	0.004	0.002	0.007	0.004	0.010	-	-
	LDA-Gas	112,821	139,750	518,649	641,818	4,234,708	5,066,500	-	-	4,234,708	5,066,500	0.767	0.417	0.389	0.208	0.495	0.263	0.007	0.003	0.014	0.019	0.009	0.011	0.031	0.033	0.008	0.004	0.041	0.054	0.037	0.045	0.087	0.102	1,340.1	1,270.0
	LDA-Phe	2,601	6,596	10,754	27,275	60,779	98,806	58,760	143,645	119,538	242,451	0.005	0.017	0.002	0.004	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	19.6	34.3
	LDT1-Dsl	18	0	53	0	225	3	-	-	225	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	LDT1-Elec	26	237	122	1,099	-	-	1,001	9,239	1,001	9,239	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	LDT1-Gas	15,292	7,686	65,513	34,506	468,016	257,409	-	-	468,016	257,409	0.236	0.029	0.130	0.011	0.166	0.014	0.001	0.000	0.002	0.001	0.001	0.001	0.004	0.002	0.002	0.000	0.006	0.003	0.004	0.002	0.011	0.006	177.9	74.7
	LDT1-Phe	7	180	29	744	163	2,622	190	3,823	354	6,446	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.9
	LDT2-Dsl	241	246	1,129	1,120	9,233	8,515	-	-	9,233	8,515	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.3	2.3
	LDT2-Elec	175	2,539	897	11,832	-	-	6,606	69,449	6,606	69,449	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	LDT2-Gas	55,334	63,200	255,934	289,190	2,043,135	2,207,634	-	-	2,043,135	2,207,634	0.388	0.214	0.289	0.107	0.369	0.136	0.004	0.001	0.008	0.010	0.005	0.005	0.016	0.016	0.004	0.002	0.023	0.028	0.018	0.019	0.045	0.049	806.3	666.1
	LDT2-Phe	280	1,727	1,159	7,141	6,495	25,024	6,986	36,413	13,481	61,437	0.000	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	2.1	8.8
	LHD1-Dsl	6,856	2,005	86,235	25,216	245,252	64,641	-	-	245,252	64,641	0.066	0.007	0.711	0.021	0.746	0.022	0.014	0.001	0.007	0.002	0.001	0.000	0.023	0.004	0.015	0.001	0.021	0.006	0.003	0.001	0.039	0.008	173.6	43.2
	LHD1-Elec		3,408		47,728		-		142,786		142,786		-		-		-		-		0.002		0.000		0.002		-		0.006		0.001		0.007		-
	LHD1-Gas	6,741	2,714	100,431	40,431	241,043	93,610	-	-	241,043	93,610	0.126	0.024	0.140	0.019	0.163	0.022	0.001	0.000	0.007	0.003	0.001	0.000	0.008	0.003	0.001	0.000	0.021	0.008	0.002	0.001	0.023	0.009	245.1	77.5
	LHD2-Dsl	2,386	1,097	30,008	13,801	91,873	32,570	-	-	91,873	32,570	0.020	0.004	0.175	0.017	0.184	0.018	0.004	0.001	0.003	0.001	0.000	0.000	0.008	0.002	0.004	0.001	0.009	0.003	0.001	0.000	0.015	0.005	79.2	25.8
	LHD2-Elec		855		11,313		-		34,707		34,707		-		-		-		-		0.001		0.000		0.001		-		0.002		0.000		0.002		-
	LHD2-Gas	1,034	350	15,403	5,212	39,132	11,407	-	-	39,132	11,407	0.013	0.003	0.017	0.002	0.020	0.003	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.004	0.001	0.000	0.000	0.004	0.001	43.3	10.7
	MCY-Gas	8,169	6,733	16,338	13,465	44,176	35,061	-	-	44,176	35,061	0.296	0.196	0.033	0.018	0.040	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	8.5	6.7
	MDV-Dsl	833	435	3,887	1,925	31,603	14,070	-	-	31,603	14,070	0.001	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	14.8	5.1

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	MDV-Elec	183	2,351	939	10,888	-	-	6,940	63,234	6,940	63,234	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.001	0.000	0.001	-	-
	MDV-Gas	38,585	37,157	174,828	168,376	1,346,658	1,270,616	-	-	1,346,658	1,270,616	0.363	0.139	0.284	0.065	0.362	0.082	0.003	0.001	0.005	0.006	0.003	0.003	0.011	0.009	0.003	0.001	0.016	0.016	0.012	0.011	0.030	0.029	650.4	465.0
	MDV-Phe	193	1,110	799	4,590	4,516	15,859	4,464	23,073	8,980	38,932	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	1.5	5.6
	MH-Dsl	471	274	47	27	4,479	2,415	-	-	4,479	2,415	0.001	0.000	0.022	0.006	0.024	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	5.3	2.9
	MH-Gas	960	360	96	36	8,258	3,851	-	-	8,258	3,851	0.010	0.001	0.005	0.001	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	17.5	8.2
	Motor Coach-Dsl	24	38	553	873	3,428	4,788	-	-	3,428	4,788	0.000	0.000	0.009	0.006	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	7.0	8.3
	OBUS-Elec		28		556		-		1,677		1,677		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	OBUS-Gas	142	45	2,832	898	6,591	1,340	-	-	6,591	1,340	0.003	0.001	0.006	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.0	2.3
	PTO-Dsl					11,250	8,507	-	-	11,250	8,507	0.000	0.000	0.037	0.023	0.039	0.024	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	25.8	16.1
	PTO-Elec					-	-	4	9,170	4	9,170	-	-	-	-	-	-	-	-					-	-	-	-					-	-	-	-
	SBUS-Dsl	316	181	4,573	2,617	7,325	3,892	-	-	7,325	3,892	0.001	0.000	0.039	0.003	0.041	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.2	4.7
	SBUS-Elec		21		3,279		-		6,349	-	6,349	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	SBUS-Gas	47	20	190	80	2,458	996	-	-	2,458	996	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	0.8
	SBUS-NG	22	12	313	168	553	244	-	-	553	244	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	0.3
	T6 CAIRP Class 4-Dsl	1	1	29	17	85	51	-	-	85	51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 4-Elec	0	1	0	25	-	-	0	77	0	77	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 5-Dsl	2	1	40	21	117	70	-	-	117	70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 CAIRP Class 5-Elec	0	1	0	30	-	-	0	106	0	106	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 6-Dsl	5	4	124	95	305	183	-	-	305	183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	0.2
	T6 CAIRP Class 6-Elec	0	6	0	139	-	-	0	276	0	276	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 CAIRP Class 7-Dsl	9	11	215	262	1,911	2,184	-	-	1,911	2,184	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	2.1
	T6 CAIRP Class 7-Elec	0	4	0	81	-	-	1	696	1	696	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-Dsl	189	129	2,698	1,842	6,411	4,240	-	-	6,411	4,240	0.001	0.000	0.017	0.004	0.018	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.7	5.1
	T6 Instate Delivery Class 4-Elec	0	157	1	2,237	-	-	2	5,392	2	5,392	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 4-NG	0	2	7	25	19	57	-	-	19	57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 5-Dsl	106	74	1,509	1,050	3,655	2,414	-	-	3,655	2,414	0.000	0.000	0.008	0.002	0.008	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.0	2.9
	T6 Instate Delivery Class 5-Elec	0	89	1	1,276	-	-	1	3,072	1	3,072	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 5-NG	0	1	3	13	7	31	-	-	7	31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Delivery Class 6-Dsl	323	223	4,611	3,179	11,059	7,314	-	-	11,059	7,314	0.001	0.000	0.026	0.008	0.028	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	15.0	8.7
	T6 Instate Delivery Class 6-Elec	0	271	2	3,863	-	-	3	9,303	3	9,303	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 6-NG	1	3	13	42	33	97	-	-	33	97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Delivery Class 7-Dsl	87	84	1,248	1,196	4,790	4,223	-	-	4,790	4,223	0.000	0.000	0.010	0.005	0.010	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.3	5.1
	T6 Instate Delivery Class 7-Elec	0	58	0	821	-	-	0	3,032	0	3,032	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Delivery Class 7-NG	1	1	19	21	76	75	-	-	76	75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Instate Other Class 4-Dsl	449	309	5,193	3,568	18,386	11,884	-	-	18,386	11,884	0.002	0.000	0.048	0.010	0.050	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	23.9	13.7
	T6 Instate Other Class 4-Elec	0	373	1	4,311	-	-	2	15,728	2	15,728	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 4-NG	1	4	9	42	37	142	-	-	37	142	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T6 Instate Other Class 5-Dsl	1,196	888	13,831	10,260	53,029	34,205	-	-	53,029	34,205	0.001	0.000	0.080	0.028	0.084	0.029	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.002	0.001	0.000	0.004	0.002	69.2	39.4
	T6 Instate Other Class 5-Elec	0	1,075	4	12,424	-	-	8	45,381	8	45,381	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T6 Instate Other Class 5-NG	2	11	20	126	77	425	-	-	77	425	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	T6 Instate Other Class 6-Dsl	738	533	8,536	6,164	31,804	20,534	-	-	31,804	20,534	0.002	0.000	0.063	0.017	0.066	0.018	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.002	0.001	0.000	0.000	0.003	0.001	41.6	23.7
	T6 Instate Other Class 6-Elec	0	645	5	7,460	-	-	9	27,200	9	27,200	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 6-NG	1	7	12	76	45	256	-	-	45	256	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.3
	T6 Instate Other Class 7-Dsl	555	586	6,413	6,778	26,722	22,457	-	-	26,722	22,457	0.001	0.000	0.047	0.026	0.049	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	33.9	26.2
	T6 Instate Other Class 7-Elec	0	371	3	4,288	-	-	7	18,233	7	18,233	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T6 Instate Other Class 7-NG	10	10	115	118	535	381	-	-	535	381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.4
	T6 Instate Tractor Class 6-Dsl	5	3	58	40	242	155	-	-	242	155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.2
	T6 Instate Tractor Class 6-Elec	0	4	0	49	-	-	0	209	0	209	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 6-NG	0	0	0	1	1	2	-	-	1	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Instate Tractor Class 7-Dsl	168	226	1,944	2,614	10,421	12,716	-	-	10,421	12,716	0.000	0.000	0.018	0.011	0.019	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	12.3	13.2
	T6 Instate Tractor Class 7-Elec	0	47	0	542	-	-	1	3,069	1	3,069	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Instate Tractor Class 7-NG	3	4	33	43	195	208	-	-	195	208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2
	T6 OOS Class 4-Dsl	1	1	18	25	51	76	-	-	51	76	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 5-Dsl	1	1	24	31	69	104	-	-	69	104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 OOS Class 6-Dsl	3	6	75	142	181	273	-	-	181	273	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.3
	T6 OOS Class 7-Dsl	5	8	121	173	1,317	1,984	-	-	1,317	1,984	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.5	1.9
	T6 Public Class 4-Dsl	25	13	126	67	831	442	-	-	831	442	0.000	0.000	0.006	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	0.6
	T6 Public Class 4-Elec	0	13	0	66	-	-	0	486	0	486	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 4-NG	0	1	2	4	17	25	-	-	17	25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Public Class 5-Dsl	70	40	358	205	2,517	1,360	-	-	2,517	1,360	0.000	0.000	0.011	0.001	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.6	1.7
	T6 Public Class 5-Elec	0	39	0	201	-	-	0	1,485	0	1,485	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 5-NG	2	2	10	11	79	72	-	-	79	72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 6-Dsl	44	24	225	121	1,487	807	-	-	1,487	807	0.000	0.000	0.012	0.001	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	1.0
	T6 Public Class 6-Elec	0	23	0	120	-	-	1	882	1	882	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 6-NG	1	1	7	7	56	46	-	-	56	46	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Public Class 7-Dsl	85	55	438	281	3,756	2,271	-	-	3,756	2,271	0.000	0.000	0.027	0.002	0.028	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.4	2.8
	T6 Public Class 7-Elec	0	42	0	215	-	-	1	1,922	1	1,922	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Public Class 7-NG	2	3	8	16	91	132	-	-	91	132	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.2
	T6 Utility Class 5-Dsl	10	4	127	57	402	179	-	-	402	179	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.2
	T6 Utility Class 5-Elec		7		87		-		277		277		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 5-NG	0	0	2	0	5	1	-	-	5	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 6-Dsl	2	1	24	11	76	34	-	-	76	34	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 Utility Class 6-Elec		1		16		-		52		52		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6 Utility Class 6-NG	0	0	0	0	1	0	-	-	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 Utility Class 7-Dsl	2	1	27	12	105	47	-	-	105	47	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T6 Utility Class 7-Elec	0	1	0	18	-	-	0	73	0	73	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T6 Utility Class 7-NG	0	0	1	0	2	0	-	-	2	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6TS-Elec		177		3,547		-		10,438		10,438		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T6TS-Gas	541	196	10,830	3,916	26,629	8,303	-	-	26,629	8,303	0.015	0.003	0.022	0.003	0.026	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.001	53.4	14.1
	T7 CAIRP Class 8-Dsl	145	203	3,328	4,667	29,441	40,705	-	-	29,441	40,705	0.002	0.003	0.079	0.078	0.083	0.083	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.002	0.004	0.001	0.002	0.005	0.007	54.2	61.3
	T7 CAIRP Class 8-Elec	0	56	7	1,275	-	-	33	11,525	33	11,525	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 CAIRP Class 8-NG	0	0	4	5	38	44	-	-	38	44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 NNOOS Class 8-Dsl	130	223	2,989	5,135	34,979	61,957	-	-	34,979	61,957	0.002	0.004	0.086	0.138	0.091	0.147	0.001	0.002	0.001	0.002	0.000	0.001	0.003	0.005	0.001	0.002	0.003	0.006	0.001	0.002	0.005	0.010	63.8	88.7
	T7 NOOS Class 8-Dsl	54	97	1,251	2,221	12,709	22,511	-	-	12,709	22,511	0.001	0.002	0.035	0.055	0.037	0.058	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.001	0.002	0.001	0.001	0.002	0.004	23.5	32.6
	T7 Other Port Class 8-Dsl	13	16	215	264	2,469	3,832	-	-	2,469	3,832	0.000	0.000	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	4.6	5.9
	T7 Other Port Class 8-Elec	0	4	0	61	-	-	1	965	1	965	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POAK Class 8-Dsl	56	82	917	1,342	5,636	9,469	-	-	5,636	9,469	0.000	0.000	0.016	0.018	0.016	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	10.8	14.7
	T7 POAK Class 8-Elec	0	19	1	314	-	-	1	2,188	1	2,188	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-

County	Veh Tech	Population		Trips		C Vmt		E Vmt		Total VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T7 POAK Class 8-NG	0	0	0	3	2	21	-	-	2	21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Dsl	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 POLA Class 8-Elec	0	0	0	0	-	-	0	0	0	0	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 POLA Class 8-NG	0	0	0	0	0	0	-	-	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 Public Class 8-Dsl	255	169	1,310	869	10,789	6,754	-	-	10,789	6,754	0.002	0.000	0.124	0.018	0.129	0.019	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	23.3	12.3
	T7 Public Class 8-Elec	0	120	0	615	-	-	2	5,377	2	5,377	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.001	-	-
	T7 Public Class 8-NG	1	1	5	6	43	44	-	-	43	44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 Single Concrete/Transit Mix Class 8-Dsl	43	25	401	232	2,855	1,643	-	-	2,855	1,643	0.000	0.000	0.007	0.002	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.4	2.7
	T7 Single Concrete/Transit Mix Class 8-Elec	0	35	1	326	-	-	3	2,408	3	2,408	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Single Concrete/Transit Mix Class 8-NG	2	1	20	11	152	79	-	-	152	79	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.1
	T7 Single Dump Class 8-Dsl	389	324	3,668	3,055	24,154	16,259	-	-	24,154	16,259	0.001	0.001	0.059	0.031	0.063	0.033	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.004	0.003	46.8	27.5
	T7 Single Dump Class 8-Elec		299		2,812		-		17,842	-	17,842	-	-	-	-	-	-	-	-		0.000		0.000	-	0.000	-	-		0.001		0.001	-	0.002	-	-
	T7 Single Dump Class 8-NG	20	18	190	166	1,332	881	-	-	1,332	881	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	1.2
	T7 Single Other Class 8-Dsl	475	511	4,478	4,818	26,719	22,825	-	-	26,719	22,825	0.002	0.001	0.068	0.045	0.072	0.048	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.002	0.002	0.001	0.001	0.004	0.004	50.7	38.6
	T7 Single Other Class 8-Elec	0	492	4	4,632	-	-	15	25,931	15	25,931	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.001	-	0.000	0.001	0.000	0.001	0.000	0.002	-	-
	T7 Single Other Class 8-NG	24	26	226	240	1,445	1,156	-	-	1,445	1,156	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	1.6
	T7 SWCV Class 8-Dsl	89	10	410	44	5,785	619	-	-	5,785	619	0.000	0.000	0.055	0.003	0.057	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	26.0	2.6
	T7 SWCV Class 8-Elec	0	76	0	350	-	-	0	4,929	0	4,929	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	T7 SWCV Class 8-NG	62	84	285	387	4,012	5,461	-	-	4,012	5,461	0.000	0.000	0.007	0.001	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	6.9	8.0
	T7 Tractor Class 8-Dsl	210	417	3,045	6,055	16,619	25,301	-	-	16,619	25,301	0.001	0.002	0.052	0.068	0.054	0.071	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.001	0.002	0.001	0.001	0.003	0.004	30.4	38.0
	T7 Tractor Class 8-Elec	0	84	2	1,214	-	-	7	5,494	7	5,494	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7 Tractor Class 8-NG	21	27	306	397	1,694	1,654	-	-	1,694	1,654	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5	2.3
	T7 Utility Class 8-Dsl	7	5	90	61	321	194	-	-	321	194	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	0.3
	T7 Utility Class 8-Elec	0	4	0	47	-	-	0	167	0	167	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-
	T7IS-Elec		0		5		-		34		34		-		-		-		-		0.000		0.000		0.000		-		0.000		0.000		0.000		-
	T7IS-Gas	2	0	34	5	52	28	-	-	52	28	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	UBUS-Dsl	35	0	140	0	3,119	0	-	-	3,119	0	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	4.0	0.0
	UBUS-Elec	1	103	3	411	-	-	22	10,676	22	10,676	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.001	0.000	0.000	0.000	0.001	-	-
	UBUS-Gas	39	37	158	148	2,914	2,594	-	-	2,914	2,594	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.8	2.4
	UBUS-NG	37	0	146	0	4,558	0	-	-	4,558	0	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	7.0	0.0

EMFAC2017 Assumptions and Emissions by County and Veh Tech

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
Alameda	ALL OTHER BUSES - DSL	260	498	2,183	4,180	16,105	25,907	0.000	0.000	0.037	0.066	0.039	0.070	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.004	0.000	0.000	0.003	0.004	18.6	144.9
	LDA - DSL	6,251	9,343	29,119	43,576	225,904	281,959	0.003	0.002	0.019	0.003	0.020	0.003	0.002	0.000	0.004	0.005	0.000	0.001	0.006	0.006	0.002	0.000	0.009	0.011	0.002	0.002	0.013	0.014	50.5	199.8
	LDA - GAS	556,557	799,065	2,609,179	3,725,783	19,989,935	24,172,432	2.149	1.152	1.153	0.805	1.430	0.997	0.031	0.014	0.347	0.420	0.044	0.053	0.422	0.487	0.034	0.016	0.810	0.979	0.176	0.213	1.020	1.208	5,505.8	20,645.1
	LDT1 - DSL	32	11	102	49	514	320	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.4
	LDT1 - GAS	55,855	80,067	256,841	368,236	1,960,882	2,382,763	0.452	0.139	0.212	0.087	0.264	0.108	0.004	0.002	0.034	0.041	0.004	0.005	0.042	0.048	0.004	0.002	0.079	0.097	0.017	0.021	0.101	0.119	642.8	2,495.9
	LDT2 - DSL	1,180	2,393	5,742	11,109	48,299	72,851	0.001	0.001	0.002	0.002	0.002	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.001	0.003	0.004	14.4	70.8
	LDT2 - GAS	177,684	242,259	826,296	1,121,473	6,307,878	7,242,408	1.074	0.485	0.626	0.247	0.778	0.307	0.010	0.005	0.110	0.126	0.014	0.016	0.133	0.146	0.011	0.005	0.256	0.293	0.056	0.064	0.322	0.362	2,226.8	7,576.2
	LHD1 - DSL	8,235	14,628	103,590	184,000	319,379	456,929	0.056	0.065	0.527	0.051	0.554	0.051	0.008	0.004	0.012	0.017	0.001	0.002	0.020	0.022	0.008	0.004	0.027	0.039	0.004	0.006	0.039	0.048	188.8	971.1
	LHD1 - GAS	12,642	14,428	188,347	214,956	442,283	454,085	0.256	0.091	0.196	0.142	0.230	0.159	0.001	0.001	0.016	0.016	0.001	0.001	0.018	0.018	0.001	0.001	0.037	0.038	0.004	0.004	0.042	0.043	487.4	1,801.1
	LHD2 - DSL	3,120	5,991	39,247	75,364	120,290	179,607	0.020	0.026	0.163	0.024	0.171	0.025	0.003	0.003	0.005	0.008	0.000	0.001	0.008	0.012	0.003	0.004	0.012	0.018	0.002	0.002	0.016	0.024	79.9	433.2
	LHD2 - GAS	1,944	2,247	28,970	33,475	67,107	69,148	0.034	0.014	0.030	0.022	0.035	0.025	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	0.000	0.000	0.007	0.007	0.001	0.001	0.007	0.008	84.8	314.2
	MCY - GAS	24,320	34,262	48,640	68,523	184,654	215,631	0.889	1.062	0.221	0.257	0.272	0.313	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.002	0.003	0.001	0.001	0.004	0.005	37.3	208.7
	MDV - DSL	2,582	5,366	12,504	24,776	103,827	158,943	0.001	0.001	0.004	0.002	0.004	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	0.000	0.000	0.004	0.006	0.001	0.001	0.006	0.008	40.3	201.9
	MDV - GAS	108,763	155,822	501,342	717,625	3,730,546	4,525,909	0.767	0.382	0.464	0.165	0.577	0.204	0.006	0.003	0.065	0.079	0.008	0.010	0.079	0.091	0.007	0.003	0.151	0.183	0.033	0.040	0.191	0.226	1,588.2	5,772.6
	MH - DSL	624	1,164	62	116	6,342	9,446	0.001	0.001	0.026	0.024	0.027	0.026	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.002	6.9	37.9
	MH - GAS	1,832	2,372	183	237	17,968	21,518	0.002	0.001	0.006	0.005	0.007	0.006	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	33.9	145.4
	MOTOR COACH - DSL	67	101	975	1,475	9,412	12,528	0.001	0.001	0.026	0.032	0.027	0.034	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	16.0	90.8
	OBUS - GAS	464	426	9,288	8,525	22,495	18,304	0.008	0.005	0.014	0.012	0.017	0.015	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.004	0.003	43.7	128.2
	PTO - DSL					13,421	12,614	0.000	0.000	0.062	0.063	0.065	0.067	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	29.2	95.0
	SBUS - DSL	243	218	2,810	2,519	7,785	6,895	0.001	0.000	0.058	0.020	0.060	0.021	0.000	0.000	0.003	0.002	0.000	0.000	0.003	0.003	0.000	0.000	0.006	0.006	0.000	0.000	0.007	0.006	10.2	115.2
	SBUS - GAS	84	340	337	1,359	4,196	14,470	0.001	0.005	0.001	0.004	0.001	0.004	0.000	0.000	0.001	0.005	0.000	0.000	0.001	0.005	0.000	0.000	0.003	0.012	0.000	0.000	0.003	0.012	4.0	53.5
	T6 AG - DSL	3	0	13	0	27	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	43	70	634	1,018	8,471	11,266	0.000	0.000	0.010	0.013	0.010	0.013	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	8.1	30.6
	T6 CAIRP SMALL - DSL	23	39	336	567	1,203	1,614	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	435	628	1,965	2,839	28,618	42,551	0.001	0.001	0.080	0.122	0.085	0.128	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	0.000	0.001	0.004	0.006	0.000	0.001	0.005	0.007	37.3	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	837	1,425	3,784	6,442	46,944	69,800	0.001	0.001	0.114	0.176	0.120	0.184	0.000	0.001	0.003	0.004	0.000	0.000	0.003	0.005	0.000	0.001	0.007	0.010	0.001	0.001	0.008	0.012	60.8	257.2
	T6 INSTATE HEAVY - DSL	2,060	4,135	23,772	47,716	289,164	407,162	0.003	0.004	0.487	0.799	0.512	0.839	0.002	0.003	0.018	0.025	0.001	0.001	0.021	0.030	0.002	0.003	0.042	0.058	0.004	0.005	0.047	0.067	301.1	960.4
	T6 INSTATE SMALL - DSL	7,092	11,772	81,839	135,844	378,386	520,642	0.004	0.006	0.780	1.156	0.816	1.206	0.003	0.004	0.023	0.032	0.001	0.002	0.027	0.038	0.003	0.004	0.054	0.075	0.005	0.007	0.062	0.086	417.1	1,348.9
	T6 OOS HEAVY - DSL	25	40	364	581	4,867	6,477	0.000	0.000	0.005	0.007	0.006	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	4.6	18.0
	T6 OOS SMALL - DSL	13	23	193	329	688	921	0.000	0.000	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	2.8
	T6 PUBLIC - DSL	1,020	1,424	3,095	4,321	16,278	22,109	0.001	0.001	0.111	0.066	0.114	0.071	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.003	0.004	23.4	98.4
	T6 UTILITY - DSL	163	191	1,876	2,200	2,734	3,186	0.000	0.000	0.008	0.010	0.009	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	3.3	10.7
	T6TS - GAS	1,329	1,889	26,593	37,788	71,790	88,349	0.028	0.021	0.038	0.031	0.046	0.037	0.000	0.000	0.004	0.005	0.000	0.000	0.005	0.006	0.000	0.000	0.010	0.013	0.001	0.001	0.011	0.014	136.8	622.8
	T7 AG - DSL	2	0	7	0	12	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 CAIRP - DSL	1,473	1,730	21,501	25,262	267,984	356,589	0.024	0.029	0.908	1.060	0.968	1.131	0.009	0.011	0.008	0.010	0.003	0.004	0.019	0.025	0.009	0.011	0.018	0.024	0.011	0.014	0.038	0.050	425.5	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	113	177	510	800	20,557	30,565	0.001	0.002	0.097	0.137	0.102	0.145	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	37.9	105.3
	T7 NNOOS - DSL	1,653	2,703	24,137	39,457	326,687	434,669	0.032	0.050	1.002	1.392	1.073	1.494	0.009	0.011	0.010	0.013	0.003	0.004	0.022	0.028	0.009	0.012	0.022	0.030	0.013	0.017	0.044	0.059	494.0	1,298.5
	T7 NOOS - DSL	584	688	8,521	10,044	105,292	140,118	0.011	0.013	0.376	0.440	0.402	0.471	0.004	0.004	0.003	0.004	0.001	0.001	0.008	0.010	0.004	0.004	0.007	0.010	0.004	0.006	0.015	0.019	171.3	406.2
	T7 OTHER PORT - DSL	170	264	1,293	2,010	29,471	44,810	0.001	0.002	0.126	0.196	0.133	0.207	0.000	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.001	0.002	0.003	0.001	0.002	0.004	0.006	52.4	125.0
	T7 POAK - DSL	1,382	2,470	10,505	18,775	167,569	419,890	0.010	0.021	0.779	1.891	0.823	1.997	0.003	0.007	0.005	0.012	0.002	0.004	0.009	0.023	0.003	0.007	0.011	0.029	0.007	0.017	0.021	0.053	309.7	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	702	724	2,129	2,197	14,224	14,676	0.003	0.001	0.168	0.057	0.175	0.060	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.002	0.002	29.7	74.4
	T7 SINGLE - DSL	1,021	792	11,784	9,137	67,590	63,525	0.004	0.003	0.228	0.205	0.240	0.216	0.001	0.001	0.002	0.002	0.001	0.001	0.004	0.003	0.001	0.001	0.005	0.004	0.003	0.003	0.008	0.008	115.3	371.5
	T7 SINGLE CONSTRUCTION - DSL	735	995	3,322	4,497	50,997	75,826	0.004	0.004	0.222	0.303	0.234	0.320	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	0.001	0.001	0.003	0.005	0.002	0.003	0.007	0.009	99.3	272.0
	T7 SWCV - DSL	494	485	1,925	1,892	20,134	19,783	0.002	0.001	0.112	0.018	0.118	0.020	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.002	76.3	189.6
	T7 TRACTOR - DSL	3,495	5,446	44,387	69,168	482,963	674,570	0.018	0.025	1.207	1.514	1.274	1.598	0.014	0.019	0.014	0.020	0.005	0.007	0.033	0.045	0.015	0.020	0.033	0.046	0.019	0.027	0.067	0.093	684.2	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	618	849	2,792	3,839	42,068	62,550	0.003	0.004	0.225	0.313	0.237	0.331	0.001	0.001	0.001	0.002	0.000	0.001	0.003	0.004	0.001	0.002	0.003	0.004	0.002	0.002	0.006	0.008	82.3	221.8
	T7 UTILITY - DSL	104	122	1,193	1,398	2,105	2,464	0.000	0.000	0.009	0.011	0.009	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.9	7.3
	T7IS - GAS	7	7	137	147	771	821	0.000	0.000	0.002	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	6.1
	UBUS - DSL	557	556	2,228	2,224	64,692	64,315	0.001	0.002	0.081	0.049	0.081	0.049	0.000	0.000	0.002	0.002	0.001	0.001	0.003	0.003	0.000	0.000	0.005	0.005	0.002	0.002	0.008	0.008	116.2	396.5
	UBUS - GAS	17	7	68	28	1,298	415	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	17.9
Contra Costa	ALL OTHER BUSES - DSL	76	149	634	1,255	4,692	7,795	0.000	0.000	0.011	0.020	0.011	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	5.4	144.9
	LDA - DSL	3,438	5,461	16,113	25,488	129,833	170,923	0.002	0.001	0.009	0.001	0.009	0.002	0.001	0.000	0.002	0.003	0.000	0.000	0.003	0.003	0.001	0.000	0.005	0.007	0.001	0.002	0.007	0.009	28.5	199.8
	LDA - GAS	319,361	467,484	1,500,152	2,180,550	11,885,298	14,639,321	1.278	0.696	0.670	0.480	0.828	0.593	0.018	0.008	0.206	0.254	0.026	0.032	0.251	0.295	0.020	0.009	0.481	0.593	0.105	0.129	0.606	0.731	3,277.9	20,645.1
	LDT1 - DSL	18	6	58	28	299	190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	LDT1 - GAS	32,447	45,038	148,600	207,138	1,181,719	1,412,958	0.287	0.081	0.132	0.050	0.164	0.062	0.002	0.001	0.021	0.025	0.003	0.003	0.025	0.028	0.003	0.001	0.048	0.057	0.010	0.012	0.061	0.071	388.8	2,495.9
	LDT2 - DSL	721	1,349	3,511	6,258	30,590	43,260	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	9.2	70.8
	LDT2 - GAS	103,721	136,401	482,015	631,265	3,862,509	4,293,119	0.649	0.285	0.378	0.144	0.467	0.178	0.006	0.003	0.067	0.075	0.009	0.009	0.082	0.087	0.007	0.003	0.156	0.174	0.034	0.038	0.197	0.215	1,367.9	7,576.2

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
								2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050
		2023	2050	2023	2050	2023	2050	summer	summer	summer	summer	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	annual	annual
	LHD1 - DSL	6,450	8,297	81,129	104,370	236,201	262,772	0.045	0.037	0.509	0.030	0.534	0.030	0.007	0.002	0.009	0.009	0.001	0.001	0.016	0.013	0.007	0.002	0.020	0.022	0.003	0.003	0.030	0.028	142.8	971.1
	LHD1 - GAS	7,608	8,123	113,346	121,026	265,262	260,257	0.166	0.052	0.123	0.081	0.145	0.091	0.001	0.001	0.010	0.009	0.001	0.001	0.011	0.011	0.001	0.001	0.022	0.022	0.002	0.002	0.025	0.025	293.0	1,801.1
	LHD2 - DSL	2,219	3,424	27,915	43,063	82,822	103,640	0.014	0.015	0.134	0.016	0.141	0.016	0.002	0.002	0.003	0.004	0.000	0.000	0.006	0.007	0.002	0.002	0.008	0.010	0.001	0.001	0.012	0.014	56.0	433.2
	LHD2 - GAS	951	1,257	14,161	18,732	34,111	39,521	0.016	0.008	0.014	0.012	0.017	0.014	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.000	0.000	0.004	0.004	42.8	314.2
	MCY - GAS	15,048	19,416	30,097	38,833	113,004	123,974	0.571	0.620	0.136	0.147	0.167	0.179	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.002	0.003	22.6	208.7
	MDV - DSL	1,709	3,033	8,228	13,981	68,710	93,593	0.001	0.000	0.003	0.001	0.003	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.001	0.001	0.004	0.005	27.3	201.9
	MDV - GAS	73,348	88,144	335,137	405,150	2,550,507	2,665,076	0.563	0.232	0.356	0.096	0.441	0.119	0.004	0.002	0.044	0.046	0.006	0.006	0.054	0.054	0.005	0.002	0.103	0.108	0.022	0.024	0.130	0.133	1,118.3	5,772.6
	MH - DSL	590	673	59	67	5,370	5,486	0.001	0.000	0.025	0.014	0.027	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.001	6.0	37.9
	MH - GAS	1,424	1,340	142	134	12,958	12,349	0.002	0.000	0.005	0.003	0.006	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	24.8	145.4
	MOTOR COACH - DSL	21	31	304	451	2,939	3,831	0.000	0.000	0.008	0.010	0.009	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	5.0	90.8
	OBUS - GAS	222	230	4,444	4,595	10,590	10,434	0.004	0.002	0.008	0.007	0.009	0.008	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.002	20.5	128.2
	PTO - DSL					7,094	7,699	0.000	0.000	0.032	0.039	0.034	0.041	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	15.2	95.0
	SBUS - DSL	667	1,976	7,693	22,799	21,923	62,468	0.001	0.001	0.108	0.179	0.112	0.188	0.000	0.001	0.008	0.022	0.000	0.000	0.008	0.023	0.000	0.001	0.018	0.051	0.000	0.001	0.019	0.053	27.0	115.2
	SBUS - GAS	45	191	182	764	2,311	8,307	0.001	0.003	0.001	0.002	0.001	0.002	0.000	0.000	0.001	0.003	0.000	0.000	0.001	0.003	0.000	0.000	0.002	0.007	0.000	0.000	0.002	0.007	2.2	53.5
	T6 AG - DSL	7	1	29	5	61	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.0
	T6 CAIRP HEAVY - DSL	14	23	207	337	2,796	3,723	0.000	0.000	0.003	0.004	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	2.7	30.6
	T6 CAIRP SMALL - DSL	7	12	104	172	372	489	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	121	172	548	776	7,979	11,624	0.000	0.000	0.022	0.033	0.024	0.035	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	10.4	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	260	434	1,177	1,963	14,601	21,272	0.000	0.000	0.036	0.054	0.037	0.056	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.004	18.9	257.2
	T6 INSTATE HEAVY - DSL	503	766	5,806	8,840	64,044	73,680	0.001	0.001	0.117	0.147	0.123	0.154	0.000	0.001	0.004	0.005	0.000	0.000	0.005	0.005	0.001	0.001	0.009	0.011	0.001	0.001	0.011	0.012	68.5	960.4
	T6 INSTATE SMALL - DSL	1,976	2,212	22,808	25,525	96,875	97,433	0.001	0.001	0.212	0.217	0.221	0.226	0.001	0.001	0.006	0.006	0.000	0.000	0.007	0.007	0.001	0.001	0.014	0.014	0.001	0.001	0.016	0.016	108.4	1,348.9
	T6 OOS HEAVY - DSL	8	12	113	176	1,507	1,962	0.000	0.000	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	18.0
	T6 OOS SMALL - DSL	4	7	61	103	219	290	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	2.8
	T6 PUBLIC - DSL	501	667	1,518	2,022	7,930	10,349	0.001	0.000	0.055	0.031	0.057	0.033	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	11.5	98.4
	T6 UTILITY - DSL	51	58	582	668	848	967	0.000	0.000	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.0	10.7
	T6TS - GAS	606	1,057	12,119	21,150	34,362	50,721	0.013	0.012	0.018	0.018	0.022	0.021	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	0.000	0.000	0.005	0.007	0.000	0.001	0.005	0.008	64.5	622.8
	T7 AG - DSL	5	0	21	0	40	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 CAIRP - DSL	411	473	5,994	6,899	74,706	97,386	0.007	0.008	0.253	0.290	0.270	0.309	0.002	0.003	0.002	0.003	0.001	0.001	0.005	0.007	0.003	0.003	0.005	0.007	0.003	0.004	0.011	0.014	118.6	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	31	48	142	218	5,731	8,350	0.000	0.000	0.027	0.038	0.028	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	10.6	105.3
	T7 NNOOS - DSL	461	738	6,730	10,779	91,083	118,742	0.009	0.014	0.280	0.381	0.299	0.408	0.002	0.003	0.003	0.003	0.001	0.001	0.006	0.008	0.003	0.003	0.006	0.008	0.004	0.005	0.012	0.016	137.7	1,298.5
	T7 NOOS - DSL	163	188	2,375	2,743	29,350	38,260	0.003	0.004	0.105	0.120	0.112	0.129	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.002	0.003	0.001	0.002	0.004	0.005	47.8	406.2
	T7 OTHER PORT - DSL	47	72	359	548	8,197	12,208	0.000	0.001	0.035	0.054	0.037	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	14.6	125.0
	T7 POAK - DSL	385	674	2,928	5,121	46,698	114,524	0.003	0.006	0.217	0.516	0.229	0.545	0.001	0.002	0.001	0.003	0.000	0.001	0.003	0.006	0.001	0.002	0.003	0.008	0.002	0.005	0.006	0.014	86.3	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	347	346	1,054	1,050	7,042	7,012	0.002	0.001	0.090	0.028	0.094	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	15.0	74.4
	T7 SINGLE - DSL	559	484	6,450	5,584	35,726	38,776	0.002	0.002	0.120	0.125	0.126	0.131	0.000	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.001	0.002	0.003	0.001	0.002	0.004	0.005	60.2	371.5
	T7 SINGLE CONSTRUCTION - DSL	205	272	926	1,228	14,218	20,714	0.001	0.001	0.062	0.083	0.065	0.087	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.003	27.7	272.0
	T7 SWCV - DSL	275	159	1,074	621	11,241	6,498	0.001	0.000	0.067	0.008	0.070	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	44.6	189.6
	T7 TRACTOR - DSL	973	1,487	12,355	18,883	134,448	184,158	0.005	0.007	0.336	0.414	0.355	0.436	0.004	0.005	0.004	0.005	0.001	0.002	0.009	0.012	0.004	0.005	0.009	0.013	0.005	0.007	0.019	0.025	190.5	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	172	232	778	1,049	11,729	17,087	0.001	0.001	0.063	0.086	0.066	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.002	23.0	221.8
	T7 UTILITY - DSL	29	33	332	379	585	669	0.000	0.000	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	7.3
	T7IS - GAS	2	4	38	82	245	472	0.000	0.000	0.001	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	6.1
	UBUS - DSL	179	172	717	689	17,743	17,052	0.000	0.000	0.037	0.013	0.037	0.013	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.001	0.002	0.002	32.6	396.5
	UBUS - GAS	19	18	76	73	1,851	1,779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.1	17.9
Marin	ALL OTHER BUSES - DSL	22	57	184	479	1,436	3,049	0.000	0.000	0.003	0.008	0.003	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	144.9
	LDA - DSL	1,471	1,426	6,776	6,656	46,396	38,626	0.001	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.002	10.9	199.8
	LDA - GAS	88,028	120,896	414,100	565,673	2,944,558	3,323,166	0.343	0.169	0.182	0.114	0.224	0.140	0.005	0.002	0.051	0.058	0.006	0.007	0.062	0.067	0.005	0.002	0.119	0.135	0.026	0.029	0.150	0.166	808.0	20,645.1
	LDT1 - DSL	6	2	20	9	74	49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.4
	LDT1 - GAS	10,216	13,951	46,780	63,823	326,326	368,588	0.084	0.024	0.037	0.014	0.046	0.018	0.001	0.000	0.006	0.006	0.001	0.001	0.007	0.007	0.001	0.000	0.013	0.015	0.003	0.003	0.017	0.018	108.2	2,495.9
	LDT2 - DSL	372	422	1,779	1,936	13,090	11,218	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	4.3	70.8
	LDT2 - GAS	33,445	41,934	155,546	193,137	1,096,330	1,111,693	0.199	0.085	0.109	0.041	0.135	0.050	0.002	0.001	0.019	0.019	0.002	0.002	0.023	0.022	0.002	0.001	0.044	0.045	0.010	0.010	0.056	0.056	391.5	7,576.2
	LHD1 - DSL	1,796	2,580	22,593	32,449	66,519	76,850	0.012	0.011	0.131	0.009	0.138	0.009	0.002	0.001	0.002	0.003	0.000	0.000	0.004	0.004	0.002	0.001	0.006	0.006	0.001	0.001	0.008	0.008	39.9	971.1
	LHD1 - GAS	2,220	2,494	33,077	37,164	77,204	75,392	0.051	0.016	0.036	0.024	0.042	0.027	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	0.000	0.000	0.007	0.006	0.001	0.001	0.007	0.007	85.0	1,801.1
	LHD2 - DSL	585	1,059	7,353	13,319	22,587	30,279	0.004	0.004	0.029	0.004	0.030	0.004	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.002	0.003	0.000	0.000	0.003	0.004	15.1	433.2
	LHD2 - GAS	304	391	4,527	5,831	10,710	11,562	0.005	0.002	0.005	0.004	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	13.4	314.2
	MCY - GAS	4,598	6,035	9,197	12,069	33,367	34,944	0.167	0.172	0.041	0.042	0.050	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	6.8	208.7
	MDV - DSL	758	947	3,606	4,324	25,739	24,342	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	10.9	201.9
	MDV - GAS	19,638	27,003	90,851	123,727	624,795	691,747	0.129	0.066	0.076	0.027	0.094	0.033	0.001	0.000	0.011	0.012	0.001	0.002	0.013	0.014	0.001	0.000	0.025	0.028	0.006	0.006	0.032	0.035	269.6	5,772.6
	MH - DSL	147	212	15	21	1,417	1,618	0.000	0.000	0.006	0.004	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	37.9
	MH - GAS	325	414	32	41	3,175	3,590	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	6.0	145.4

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	MOTOR COACH - DSL	7	12	107	176	1,036	1,498	0.000	0.000	0.003	0.004	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	90.8
	OBUS - GAS	82	75	1,635	1,504	4,076	2,985	0.001	0.001	0.002	0.002	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	7.9	128.2
	PTO - DSL					920	1,225	0.000	0.000	0.004	0.006	0.004	0.006	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	2.0	95.0
	SBUS - DSL	97	115	1,120	1,330	3,039	3,643	0.000	0.000	0.033	0.010	0.035	0.011	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.003	0.003	4.2	115.2
	SBUS - GAS	23	60	92	242	1,129	2,450	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	1.1	53.5
	T6 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	3	6	48	81	631	894	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	30.6
	T6 CAIRP SMALL - DSL	1	0	9	0	26	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	13	21	60	94	869	1,406	0.000	0.000	0.002	0.004	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	67	124	303	561	3,756	6,078	0.000	0.000	0.009	0.015	0.010	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	4.9	257.2
	T6 INSTATE HEAVY - DSL	113	210	1,300	2,419	14,378	20,351	0.000	0.000	0.026	0.040	0.028	0.042	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	15.4	960.4
	T6 INSTATE SMALL - DSL	449	610	5,185	7,034	22,441	26,885	0.000	0.000	0.049	0.060	0.051	0.062	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.000	0.000	0.004	0.004	25.0	1,348.9
	T6 OOS HEAVY - DSL	2	4	30	53	402	589	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	18.0
	T6 OOS SMALL - DSL	1	2	17	33	61	93	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	2.8
	T6 PUBLIC - DSL	201	302	608	915	3,196	4,681	0.000	0.000	0.021	0.014	0.022	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	4.6	98.4
	T6 UTILITY - DSL	13	16	149	189	217	274	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	10.7
	T6TS - GAS	221	330	4,422	6,593	11,624	14,613	0.005	0.004	0.007	0.005	0.008	0.006	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	22.1	622.8
	T7 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 CAIRP - DSL	45	57	652	834	8,129	11,768	0.001	0.001	0.028	0.035	0.029	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	12.9	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	3	6	15	26	624	1,010	0.000	0.000	0.003	0.005	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	105.3
	T7 NNOOS - DSL	50	89	733	1,304	9,919	14,365	0.001	0.002	0.030	0.046	0.033	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	15.0	1,298.5
	T7 NOOS - DSL	18	23	258	330	3,187	4,604	0.000	0.000	0.011	0.014	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	5.2	406.2
	T7 OTHER PORT - DSL	5	8	38	58	841	1,304	0.000	0.000	0.004	0.006	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.5	125.0
	T7 POAK - DSL	42	81	318	616	5,076	13,786	0.000	0.001	0.024	0.062	0.025	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.002	9.4	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	146	251	441	761	2,945	5,086	0.001	0.000	0.029	0.019	0.031	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	5.9	74.4
	T7 SINGLE - DSL	72	77	834	887	4,633	6,169	0.000	0.000	0.016	0.020	0.016	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	7.9	371.5
	T7 SINGLE CONSTRUCTION - DSL	22	33	101	149	1,549	2,506	0.000	0.000	0.007	0.010	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.0	272.0
	T7 SWCV - DSL	70	44	273	173	2,857	1,806	0.000	0.000	0.024	0.002	0.025	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.6	189.6
	T7 TRACTOR - DSL	106	179	1,342	2,277	14,609	22,207	0.001	0.001	0.037	0.050	0.039	0.053	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	0.001	0.001	0.002	0.003	20.7	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	19	28	85	127	1,277	2,067	0.000	0.000	0.007	0.010	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5	221.8
	T7 UTILITY - DSL	3	4	35	44	62	78	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	7.3
	T7IS - GAS	2	1	31	26	198	136	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	6.1
	UBUS - DSL	45	48	180	192	2,049	2,188	0.000	0.000	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.2	396.5
	UBUS - GAS	23	25	93	99	2,150	2,296	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.1	17.9
Napa	ALL OTHER BUSES - DSL	65	89	546	749	3,770	4,398	0.000	0.000	0.009	0.012	0.009	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	4.4	144.9
	LDA - DSL	487	656	2,245	3,040	19,374	22,621	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	4.2	199.8
	LDA - GAS	37,677	55,922	176,447	259,433	1,531,790	1,929,587	0.153	0.082	0.088	0.061	0.111	0.077	0.002	0.001	0.027	0.034	0.003	0.004	0.032	0.039	0.003	0.001	0.062	0.078	0.014	0.017	0.078	0.096	414.3	20,645.1
	LDT1 - DSL	3	1	9	3	43	21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.4
	LDT1 - GAS	4,137	4,897	18,627	22,448	144,733	157,120	0.043	0.009	0.020	0.006	0.025	0.007	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	0.000	0.000	0.006	0.006	0.001	0.001	0.007	0.008	47.6	2,495.9
	LDT2 - DSL	96	147	460	678	3,925	4,798	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	70.8
	LDT2 - GAS	12,701	14,807	58,405	68,304	462,974	476,140	0.090	0.030	0.055	0.016	0.070	0.020	0.001	0.000	0.008	0.008	0.001	0.001	0.010	0.010	0.001	0.000	0.019	0.019	0.004	0.004	0.024	0.024	164.3	7,576.2
	LHD1 - DSL	1,273	923	16,018	11,609	43,262	30,526	0.009	0.004	0.130	0.004	0.137	0.004	0.002	0.000	0.002	0.001	0.000	0.000	0.003	0.001	0.002	0.000	0.004	0.003	0.001	0.000	0.006	0.003	27.0	971.1
	LHD1 - GAS	1,176	892	17,525	13,295	38,671	30,038	0.038	0.006	0.023	0.009	0.028	0.010	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.004	0.003	43.3	1,801.1
	LHD2 - DSL	430	395	5,414	4,972	15,111	12,266	0.003	0.002	0.035	0.003	0.037	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.002	10.5	433.2
	LHD2 - GAS	160	137	2,388	2,044	5,315	4,552	0.004	0.001	0.003	0.001	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	6.8	314.2
	MCY - GAS	1,941	2,154	3,882	4,308	15,352	15,468	0.073	0.068	0.018	0.018	0.023	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.0	208.7
	MDV - DSL	260	333	1,232	1,525	10,126	10,425	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	4.0	201.9
	MDV - GAS	9,647	9,615	43,450	43,985	322,305	296,405	0.081	0.024	0.051	0.011	0.064	0.013	0.001	0.000	0.006	0.005	0.001	0.001	0.007	0.006	0.001	0.000	0.013	0.012	0.003	0.003	0.016	0.015	141.7	5,772.6
	MH - DSL	84	76	8	8	753	642	0.000	0.000	0.004	0.002	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	37.9
	MH - GAS	230	147	23	15	1,992	1,423	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.9	145.4
	MOTOR COACH - DSL	10	16	148	232	1,432	1,968	0.000	0.000	0.004	0.005	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.4	90.8
	OBUS - GAS	51	29	1,029	588	2,903	1,340	0.001	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.7	128.2
	PTO - DSL					1,762	1,638	0.000	0.000	0.008	0.008	0.008	0.009	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	3.8	95.0
	SBUS - DSL	135	76	1,555	878	4,205	2,406	0.001	0.000	0.040	0.007	0.041	0.007	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.002	0.000	0.000	0.004	0.002	5.9	115.2
	SBUS - GAS	7	21	29	84	414	1,056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.4	53.5
	T6 AG - DSL	23	4	99	16	209	1	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	0.0
	T6 CAIRP HEAVY - DSL	3	6	49	83	656	922	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	30.6
	T6 CAIRP SMALL - DSL	1	0	8	0	23	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	20	30	91	136	1,326	2,043	0.000	0.000	0.004	0.006	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	110.7

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T6 INSTATE CONSTRUCTION SMALL - DSL	62	109	279	492	3,464	5,336	0.000	0.000	0.008	0.013	0.009	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	4.5	257.2
	T6 INSTATE HEAVY - DSL	143	146	1,654	1,681	16,819	13,168	0.000	0.000	0.032	0.027	0.034	0.029	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.002	18.3	960.4
	T6 INSTATE SMALL - DSL	446	382	5,152	4,411	21,040	16,763	0.000	0.000	0.048	0.037	0.050	0.039	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.003	0.002	0.000	0.000	0.003	0.003	23.8	1,348.9
	T6 OOS HEAVY - DSL	2	3	27	44	354	486	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	18.0
	T6 OOS SMALL - DSL	1	2	18	34	64	96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	2.8
	T6 PUBLIC - DSL	112	156	341	473	1,787	2,419	0.000	0.000	0.012	0.007	0.012	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.6	98.4
	T6 UTILITY - DSL	12	14	137	165	199	239	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	10.7
	T6TS - GAS	94	115	1,879	2,299	5,050	6,315	0.003	0.001	0.004	0.002	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	9.6	622.8
	T7 AG - DSL	7	5	30	23	52	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 CAIRP - DSL	68	83	995	1,211	12,401	17,087	0.001	0.001	0.042	0.051	0.045	0.054	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.002	0.002	19.7	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	5	8	24	38	952	1,467	0.000	0.000	0.004	0.007	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	105.3
	T7 NNOOS - DSL	77	130	1,118	1,894	15,135	20,864	0.001	0.002	0.046	0.067	0.050	0.072	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.003	22.9	1,298.5
	T7 NOOS - DSL	27	33	394	479	4,865	6,687	0.001	0.001	0.017	0.021	0.019	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	7.9	406.2
	T7 OTHER PORT - DSL	8	12	62	95	1,395	2,108	0.000	0.000	0.006	0.009	0.006	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5	125.0
	T7 POAK - DSL	64	116	485	883	7,723	19,750	0.000	0.001	0.036	0.089	0.038	0.094	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	14.3	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	108	149	328	452	2,191	3,019	0.000	0.000	0.025	0.012	0.026	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.5	74.4
	T7 SINGLE - DSL	142	104	1,634	1,195	8,875	8,251	0.001	0.000	0.030	0.027	0.031	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	14.9	371.5
	T7 SINGLE CONSTRUCTION - DSL	34	48	154	216	2,363	3,640	0.000	0.000	0.010	0.015	0.011	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.6	272.0
	T7 SWCV - DSL	52	37	204	143	2,131	1,493	0.000	0.000	0.024	0.002	0.025	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.2	189.6
	T7 TRACTOR - DSL	156	260	1,976	3,305	21,594	32,245	0.001	0.001	0.054	0.072	0.057	0.077	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	30.5	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	29	41	129	184	1,949	3,003	0.000	0.000	0.010	0.015	0.011	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.8	221.8
	T7 UTILITY - DSL	5	5	54	63	96	111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	7.3
	T7IS - GAS	0	0	9	9	55	59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	6.1
	UBUS - DSL	17	17	68	69	2,311	2,349	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.5	396.5
	UBUS - GAS	29	29	115	117	2,137	2,172	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.7	17.9
San Francisco	ALL OTHER BUSES - DSL	265	309	2,224	2,592	14,893	14,925	0.000	0.000	0.037	0.040	0.039	0.042	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	17.8	144.9
	LDA - DSL	1,773	2,078	8,275	9,791	58,972	58,977	0.001	0.000	0.004	0.001	0.004	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.003	0.003	13.9	199.8
	LDA - GAS	132,286	177,264	625,143	835,674	4,523,822	5,061,305	0.466	0.236	0.248	0.171	0.305	0.210	0.008	0.004	0.079	0.088	0.010	0.011	0.097	0.103	0.009	0.004	0.183	0.205	0.040	0.045	0.232	0.254	1,272.6	20,645.1
	LDT1 - DSL	9	3	31	13	132	68	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	LDT1 - GAS	14,241	20,887	66,403	96,002	430,029	510,390	0.084	0.035	0.038	0.021	0.047	0.026	0.001	0.000	0.007	0.009	0.001	0.001	0.009	0.010	0.001	0.000	0.017	0.021	0.004	0.005	0.022	0.026	145.3	2,495.9
	LDT2 - DSL	458	631	2,211	2,916	14,982	15,575	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	5.0	70.8
	LDT2 - GAS	44,323	63,070	208,402	291,972	1,352,564	1,548,635	0.224	0.120	0.122	0.061	0.150	0.075	0.003	0.001	0.023	0.027	0.003	0.003	0.029	0.032	0.003	0.001	0.055	0.063	0.012	0.014	0.070	0.078	487.3	7,576.2
	LHD1 - DSL	1,676	3,812	21,084	47,946	69,062	111,097	0.010	0.016	0.058	0.012	0.061	0.012	0.001	0.001	0.002	0.004	0.000	0.000	0.004	0.005	0.001	0.001	0.006	0.009	0.001	0.001	0.008	0.012	39.9	971.1
	LHD1 - GAS	3,387	3,795	50,466	56,540	117,640	110,846	0.050	0.024	0.045	0.036	0.052	0.040	0.000	0.000	0.004	0.004	0.000	0.000	0.005	0.005	0.000	0.000	0.010	0.009	0.001	0.001	0.011	0.011	129.5	1,801.1
	LHD2 - DSL	722	1,559	9,087	19,608	28,047	43,644	0.004	0.006	0.022	0.006	0.024	0.006	0.001	0.001	0.001	0.002	0.000	0.000	0.002	0.003	0.001	0.001	0.003	0.004	0.000	0.001	0.004	0.006	18.4	433.2
	LHD2 - GAS	421	585	6,276	8,711	14,640	16,800	0.006	0.004	0.006	0.005	0.007	0.006	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	18.3	314.2
	MCY - GAS	8,633	9,387	17,267	18,774	57,635	51,912	0.310	0.294	0.070	0.065	0.085	0.078	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	12.2	208.7
	MDV - DSL	744	1,402	3,605	6,466	27,003	37,326	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	11.2	201.9
	MDV - GAS	23,201	40,455	109,836	186,519	789,167	1,062,387	0.118	0.092	0.071	0.042	0.087	0.052	0.002	0.001	0.014	0.018	0.002	0.002	0.017	0.022	0.002	0.001	0.032	0.043	0.007	0.009	0.041	0.053	334.4	5,772.6
	MH - DSL	105	300	11	30	1,210	2,283	0.000	0.000	0.004	0.006	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.3	37.9
	MH - GAS	274	615	27	62	3,181	5,218	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	5.8	145.4
	MOTOR COACH - DSL	36	54	527	782	5,090	6,638	0.000	0.000	0.014	0.017	0.015	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	8.6	90.8
	OBUS - GAS	171	119	3,430	2,379	7,644	4,430	0.003	0.001	0.004	0.003	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	15.1	128.2
	PTO - DSL					2,062	2,710	0.000	0.000	0.009	0.013	0.010	0.014	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	4.4	95.0
	SBUS - DSL	99	189	1,148	2,181	3,235	5,972	0.000	0.000	0.017	0.017	0.018	0.018	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	0.000	0.000	0.003	0.005	0.000	0.000	0.003	0.005	4.1	115.2
	SBUS - GAS	103	89	411	356	4,779	3,477	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.004	0.003	0.000	0.000	0.004	0.003	4.8	53.5
	T6 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	19	31	282	447	3,773	4,949	0.000	0.000	0.004	0.006	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	3.6	30.6
	T6 CAIRP SMALL - DSL	11	19	160	274	575	780	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	10	14	46	66	674	982	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	366	611	1,657	2,763	20,553	29,934	0.000	0.001	0.050	0.075	0.053	0.079	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.000	0.000	0.003	0.005	26.6	257.2
	T6 INSTATE HEAVY - DSL	367	1,081	4,236	12,469	55,803	108,635	0.001	0.001	0.087	0.210	0.092	0.221	0.000	0.001	0.003	0.007	0.000	0.000	0.004	0.008	0.000	0.001	0.008	0.016	0.001	0.001	0.009	0.018	56.4	960.4
	T6 INSTATE SMALL - DSL	1,738	3,220	20,057	37,162	93,374	142,508	0.001	0.002	0.189	0.316	0.198	0.330	0.001	0.001	0.006	0.009	0.000	0.000	0.007	0.010	0.001	0.001	0.013	0.020	0.001	0.002	0.015	0.023	102.2	1,348.9
	T6 OOS HEAVY - DSL	11	17	158	246	2,108	2,739	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	18.0
	T6 OOS SMALL - DSL	6	9	82	134	291	377	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	2.8
	T6 PUBLIC - DSL	805	1,411	2,443	4,281	13,181	21,919	0.001	0.001	0.071	0.066	0.074	0.070	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.004	18.4	98.4
	T6 UTILITY - DSL	71	82	822	945	1,198	1,369	0.000	0.000	0.004	0.004	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	10.7
	T6TS - GAS	412	493	8,239	9,863	19,780	21,109	0.008	0.005	0.010	0.008	0.012	0.009	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	38.2	622.8
	T7 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	T7 CAIRP - DSL	35	40	505	578	6,289	8,163	0.001	0.001	0.021	0.024	0.023	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	10.0	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	3	4	12	18	484	705	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	105.3
	T7 NNOOS - DSL	39	62	568	910	7,694	10,028	0.001	0.001	0.024	0.032	0.025	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	11.6	1,298.5
	T7 NOOS - DSL	14	16	200	230	2,469	3,204	0.000	0.000	0.009	0.010	0.009	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.0	406.2
	T7 OTHER PORT - DSL	4	6	31	46	707	1,027	0.000	0.000	0.003	0.005	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.3	125.0
	T7 POAK - DSL	32	55	246	419	3,913	9,361	0.000	0.000	0.018	0.042	0.019	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	7.2	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	340	294	1,030	891	6,888	5,955	0.001	0.001	0.085	0.024	0.088	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	14.6	74.4
	T7 SINGLE - DSL	158	170	1,820	1,957	10,386	13,650	0.001	0.001	0.034	0.044	0.036	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	17.4	371.5
	T7 SINGLE CONSTRUCTION - DSL	17	23	78	104	1,201	1,750	0.000	0.000	0.005	0.007	0.006	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	272.0
	T7 SWCV - DSL	305	213	1,190	830	12,457	8,683	0.002	0.000	0.087	0.009	0.091	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	50.3	189.6
	T7 TRACTOR - DSL	82	125	1,044	1,590	11,359	15,502	0.000	0.001	0.028	0.035	0.030	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.002	16.1	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	15	20	66	89	991	1,443	0.000	0.000	0.005	0.007	0.006	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9	221.8
	T7 UTILITY - DSL	2	3	27	31	48	54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	7.3
	T7IS - GAS	1	2	25	38	98	196	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	6.1
	UBUS - DSL	564	542	2,255	2,167	51,349	49,336	0.001	0.002	0.043	0.039	0.043	0.039	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.004	0.004	0.002	0.002	0.006	0.006	94.6	396.5
	UBUS - GAS	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	17.9
San Mateo	ALL OTHER BUSES - DSL	459	623	3,859	5,232	27,871	31,337	0.000	0.000	0.066	0.084	0.069	0.088	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.004	0.005	0.000	0.000	0.005	0.005	32.7	144.9
	LDA - DSL	2,727	4,269	12,887	20,168	80,809	93,302	0.001	0.001	0.005	0.001	0.005	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.001	0.001	0.004	0.005	17.4	199.8
	LDA - GAS	248,321	365,390	1,180,272	1,725,213	7,386,914	8,019,285	0.829	0.478	0.422	0.305	0.518	0.373	0.011	0.005	0.128	0.139	0.016	0.018	0.156	0.162	0.012	0.006	0.299	0.325	0.065	0.071	0.377	0.401	1,987.2	20,645.1
	LDT1 - DSL	13	10	45	48	224	209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	LDT1 - GAS	36,880	77,634	175,313	356,910	1,093,822	1,560,774	0.184	0.126	0.091	0.072	0.112	0.088	0.002	0.001	0.019	0.027	0.002	0.003	0.024	0.032	0.002	0.001	0.044	0.063	0.010	0.014	0.056	0.078	343.1	2,495.9
	LDT2 - DSL	946	2,321	4,646	10,765	30,327	47,443	0.000	0.001	0.001	0.002	0.001	0.002	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	8.8	70.8
	LDT2 - GAS	117,893	234,100	563,511	1,084,237	3,491,966	4,723,857	0.497	0.428	0.285	0.204	0.350	0.250	0.006	0.003	0.061	0.082	0.008	0.010	0.074	0.096	0.006	0.004	0.141	0.191	0.031	0.042	0.179	0.237	1,160.2	7,576.2
	LHD1 - DSL	5,304	14,231	66,715	179,013	190,280	319,438	0.029	0.046	0.183	0.038	0.191	0.038	0.003	0.003	0.007	0.012	0.001	0.001	0.011	0.015	0.003	0.003	0.016	0.027	0.003	0.004	0.022	0.034	109.3	971.1
	LHD1 - GAS	7,635	13,906	113,751	207,175	247,852	316,141	0.108	0.084	0.089	0.117	0.103	0.130	0.001	0.001	0.009	0.011	0.001	0.001	0.010	0.013	0.001	0.001	0.021	0.027	0.002	0.003	0.024	0.030	268.1	1,801.1
	LHD2 - DSL	2,062	5,776	25,937	72,650	72,642	125,107	0.011	0.018	0.054	0.017	0.056	0.017	0.001	0.002	0.003	0.005	0.000	0.000	0.005	0.008	0.001	0.003	0.007	0.012	0.001	0.002	0.009	0.016	46.9	433.2
	LHD2 - GAS	1,076	2,174	16,031	32,396	34,576	48,211	0.014	0.013	0.013	0.018	0.015	0.021	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.005	0.000	0.000	0.004	0.005	42.6	314.2
	MCY - GAS	14,552	32,260	29,104	64,520	127,668	178,155	0.508	0.902	0.151	0.217	0.183	0.261	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.002	0.002	0.001	0.001	0.003	0.004	25.7	208.7
	MDV - DSL	2,082	5,212	10,193	24,036	68,543	106,821	0.001	0.001	0.002	0.001	0.002	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.001	0.001	0.004	0.005	25.9	201.9
	MDV - GAS	71,504	150,713	340,228	694,437	2,157,759	3,043,173	0.339	0.336	0.194	0.138	0.239	0.169	0.004	0.002	0.037	0.053	0.005	0.007	0.046	0.062	0.004	0.002	0.087	0.123	0.019	0.027	0.110	0.152	862.9	5,772.6
	MH - DSL	368	1,131	37	113	3,645	6,603	0.000	0.001	0.012	0.017	0.012	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	3.9	37.9
	MH - GAS	952	2,305	95	231	9,592	15,005	0.001	0.000	0.002	0.003	0.002	0.004	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	17.5	145.4
	MOTOR COACH - DSL	61	104	892	1,521	8,610	12,911	0.000	0.001	0.024	0.033	0.025	0.035	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	14.6	90.8
	OBUS - GAS	262	394	5,245	7,891	14,291	15,063	0.003	0.004	0.006	0.011	0.007	0.013	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	27.2	128.2
	PTO - DSL					2,984	2,390	0.000	0.000	0.014	0.012	0.014	0.013	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	6.5	95.0
	SBUS - DSL	154	122	1,775	1,410	4,813	3,862	0.001	0.000	0.050	0.011	0.052	0.012	0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.004	0.003	0.000	0.000	0.004	0.003	6.7	115.2
	SBUS - GAS	73	335	293	1,342	3,587	12,281	0.001	0.005	0.002	0.003	0.003	0.004	0.000	0.000	0.001	0.004	0.000	0.000	0.001	0.004	0.000	0.000	0.003	0.010	0.000	0.000	0.003	0.010	3.4	53.5
	T6 AG - DSL	3	0	14	0	31	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	17	29	248	428	3,273	4,739	0.000	0.000	0.004	0.005	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	3.1	30.6
	T6 CAIRP SMALL - DSL	11	22	162	328	588	934	0.000	0.000	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	18	30	83	136	1,214	2,032	0.000	0.000	0.003	0.006	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	353	677	1,596	3,059	19,804	33,140	0.000	0.001	0.048	0.083	0.051	0.087	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	0.000	0.000	0.003	0.005	0.000	0.000	0.003	0.006	25.6	257.2
	T6 INSTATE HEAVY - DSL	700	2,103	8,073	24,269	103,771	210,441	0.001	0.002	0.166	0.408	0.175	0.428	0.001	0.002	0.006	0.013	0.000	0.001	0.007	0.015	0.001	0.002	0.015	0.030	0.001	0.003	0.017	0.035	105.9	960.4
	T6 INSTATE SMALL - DSL	2,782	6,067	32,099	70,014	150,768	268,579	0.002	0.003	0.304	0.596	0.317	0.621	0.001	0.002	0.009	0.017	0.000	0.001	0.011	0.019	0.001	0.002	0.022	0.039	0.002	0.004	0.025	0.044	164.8	1,348.9
	T6 OOS HEAVY - DSL	11	19	155	280	2,076	3,122	0.000	0.000	0.002	0.004	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	2.0	18.0
	T6 OOS SMALL - DSL	5	10	78	146	277	410	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	2.8
	T6 PUBLIC - DSL	324	402	982	1,219	5,048	6,235	0.000	0.000	0.039	0.019	0.040	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	7.5	98.4
	T6 UTILITY - DSL	69	91	792	1,045	1,154	1,514	0.000	0.000	0.003	0.005	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	10.7
	T6TS - GAS	836	1,831	16,720	36,634	48,527	73,388	0.015	0.020	0.022	0.030	0.026	0.034	0.000	0.000	0.003	0.005	0.000	0.000	0.003	0.005	0.000	0.000	0.007	0.011	0.001	0.001	0.008	0.012	90.4	622.8
	T7 AG - DSL	3	0	12	0	52	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.1
	T7 CAIRP - DSL	62	82	911	1,203	11,353	16,982	0.001	0.001	0.038	0.050	0.041	0.054	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.002	0.002	18.0	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	5	8	22	38	872	1,459	0.000	0.000	0.004	0.007	0.004	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.6	105.3
	T7 NNOOS - DSL	70	129	1,024	1,884	13,857	20,751	0.001	0.002	0.043	0.066	0.045	0.071	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.003	21.0	1,298.5
	T7 NOOS - DSL	25	33	361	478	4,459	6,671	0.000	0.001	0.016	0.021	0.017	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	7.3	406.2
	T7 OTHER PORT - DSL	7	12	56	88	1,242	1,971	0.000	0.000	0.005	0.009	0.006	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.2	125.0
	T7 POAK - DSL	59	118	445	897	7,102	20,053	0.000	0.001	0.033	0.090	0.035	0.095	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.003	13.1	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	227	200	689	606	4,609	4,046	0.001	0.000	0.066	0.016	0.068	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	10.0	74.4
	T7 SINGLE - DSL	233	151	2,692	1,744	15,029	12,034	0.001	0.001	0.051	0.039	0.053	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.001	25.5	371.5

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
								2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050	2023	2050
		2023	2050	2023	2050	2023	2050	summer	summer	summer	summer	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	winter	annual	annual
	T7 SINGLE CONSTRUCTION - DSL	31	47	141	215	2,163	3,620	0.000	0.000	0.009	0.014	0.010	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.2	272.0
	T7 SWCV - DSL	231	230	901	899	9,425	9,397	0.001	0.000	0.059	0.010	0.061	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	38.2	189.6
	T7 TRACTOR - DSL	147	259	1,867	3,290	20,327	32,083	0.001	0.001	0.051	0.072	0.054	0.076	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	28.8	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	26	41	118	183	1,785	2,986	0.000	0.000	0.010	0.015	0.010	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.5	221.8
	T7 UTILITY - DSL	4	6	50	66	88	116	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	7.3
	T7IS - GAS	3	7	51	143	416	683	0.000	0.000	0.001	0.002	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	6.1
	UBUS - DSL	287	317	1,146	1,268	22,503	24,842	0.000	0.001	0.088	0.019	0.088	0.019	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.003	0.003	43.8	396.5
	UBUS - GAS	32	35	127	141	771	851	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	17.9
Santa Clara	ALL OTHER BUSES - DSL	537	687	4,508	5,769	32,762	34,546	0.000	0.000	0.077	0.092	0.081	0.096	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.005	0.005	0.000	0.000	0.005	0.006	38.3	144.9
	LDA - DSL	6,161	11,647	29,289	54,608	227,635	340,976	0.003	0.002	0.014	0.003	0.015	0.003	0.001	0.000	0.004	0.006	0.001	0.001	0.006	0.007	0.001	0.000	0.009	0.014	0.002	0.003	0.013	0.017	49.0	199.8
	LDA - GAS	632,543	997,773	2,985,758	4,674,115	22,539,879	29,194,849	2.260	1.414	1.253	0.996	1.524	1.212	0.035	0.018	0.391	0.507	0.050	0.064	0.476	0.590	0.038	0.020	0.913	1.183	0.199	0.257	1.150	1.460	6,126.4	20,645.1
	LDT1 - DSL	28	14	91	63	504	366	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.4
	LDT1 - GAS	61,926	102,044	287,422	469,974	2,034,168	2,731,798	0.452	0.176	0.221	0.107	0.271	0.130	0.004	0.002	0.035	0.047	0.004	0.006	0.044	0.055	0.005	0.002	0.082	0.111	0.018	0.024	0.105	0.137	659.1	2,495.9
	LDT2 - DSL	1,463	3,059	7,126	14,208	53,566	83,212	0.001	0.002	0.002	0.003	0.002	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.001	0.003	0.005	15.8	70.8
	LDT2 - GAS	208,949	309,248	974,598	1,433,121	6,811,394	8,286,406	1.221	0.616	0.716	0.305	0.873	0.371	0.011	0.006	0.118	0.144	0.015	0.018	0.144	0.168	0.012	0.006	0.276	0.336	0.060	0.073	0.348	0.415	2,394.2	7,576.2
	LHD1 - DSL	9,410	18,623	118,360	234,257	353,831	544,173	0.061	0.077	0.547	0.061	0.574	0.061	0.008	0.005	0.013	0.020	0.001	0.002	0.022	0.026	0.008	0.005	0.030	0.046	0.005	0.007	0.043	0.058	208.3	971.1
	LHD1 - GAS	13,435	18,273	200,164	272,235	456,201	539,683	0.265	0.113	0.201	0.174	0.233	0.193	0.001	0.001	0.016	0.019	0.001	0.001	0.019	0.022	0.001	0.001	0.038	0.045	0.004	0.005	0.044	0.052	500.1	1,801.1
	LHD2 - DSL	3,782	7,630	47,577	95,982	139,213	213,894	0.023	0.031	0.183	0.029	0.192	0.029	0.003	0.004	0.006	0.009	0.000	0.001	0.010	0.014	0.003	0.004	0.014	0.021	0.002	0.003	0.019	0.028	92.5	433.2
	LHD2 - GAS	1,854	2,845	27,628	42,380	63,258	82,138	0.033	0.017	0.027	0.027	0.032	0.031	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.004	0.000	0.000	0.006	0.008	0.001	0.001	0.007	0.009	79.1	314.2
	MCY - GAS	27,336	43,414	54,671	86,829	196,775	245,947	0.945	1.317	0.236	0.298	0.286	0.360	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.003	0.003	0.001	0.001	0.004	0.005	39.5	208.7
	MDV - DSL	3,250	6,860	15,752	31,688	115,421	181,811	0.001	0.001	0.004	0.002	0.004	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.003	0.004	0.001	0.000	0.005	0.007	0.001	0.002	0.006	0.009	44.6	201.9
	MDV - GAS	126,571	198,777	585,962	916,552	4,012,502	5,184,931	0.854	0.485	0.528	0.204	0.645	0.248	0.007	0.004	0.070	0.090	0.009	0.011	0.085	0.105	0.008	0.004	0.163	0.210	0.035	0.046	0.205	0.260	1,710.8	5,772.6
	MH - DSL	855	1,492	86	149	8,041	11,283	0.001	0.001	0.034	0.029	0.036	0.031	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.002	0.000	0.000	0.002	0.002	8.8	37.9
	MH - GAS	2,319	3,025	232	303	21,228	25,665	0.003	0.001	0.008	0.006	0.009	0.007	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	0.000	0.000	0.003	0.004	0.000	0.000	0.003	0.004	40.1	145.4
	MOTOR COACH - DSL	75	117	1,092	1,713	10,537	14,542	0.001	0.001	0.029	0.037	0.031	0.040	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.003	17.9	90.8
	OBUS - GAS	409	522	8,175	10,440	19,232	20,736	0.006	0.005	0.010	0.014	0.012	0.017	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	36.9	128.2
	PTO - DSL					11,319	9,357	0.000	0.000	0.053	0.047	0.055	0.050	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	24.8	95.0
	SBUS - DSL	823	667	9,493	7,692	25,884	21,065	0.003	0.000	0.229	0.061	0.237	0.064	0.001	0.000	0.009	0.007	0.000	0.000	0.010	0.008	0.001	0.000	0.021	0.017	0.000	0.000	0.023	0.018	35.4	115.2
	SBUS - GAS	214	431	855	1,726	9,713	16,377	0.004	0.007	0.005	0.004	0.006	0.005	0.000	0.000	0.003	0.006	0.000	0.000	0.003	0.006	0.000	0.000	0.008	0.013	0.000	0.000	0.008	0.014	9.7	53.5
	T6 AG - DSL	1	0	3	0	11	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	31	53	455	771	6,110	8,528	0.000	0.000	0.007	0.010	0.007	0.010	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	5.8	30.6
	T6 CAIRP SMALL - DSL	16	27	228	393	814	1,120	0.000	0.000	0.001	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	218	327	987	1,480	14,382	22,181	0.000	0.000	0.040	0.064	0.043	0.067	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.004	18.7	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	585	1,033	2,644	4,670	32,808	50,600	0.001	0.001	0.080	0.127	0.084	0.134	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.004	0.000	0.000	0.005	0.007	0.000	0.001	0.005	0.008	42.5	257.2
	T6 INSTATE HEAVY - DSL	1,063	2,130	12,262	24,576	143,317	208,614	0.001	0.002	0.249	0.411	0.261	0.432	0.001	0.002	0.009	0.013	0.000	0.001	0.010	0.015	0.001	0.002	0.021	0.030	0.002	0.003	0.024	0.034	150.5	960.4
	T6 INSTATE SMALL - DSL	4,736	6,174	54,650	71,248	238,739	272,360	0.003	0.003	0.515	0.607	0.538	0.633	0.002	0.002	0.015	0.017	0.001	0.001	0.017	0.020	0.002	0.002	0.034	0.039	0.003	0.004	0.039	0.045	266.2	1,348.9
	T6 OOS HEAVY - DSL	18	29	257	429	3,443	4,775	0.000	0.000	0.004	0.005	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	3.3	18.0
	T6 OOS SMALL - DSL	9	15	130	224	459	627	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	2.8
	T6 PUBLIC - DSL	727	902	2,207	2,736	11,427	13,994	0.001	0.000	0.086	0.042	0.088	0.045	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	16.8	98.4
	T6 UTILITY - DSL	114	139	1,312	1,598	1,913	2,315	0.000	0.000	0.006	0.007	0.006	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	10.7
	T6TS - GAS	1,224	2,397	24,481	47,959	63,558	100,695	0.025	0.026	0.033	0.039	0.039	0.045	0.000	0.000	0.004	0.006	0.000	0.000	0.004	0.007	0.000	0.000	0.009	0.014	0.001	0.001	0.010	0.016	119.2	622.8
	T7 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 CAIRP - DSL	740	902	10,805	13,168	134,668	185,875	0.012	0.015	0.457	0.553	0.487	0.590	0.004	0.006	0.004	0.005	0.001	0.002	0.010	0.013	0.005	0.006	0.009	0.013	0.005	0.007	0.019	0.026	213.8	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	57	92	256	417	10,331	15,933	0.001	0.001	0.049	0.072	0.051	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	19.0	105.3
	T7 NNOOS - DSL	831	1,409	12,130	20,568	164,173	226,586	0.016	0.026	0.504	0.727	0.540	0.779	0.004	0.006	0.005	0.007	0.002	0.002	0.011	0.015	0.005	0.006	0.011	0.015	0.007	0.009	0.022	0.031	248.3	1,298.5
	T7 NOOS - DSL	293	359	4,282	5,235	52,908	73,029	0.006	0.007	0.189	0.230	0.202	0.245	0.002	0.002	0.002	0.002	0.001	0.001	0.004	0.005	0.002	0.002	0.004	0.005	0.002	0.003	0.008	0.010	86.1	406.2
	T7 OTHER PORT - DSL	85	138	649	1,046	14,783	23,314	0.001	0.001	0.063	0.102	0.067	0.108	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.002	0.003	26.3	125.0
	T7 POAK - DSL	695	1,287	5,279	9,783	84,200	218,778	0.005	0.011	0.392	0.987	0.414	1.042	0.001	0.004	0.002	0.006	0.001	0.002	0.005	0.012	0.001	0.004	0.006	0.015	0.003	0.009	0.011	0.027	155.6	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	470	365	1,425	1,108	9,527	7,400	0.002	0.001	0.130	0.030	0.135	0.031	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.001	20.6	74.4
	T7 SINGLE - DSL	922	593	10,644	6,847	57,006	47,123	0.003	0.002	0.198	0.154	0.209	0.162	0.001	0.001	0.002	0.001	0.001	0.000	0.003	0.003	0.001	0.001	0.004	0.003	0.002	0.002	0.007	0.006	98.3	371.5
	T7 SINGLE CONSTRUCTION - DSL	369	518	1,670	2,344	25,628	39,527	0.002	0.002	0.112	0.158	0.118	0.167	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.002	0.003	0.001	0.002	0.003	0.005	49.9	272.0
	T7 SWCV - DSL	530	365	2,067	1,425	21,626	14,905	0.003	0.001	0.160	0.017	0.167	0.019	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.003	0.002	88.0	189.6
	T7 TRACTOR - DSL	1,757	2,839	22,309	36,051	242,734	351,588	0.009	0.013	0.608	0.790	0.641	0.834	0.007	0.010	0.007	0.010	0.002	0.003	0.017	0.024	0.007	0.010	0.017	0.024	0.010	0.014	0.034	0.048	343.9	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	310	443	1,403	2,001	21,141	32,606	0.002	0.002	0.113	0.164	0.119	0.172	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	41.4	221.8
	T7 UTILITY - DSL	52	63	598	724	1,055	1,277	0.000	0.000	0.005	0.005	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.0	7.3
	T7IS - GAS	4	9	78	187	449	935	0.000	0.000	0.001	0.003	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	6.1
	UBUS - DSL	428	436	1,712	1,742	47,747	48,582	0.001	0.001	0.039	0.038	0.039	0.038	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.004	0.004	0.002	0.002	0.006	0.006	81.8	396.5
	UBUS - GAS	7	7	27	28	861	876	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	17.9
Solano	ALL OTHER BUSES - DSL	110	299	922	2,510	7,701	16,344	0.000	0.000	0.016	0.041	0.017	0.043	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.003	8.6	144.9

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	LDA - DSL	1,685	2,683	7,933	12,505	70,115	93,440	0.001	0.000	0.005	0.001	0.006	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.001	0.000	0.003	0.004	0.001	0.001	0.004	0.005	15.8	199.8
	LDA - GAS	165,450	229,868	775,817	1,070,467	6,668,308	7,973,256	0.679	0.344	0.382	0.247	0.480	0.310	0.010	0.004	0.116	0.138	0.015	0.018	0.141	0.160	0.011	0.004	0.270	0.323	0.059	0.070	0.340	0.398	1,887.0	20,645.1
	LDT1 - DSL	11	3	40	13	223	90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	LDT1 - GAS	16,214	20,942	73,897	96,293	571,520	662,242	0.153	0.037	0.066	0.023	0.084	0.029	0.001	0.000	0.010	0.011	0.001	0.001	0.012	0.013	0.001	0.000	0.023	0.027	0.005	0.006	0.029	0.033	191.7	2,495.9
	LDT2 - DSL	295	621	1,442	2,886	12,475	20,136	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	3.7	70.8
	LDT2 - GAS	49,716	62,992	230,588	291,756	1,814,205	2,001,831	0.323	0.129	0.186	0.066	0.234	0.082	0.003	0.001	0.031	0.035	0.004	0.004	0.038	0.040	0.003	0.001	0.073	0.081	0.016	0.018	0.092	0.100	653.5	7,576.2
	LHD1 - DSL	4,238	3,883	53,304	48,847	148,557	128,387	0.030	0.018	0.392	0.015	0.418	0.015	0.005	0.001	0.005	0.005	0.000	0.000	0.011	0.006	0.005	0.001	0.013	0.011	0.002	0.002	0.020	0.014	91.2	971.1
	LHD1 - GAS	4,087	3,744	60,896	55,775	141,214	125,837	0.105	0.024	0.071	0.038	0.085	0.043	0.000	0.000	0.005	0.005	0.000	0.000	0.006	0.005	0.000	0.000	0.012	0.011	0.001	0.001	0.014	0.012	156.4	1,801.1
	LHD2 - DSL	1,492	1,640	18,763	20,626	54,143	51,190	0.010	0.007	0.101	0.009	0.107	0.009	0.002	0.001	0.002	0.002	0.000	0.000	0.004	0.003	0.002	0.001	0.005	0.005	0.001	0.001	0.008	0.007	37.3	433.2
	LHD2 - GAS	553	587	8,235	8,741	19,699	19,288	0.009	0.004	0.008	0.006	0.010	0.007	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.002	24.9	314.2
	MCY - GAS	8,944	9,190	17,887	18,379	80,045	71,920	0.377	0.308	0.096	0.082	0.122	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	16.0	208.7
	MDV - DSL	836	1,401	4,009	6,462	34,259	44,501	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	13.8	201.9
	MDV - GAS	38,975	40,808	176,892	187,526	1,313,234	1,267,270	0.312	0.107	0.179	0.044	0.225	0.055	0.002	0.001	0.023	0.022	0.003	0.003	0.028	0.025	0.002	0.001	0.053	0.051	0.012	0.011	0.067	0.063	583.8	5,772.6
	MH - DSL	404	321	40	32	3,543	2,708	0.001	0.000	0.019	0.007	0.020	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	4.0	37.9
	MH - GAS	1,048	630	105	63	9,059	6,049	0.001	0.000	0.004	0.001	0.005	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	17.7	145.4
	MOTOR COACH - DSL	49	69	721	1,005	6,955	8,531	0.000	0.000	0.019	0.022	0.020	0.023	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	11.8	90.8
	OBUS - GAS	137	112	2,739	2,235	8,126	6,111	0.002	0.001	0.004	0.004	0.005	0.005	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	15.9	128.2
	PTO - DSL					3,580	3,875	0.000	0.000	0.016	0.019	0.017	0.020	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	7.7	95.0
	SBUS - DSL	211	188	2,433	2,173	6,651	5,953	0.001	0.000	0.060	0.017	0.062	0.018	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.002	0.000	0.000	0.005	0.005	0.000	0.000	0.006	0.005	9.0	115.2
	SBUS - GAS	28	89	113	354	1,631	4,800	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.004	0.000	0.000	0.001	0.004	1.6	53.5
	T6 AG - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T6 CAIRP HEAVY - DSL	9	12	134	178	1,739	1,973	0.000	0.000	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.7	30.6
	T6 CAIRP SMALL - DSL	7	12	105	182	385	518	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	193	279	874	1,261	12,729	18,899	0.000	0.000	0.035	0.054	0.038	0.057	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	16.6	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	188	312	849	1,411	10,535	15,287	0.000	0.000	0.025	0.038	0.027	0.041	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.002	0.003	13.6	257.2
	T6 INSTATE HEAVY - DSL	284	365	3,274	4,208	35,147	34,421	0.000	0.000	0.064	0.069	0.068	0.073	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.003	0.000	0.000	0.005	0.005	0.000	0.000	0.006	0.006	37.6	960.4
	T6 INSTATE SMALL - DSL	1,048	1,029	12,093	11,871	51,184	45,267	0.001	0.001	0.112	0.101	0.117	0.105	0.000	0.000	0.003	0.003	0.000	0.000	0.004	0.003	0.000	0.000	0.007	0.007	0.001	0.001	0.008	0.007	57.3	1,348.9
	T6 OOS HEAVY - DSL	6	9	88	128	1,177	1,429	0.000	0.000	0.001	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.1	18.0
	T6 OOS SMALL - DSL	3	5	47	73	167	205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	2.8
	T6 PUBLIC - DSL	199	168	604	509	3,057	2,604	0.000	0.000	0.027	0.008	0.028	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	4.6	98.4
	T6 UTILITY - DSL	28	31	327	353	477	511	0.000	0.000	0.001	0.002	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.6	10.7
	T6TS - GAS	349	495	6,989	9,900	22,991	29,839	0.008	0.006	0.013	0.009	0.016	0.010	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.004	0.000	0.000	0.004	0.005	43.6	622.8
	T7 AG - DSL	0	0	1	0	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.1
	T7 CAIRP - DSL	760	824	11,101	12,029	138,357	169,795	0.012	0.014	0.465	0.501	0.502	0.541	0.005	0.005	0.004	0.005	0.001	0.002	0.010	0.012	0.005	0.005	0.009	0.012	0.005	0.007	0.020	0.024	219.7	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	50	79	227	355	9,143	13,575	0.000	0.001	0.043	0.060	0.046	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	16.9	105.3
	T7 NNOOS - DSL	854	1,287	12,464	18,796	168,701	207,062	0.016	0.024	0.514	0.659	0.557	0.715	0.005	0.005	0.005	0.006	0.002	0.002	0.011	0.014	0.005	0.006	0.011	0.014	0.007	0.008	0.023	0.028	255.1	1,298.5
	T7 NOOS - DSL	301	328	4,399	4,782	54,356	66,707	0.006	0.006	0.193	0.208	0.209	0.225	0.002	0.002	0.002	0.002	0.001	0.001	0.004	0.005	0.002	0.002	0.004	0.005	0.002	0.003	0.008	0.009	88.4	406.2
	T7 OTHER PORT - DSL	33	46	250	350	5,671	7,805	0.000	0.000	0.024	0.034	0.026	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	10.1	125.0
	T7 POAK - DSL	246	405	1,870	3,074	29,825	68,757	0.002	0.003	0.139	0.309	0.147	0.328	0.001	0.001	0.001	0.002	0.000	0.001	0.002	0.004	0.001	0.001	0.002	0.005	0.001	0.003	0.004	0.009	55.1	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	157	125	475	380	3,176	2,539	0.001	0.000	0.041	0.010	0.043	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	6.8	74.4
	T7 SINGLE - DSL	279	243	3,217	2,806	18,028	19,518	0.001	0.001	0.060	0.062	0.064	0.066	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.002	30.4	371.5
	T7 SINGLE CONSTRUCTION - DSL	327	442	1,478	1,997	22,683	33,678	0.002	0.002	0.098	0.133	0.105	0.143	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.002	0.002	0.001	0.001	0.003	0.004	44.2	272.0
	T7 SWCV - DSL	84	96	326	375	3,410	3,925	0.000	0.000	0.022	0.005	0.023	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.0	189.6
	T7 TRACTOR - DSL	1,083	1,505	13,753	19,113	149,078	186,321	0.005	0.007	0.372	0.416	0.397	0.443	0.004	0.005	0.004	0.005	0.001	0.002	0.010	0.013	0.005	0.005	0.010	0.013	0.006	0.007	0.021	0.026	211.5	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	275	377	1,242	1,705	18,711	27,781	0.001	0.002	0.099	0.138	0.106	0.148	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.004	36.6	221.8
	T7 UTILITY - DSL	32	34	364	390	643	688	0.000	0.000	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.2	7.3
	T7IS - GAS	2	2	41	39	303	277	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.7	6.1
	UBUS - DSL	94	85	375	340	10,567	9,564	0.000	0.000	0.010	0.007	0.010	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	17.1	396.5
	UBUS - GAS	28	25	112	101	2,338	2,113	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.9	17.9
Sonoma	ALL OTHER BUSES - DSL	145	235	1,217	1,971	9,078	12,158	0.000	0.000	0.021	0.032	0.022	0.033	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.002	10.5	144.9
	LDA - DSL	2,049	2,627	9,357	12,144	72,620	79,669	0.001	0.000	0.010	0.001	0.011	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.000	0.003	0.003	0.001	0.001	0.004	0.004	16.7	199.8
	LDA - GAS	143,076	223,563	669,966	1,034,906	5,322,839	6,820,414	0.595	0.337	0.341	0.239	0.421	0.295	0.009	0.004	0.092	0.118	0.012	0.015	0.113	0.138	0.010	0.004	0.216	0.276	0.047	0.060	0.272	0.341	1,466.2	20,645.1
	LDT1 - DSL	20	3	62	12	275	73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.1	0.4
	LDT1 - GAS	16,446	18,743	73,394	85,913	529,263	540,745	0.194	0.034	0.089	0.021	0.111	0.026	0.001	0.000	0.009	0.009	0.001	0.001	0.012	0.011	0.001	0.000	0.021	0.022	0.005	0.005	0.028	0.027	177.7	2,495.9
	LDT2 - DSL	324	558	1,556	2,585	12,627	16,422	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	3.9	70.8
	LDT2 - GAS	47,928	56,538	220,305	260,896	1,628,387	1,635,946	0.360	0.117	0.214	0.058	0.265	0.072	0.003	0.001	0.028	0.028	0.004	0.004	0.035	0.033	0.003	0.001	0.066	0.066	0.014	0.014	0.083	0.082	583.4	7,576.2
	LHD1 - DSL	5,796	3,573	72,906	44,944	192,252	111,804	0.043	0.016	0.612	0.015	0.642	0.015	0.007	0.001	0.007	0.004	0.001	0.000	0.015	0.005	0.008	0.001	0.016	0.009	0.003	0.001	0.026	0.012	120.6	971.1
	LHD1 - GAS	4,692	3,406	69,911	50,749	152,623	109,172	0.166	0.025	0.093	0.034	0.110	0.038	0.000	0.000	0.006	0.004	0.000	0.000	0.006	0.004	0.001	0.000	0.013	0.009	0.001	0.001	0.015	0.010	170.8	1,801.1
	LHD2 - DSL	1,801	1,535	22,650	19,314	63,025	45,042	0.012	0.007	0.137	0.009	0.144	0.010	0.002	0.001	0.003	0.002	0.000	0.000	0.005	0.003	0.002	0.001	0.006	0.004	0.001	0.001	0.009	0.006	44.1	433.2

County	Veh Tech	Population		Trips		VMT		Rog Total		NOx TOTEX		NOx TOTEX		Pm2 5 Totex		Pm2 5 Pmbw		Pm2 5 Pmtw		Pm2 5 Total		Pm10 Totex		Pm10 Pmbw		Pm10 Pmtw		Pm10 Total		Co2 Totex	
		2023	2050	2023	2050	2023	2050	2023 summer	2050 summer	2023 summer	2050 summer	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 winter	2050 winter	2023 annual	2050 annual
	LHD2 - GAS	709	533	10,558	7,935	23,784	16,694	0.015	0.004	0.012	0.005	0.014	0.006	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.003	0.002	30.5	314.2
	MCY - GAS	8,454	8,369	16,909	16,737	54,143	48,049	0.304	0.246	0.067	0.059	0.082	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	10.8	208.7
	MDV - DSL	913	1,267	4,336	5,811	34,426	36,635	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.002	14.0	201.9
	MDV - GAS	35,018	36,638	157,982	167,784	1,129,130	1,043,259	0.311	0.095	0.186	0.039	0.230	0.049	0.002	0.001	0.020	0.018	0.002	0.002	0.024	0.021	0.002	0.001	0.046	0.042	0.010	0.009	0.058	0.052	498.7	5,772.6
	MH - DSL	387	293	39	29	3,322	2,353	0.000	0.000	0.018	0.006	0.019	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	3.8	37.9
	MH - GAS	868	560	87	56	7,343	5,175	0.001	0.000	0.004	0.001	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	14.3	145.4
	MOTOR COACH - DSL	26	41	383	595	3,697	5,053	0.000	0.000	0.010	0.013	0.011	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	6.3	90.8
	OBUS - GAS	132	101	2,635	2,026	5,915	4,073	0.003	0.001	0.005	0.003	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	11.6	128.2
	PTO - DSL					9,743	17,092	0.000	0.000	0.046	0.085	0.048	0.089	0.000	0.000					0.000	0.000	0.000	0.000					0.000	0.000	20.5	95.0
	SBUS - DSL	374	239	4,320	2,756	11,821	7,546	0.001	0.000	0.086	0.022	0.089	0.023	0.000	0.000	0.004	0.003	0.000	0.000	0.005	0.003	0.000	0.000	0.010	0.006	0.000	0.000	0.010	0.006	16.1	115.2
	SBUS - GAS	52	80	207	321	2,423	3,276	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	2.4	53.5
	T6 AG - DSL	45	7	196	32	394	2	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.5	0.0
	T6 CAIRP HEAVY - DSL	16	26	234	373	3,101	4,127	0.000	0.000	0.004	0.005	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	3.0	30.6
	T6 CAIRP SMALL - DSL	8	13	117	190	414	542	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.4	5.0
	T6 INSTATE CONSTRUCTION HEAVY - DSL	27	36	124	162	1,801	2,430	0.000	0.000	0.005	0.007	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3	110.7
	T6 INSTATE CONSTRUCTION SMALL - DSL	245	391	1,106	1,766	13,718	19,137	0.000	0.000	0.034	0.048	0.035	0.051	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.003	0.000	0.000	0.002	0.003	17.8	257.2
	T6 INSTATE HEAVY - DSL	717	1,138	8,278	13,134	90,368	109,981	0.001	0.001	0.184	0.220	0.193	0.231	0.001	0.001	0.006	0.007	0.000	0.000	0.007	0.008	0.001	0.001	0.013	0.016	0.001	0.001	0.015	0.018	97.0	960.4
	T6 INSTATE SMALL - DSL	2,127	3,233	24,541	37,309	110,228	142,862	0.001	0.002	0.235	0.318	0.245	0.332	0.001	0.001	0.007	0.009	0.000	0.000	0.008	0.010	0.001	0.001	0.016	0.021	0.001	0.002	0.018	0.024	122.4	1,348.9
	T6 OOS HEAVY - DSL	10	16	142	232	1,896	2,583	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8	18.0
	T6 OOS SMALL - DSL	5	9	74	127	262	357	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.3	2.8
	T6 PUBLIC - DSL	257	306	780	928	4,026	4,745	0.000	0.000	0.030	0.014	0.031	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	6.0	98.4
	T6 UTILITY - DSL	46	56	533	641	776	928	0.000	0.000	0.002	0.003	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	10.7
	T6TS - GAS	374	495	7,489	9,906	17,663	21,869	0.012	0.007	0.015	0.008	0.018	0.009	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.003	0.003	0.000	0.000	0.003	0.003	33.9	622.8
	T7 AG - DSL	44	26	193	115	431	2	0.000	0.000	0.003	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.9	0.1
	T7 CAIRP - DSL	136	164	1,985	2,395	24,742	33,801	0.002	0.003	0.085	0.102	0.090	0.108	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.001	0.002	0.002	0.001	0.001	0.004	0.005	39.3	1,010.2
	T7 CAIRP CONSTRUCTION - DSL	7	10	32	46	1,294	1,746	0.000	0.000	0.006	0.008	0.006	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.4	105.3
	T7 NNOOS - DSL	153	257	2,231	3,750	30,199	41,311	0.003	0.005	0.094	0.133	0.100	0.143	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.002	0.003	0.001	0.002	0.004	0.006	45.7	1,298.5
	T7 NOOS - DSL	54	65	786	951	9,713	13,267	0.001	0.001	0.035	0.042	0.037	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	15.8	406.2
	T7 OTHER PORT - DSL	13	20	101	154	2,268	3,432	0.000	0.000	0.010	0.015	0.010	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.0	125.0
	T7 POAK - DSL	71	130	540	988	8,606	22,092	0.000	0.001	0.040	0.100	0.042	0.105	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.002	0.000	0.001	0.001	0.003	15.9	1,167.2
	T7 POLA - DSL	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
	T7 PUBLIC - DSL	191	92	580	280	3,881	1,870	0.001	0.000	0.064	0.008	0.066	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	8.7	74.4
	T7 SINGLE - DSL	709	1,065	8,180	12,289	49,065	86,081	0.003	0.004	0.172	0.273	0.180	0.288	0.001	0.001	0.001	0.003	0.000	0.001	0.003	0.005	0.001	0.001	0.003	0.006	0.002	0.003	0.006	0.011	80.9	371.5
	T7 SINGLE CONSTRUCTION - DSL	46	57	209	257	3,209	4,331	0.000	0.000	0.014	0.017	0.015	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	6.3	272.0
	T7 SWCV - DSL	109	126	424	492	4,438	5,145	0.000	0.000	0.044	0.005	0.045	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	18.5	189.6
	T7 TRACTOR - DSL	193	319	2,451	4,048	26,373	39,489	0.001	0.001	0.070	0.089	0.073	0.094	0.001	0.001	0.001	0.001	0.000	0.000	0.002	0.003	0.001	0.001	0.002	0.003	0.001	0.002	0.004	0.005	37.4	1,554.5
	T7 TRACTOR CONSTRUCTION - DSL	39	49	176	219	2,647	3,573	0.000	0.000	0.014	0.018	0.015	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.2	221.8
	T7 UTILITY - DSL	6	7	71	83	125	146	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	7.3
	T7IS - GAS	4	2	78	39	369	203	0.000	0.000	0.002	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.8	6.1
	UBUS - DSL	75	76	300	303	8,086	8,155	0.000	0.000	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	15.0	396.5
	UBUS - GAS	8	8	30	30	588	593	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4	17.9

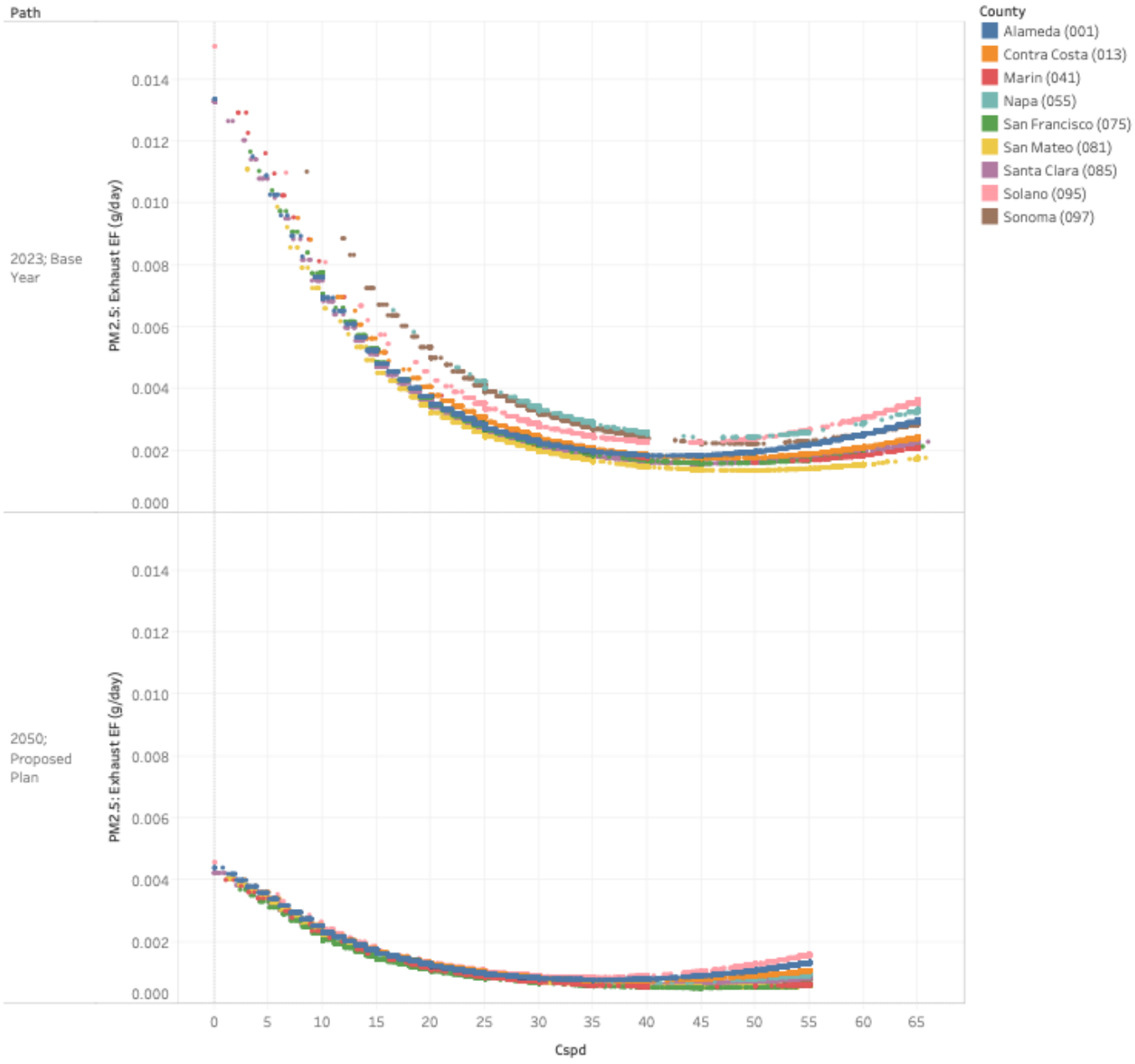
EMFAC2021 Overburdened Communities Emissions by County and Status

Year	County	Overburdened Status	Emissions (kg/day): PM2.5-Exhaust	Emissions (kg/day): Diesel PM	Emissions (kg/day): Benzene	Emissions (kg/day): 1,3 Butadiene	Emissions (kg/day): PM2.5-Break & Tire	Emissions (kg/day): PM2.5-Entrained	Emissions (kg/day): Total
2023; Base Year	Alameda	Overburdened Communities	17.3	9.6	6.2	0.5	52.0	111.1	196.8
		Remainder of County	64.9	36.8	22.4	2.0	184.0	389.4	699.4
	Contra Costa	Overburdened Communities	15.4	7.9	6.2	0.6	45.7	89.2	165.0
		Remainder of County	26.1	13.0	11.0	1.0	77.5	174.6	303.1
	Marin	Overburdened Communities	1.0	0.5	0.5	0.0	2.9	5.4	10.3
		Remainder of County	9.2	4.2	4.3	0.4	26.7	55.6	100.4
	Napa	Overburdened Communities	0.1	0.0	0.0	0.0	0.2	0.5	0.7
		Remainder of County	6.8	4.3	2.5	0.2	17.7	44.2	75.7
	San Francisco	Overburdened Communities	3.7	1.5	1.8	0.2	12.1	22.6	40.9
		Remainder of County	13.6	5.4	6.6	0.7	42.2	88.8	157.2
	San Mateo	Overburdened Communities	4.8	1.7	2.1	0.2	16.7	35.3	60.8
		Remainder of County	16.5	5.9	7.1	0.6	70.1	154.1	221.9
	Santa Clara	Overburdened Communities	9.3	4.3	3.9	0.3	31.3	65.6	111.8
		Remainder of County	56.2	24.9	24.7	2.1	196.6	440.2	706.8
	Solano	Overburdened Communities	7.8	5.1	2.5	0.2	18.1	44.1	77.8
		Remainder of County	26.4	18.1	7.7	0.7	57.7	118.5	229.1
	Sonoma	Overburdened Communities	2.9	1.9	1.3	0.1	7.6	13.7	27.6
		Remainder of County	20.5	14.0	9.4	0.8	56.3	126.2	227.3
2050; Proposed Plan	Alameda	Overburdened Communities	10.7	6.8	3.0	0.3	67.3	160.0	248.1
		Remainder of County	35.2	23.0	9.6	0.9	229.6	540.7	839.0
	Contra Costa	Overburdened Communities	8.3	3.6	2.3	0.2	53.0	116.6	184.0
		Remainder of County	13.5	5.4	4.3	0.4	87.9	222.5	334.0
	Marin	Overburdened Communities	0.4	0.2	0.2	0.0	3.0	6.3	10.1
		Remainder of County	3.3	1.4	1.5	0.2	28.2	67.4	102.0
	Napa	Overburdened Communities	0.0	0.0	0.0	0.0	0.2	0.6	0.8
		Remainder of County	2.2	1.3	0.7	0.1	17.9	49.3	71.5
	San Francisco	Overburdened Communities	1.8	0.6	0.9	0.1	14.8	33.6	51.8
		Remainder of County	5.6	1.8	3.1	0.3	44.5	107.7	163.0
	San Mateo	Overburdened Communities	2.8	1.1	1.5	0.2	22.5	54.9	82.9
		Remainder of County	10.8	4.1	6.0	0.6	86.6	225.0	333.1
	Santa Clara	Overburdened Communities	4.9	2.5	1.9	0.2	38.4	88.7	136.5
		Remainder of County	34.5	16.1	14.2	1.4	257.8	652.5	976.5
	Solano	Overburdened Communities	3.8	2.8	0.8	0.1	21.5	56.9	85.9
		Remainder of County	12.6	9.9	2.2	0.2	67.5	149.2	241.6
	Sonoma	Overburdened Communities	0.9	0.5	0.3	0.0	7.2	15.1	24.0
		Remainder of County	6.6	3.1	2.7	0.3	57.1	147.4	217.2

EMFAC2017 Overburdened Communities Emissions by County and Status

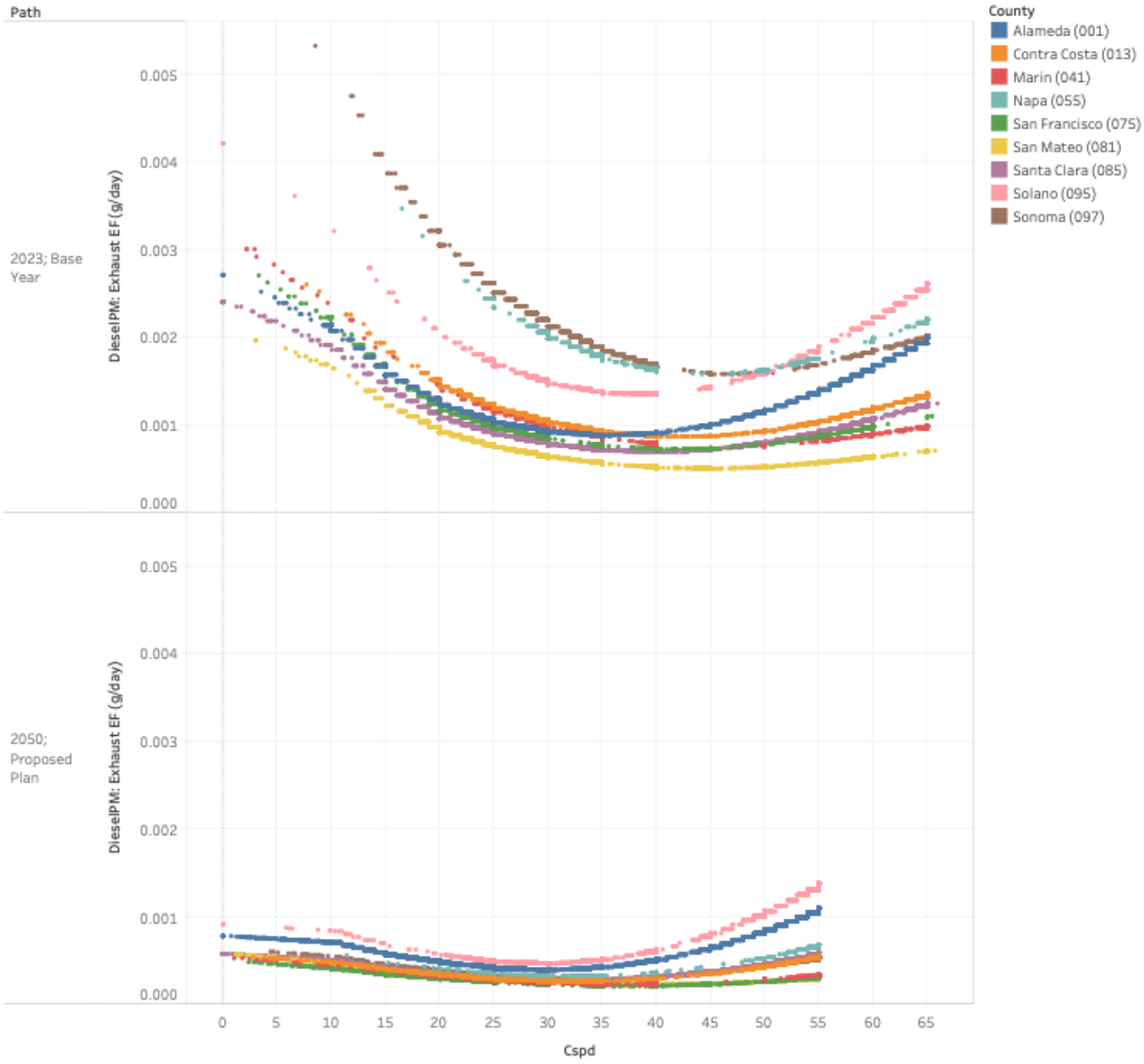
Year	County	Overburdened Status	Emissions (kg/day): PM2.5-Exhaust	Emissions (kg/day): Diesel PM	Emissions (kg/day): Benzene	Emissions (kg/day): 1,3 Butadiene	Emissions (kg/day): PM2.5-Break & Tire	Emissions (kg/day): PM2.5-Entrained	Emissions (kg/day): Total
2023; Base Year	Alameda	Overburdened Communities	17.4	9.4	5.3	1.2	147.9	110.9	291.9
		Remainder of County	65.5	36.7	18.9	4.2	523.2	388.8	1,037.4
	Contra Costa	Overburdened Communities	14.2	6.6	5.0	1.1	134.9	85.6	247.5
		Remainder of County	23.7	10.3	8.8	2.0	228.7	167.5	441.0
	Marin	Overburdened Communities	0.9	0.4	0.4	0.1	9.2	5.2	16.2
		Remainder of County	8.4	3.4	3.6	0.8	85.1	53.6	154.9
	Napa	Overburdened Communities	0.0	0.0	0.0	0.0	0.4	0.4	0.9
		Remainder of County	5.6	3.1	1.9	0.4	46.9	41.5	99.3
	San Francisco	Overburdened Communities	3.1	0.9	1.6	0.4	32.7	22.0	59.1
		Remainder of County	11.5	3.3	6.0	1.3	113.7	86.4	222.1
	San Mateo	Overburdened Communities	4.6	1.5	2.4	0.6	54.0	35.1	98.2
		Remainder of County	15.8	5.0	8.4	1.9	226.8	153.1	350.9
	Santa Clara	Overburdened Communities	8.9	3.8	3.2	0.7	93.8	63.9	169.1
		Remainder of County	53.6	21.3	20.2	4.5	588.7	429.2	1,049.9
	Solano	Overburdened Communities	5.0	4.5	2.2	0.5	51.6	42.8	106.6
		Remainder of County	16.6	16.6	7.0	1.6	164.8	114.9	321.5
	Sonoma	Overburdened Communities	2.6	1.4	0.9	0.2	19.7	12.9	37.7
		Remainder of County	18.1	9.4	6.7	1.5	145.5	118.2	299.3
2050; PBA 2050+	Alameda	Overburdened Communities	13.7	9.6	4.8	1.1	185.7	151.1	365.9
		Remainder of County	45.8	32.9	15.1	3.3	633.7	510.5	1,241.3
	Contra Costa	Overburdened Communities	8.5	5.2	3.5	0.8	165.9	108.9	292.8
		Remainder of County	13.7	7.8	6.4	1.4	275.0	207.9	512.2
	Marin	Overburdened Communities	0.5	0.3	0.3	0.1	10.0	5.9	17.1
		Remainder of County	4.1	2.1	2.4	0.5	93.4	63.2	165.7
	Napa	Overburdened Communities	0.0	0.0	0.0	0.0	0.5	0.5	1.1
		Remainder of County	2.9	1.9	1.1	0.2	52.1	46.5	104.8
	San Francisco	Overburdened Communities	2.2	1.0	1.5	0.3	42.9	31.9	79.7
		Remainder of County	6.9	3.0	4.7	1.1	128.9	102.1	246.7
	San Mateo	Overburdened Communities	3.6	1.8	3.2	0.7	73.7	52.3	135.4
		Remainder of County	14.1	7.0	12.5	2.8	284.2	214.3	535.0
	Santa Clara	Overburdened Communities	5.9	3.3	2.8	0.6	113.5	81.3	207.4
		Remainder of County	41.3	21.5	20.8	4.6	762.1	598.1	1,448.5
	Solano	Overburdened Communities	3.0	3.2	1.4	0.3	59.9	51.4	119.2
		Remainder of County	9.2	11.3	3.8	0.9	188.0	134.8	348.0
	Sonoma	Overburdened Communities	1.1	0.7	0.4	0.1	20.8	14.0	37.2
		Remainder of County	8.2	4.5	3.6	0.8	166.0	136.9	320.0

Emission Rates (2017)



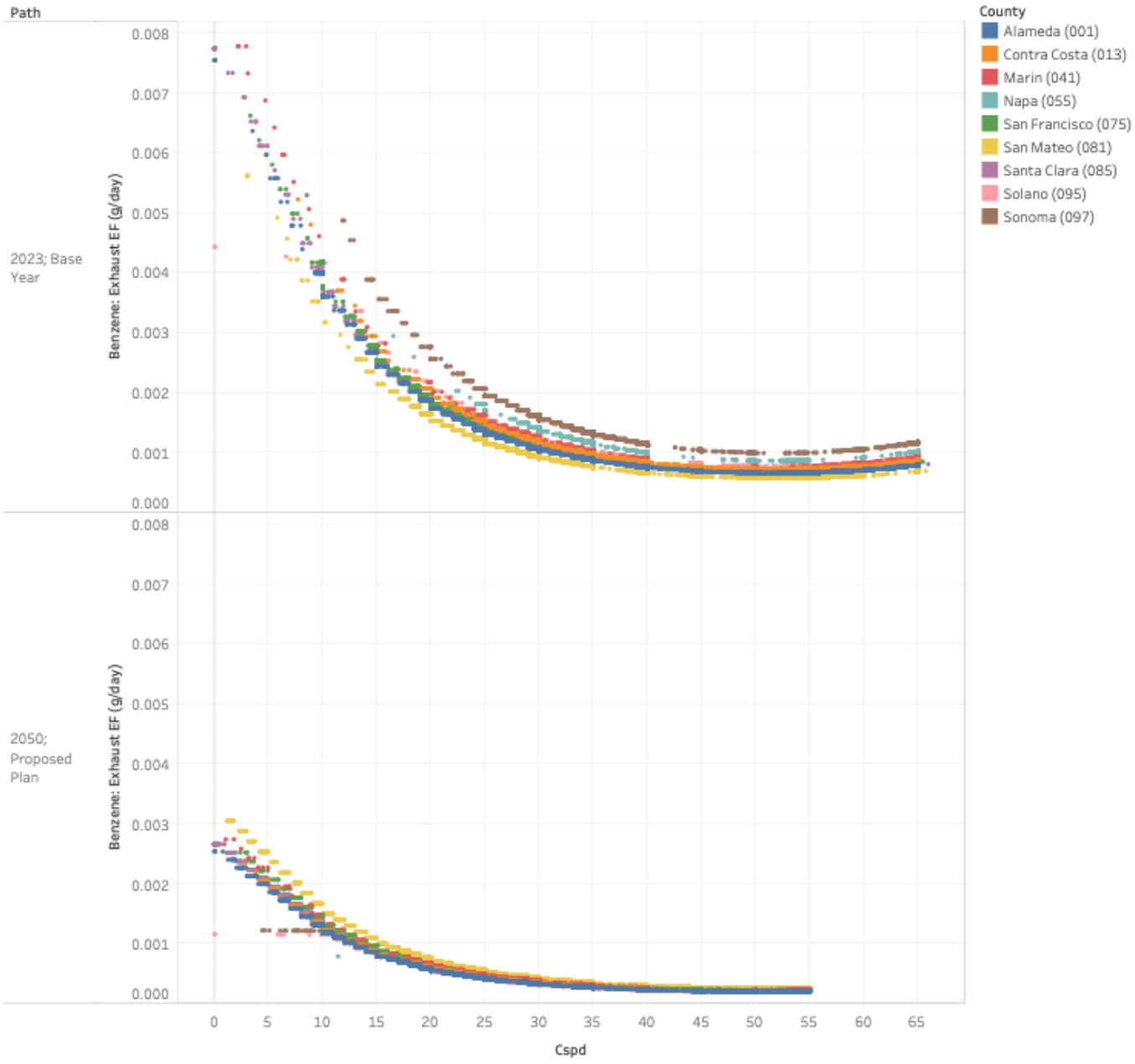
Cspd vs. PM2.5: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2017)



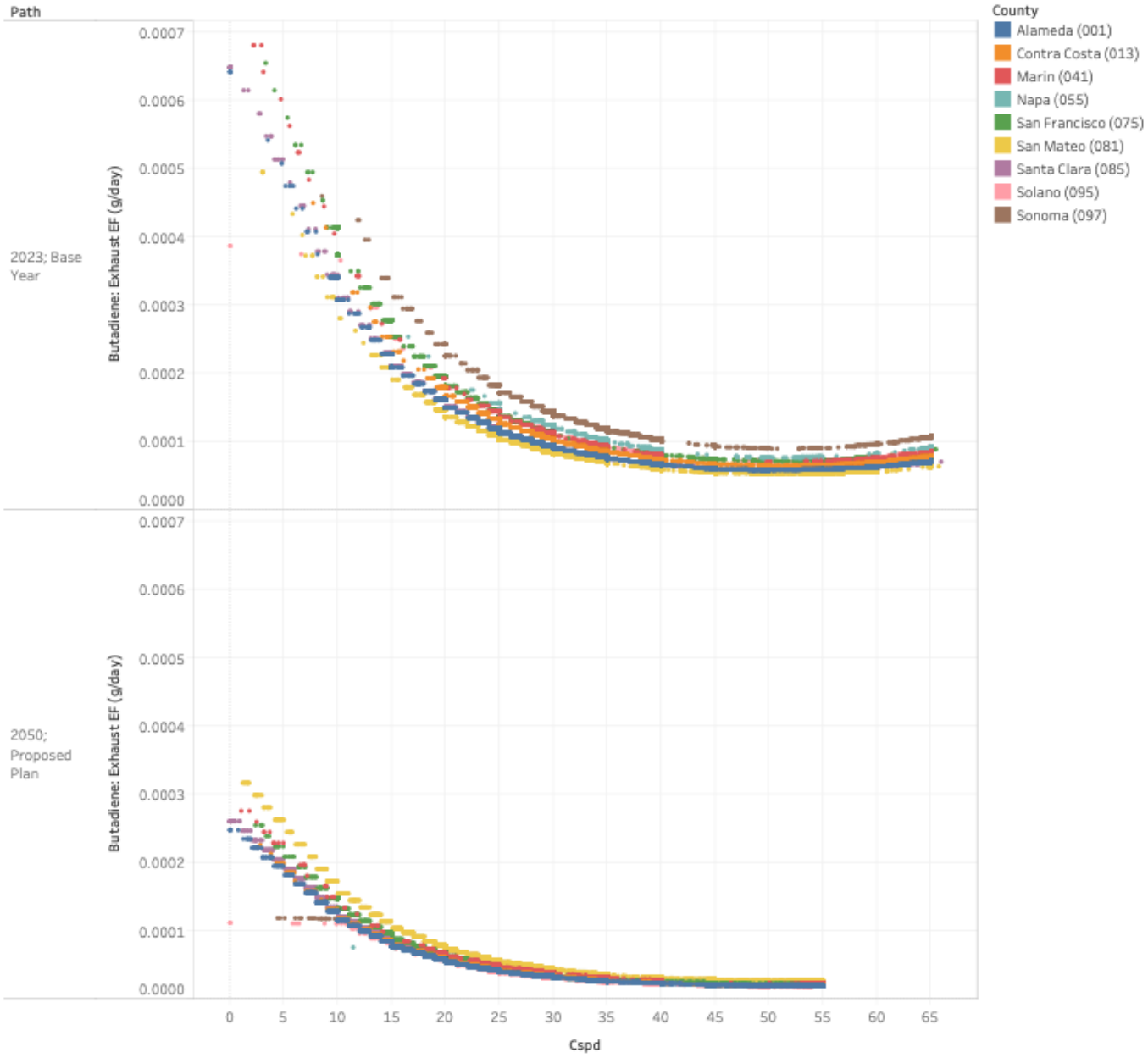
Cspd vs. DieselPM: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2017)



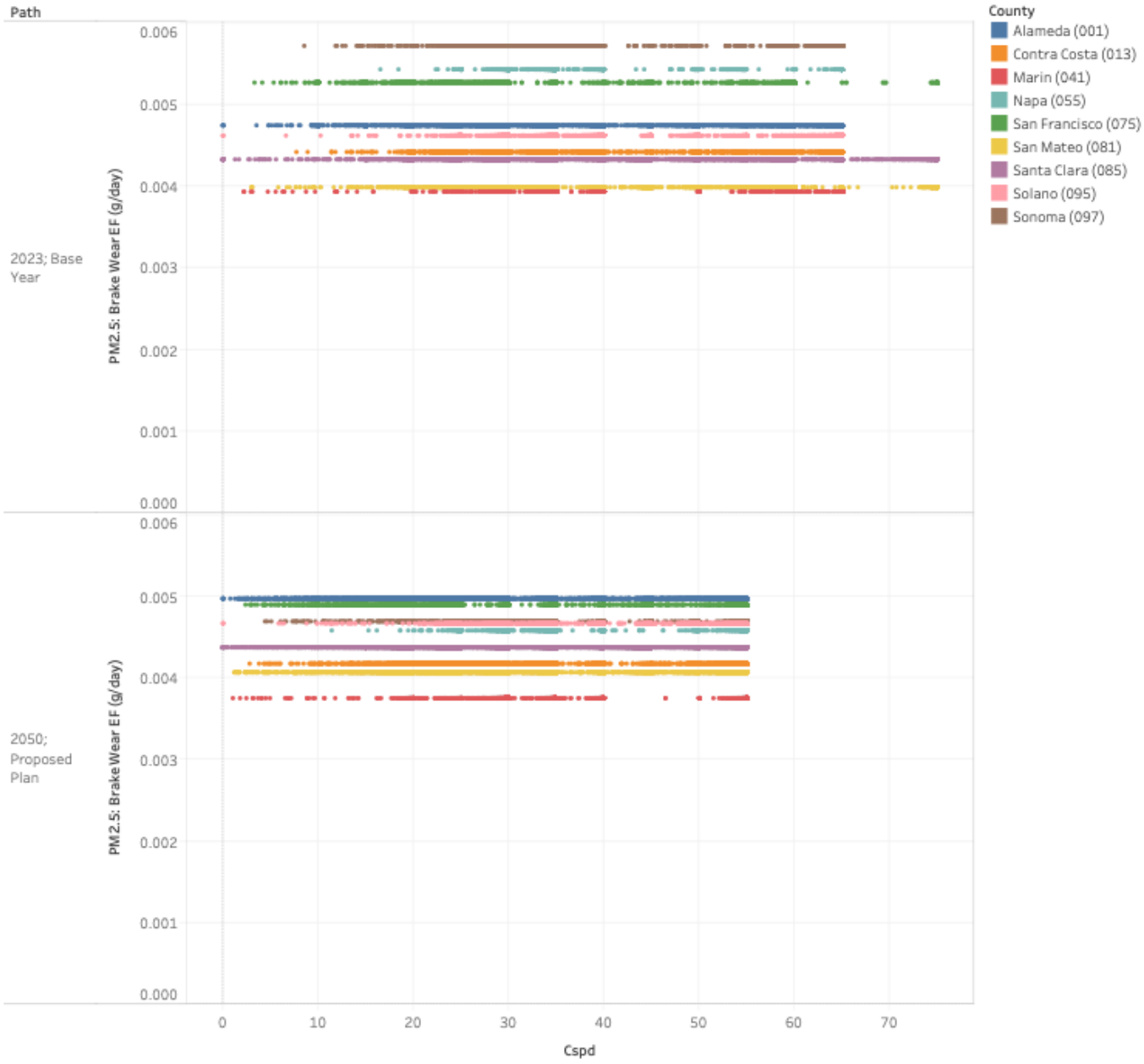
Cspd vs. Benzene: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2017)



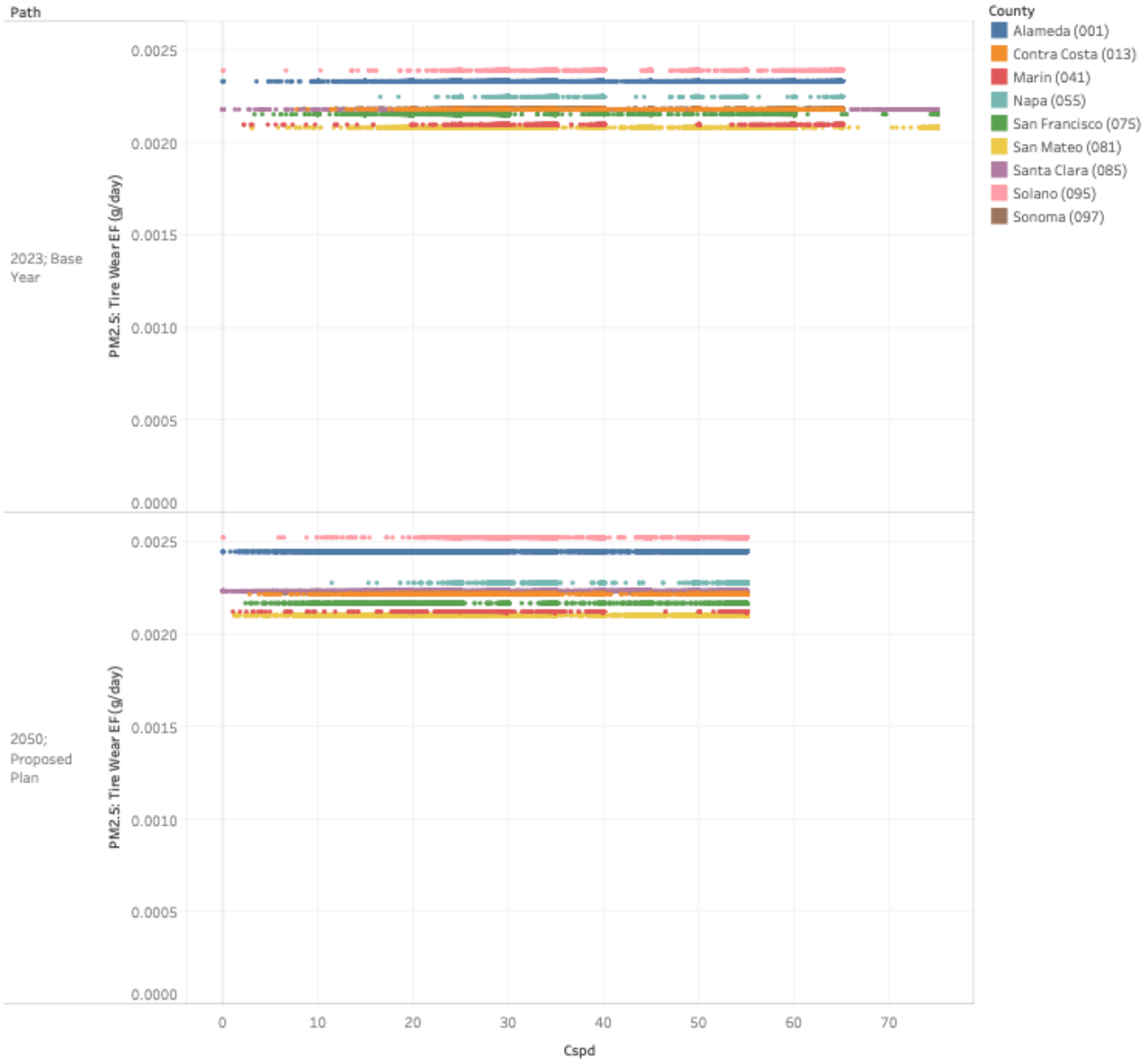
Cspd vs. Butadiene: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2017)



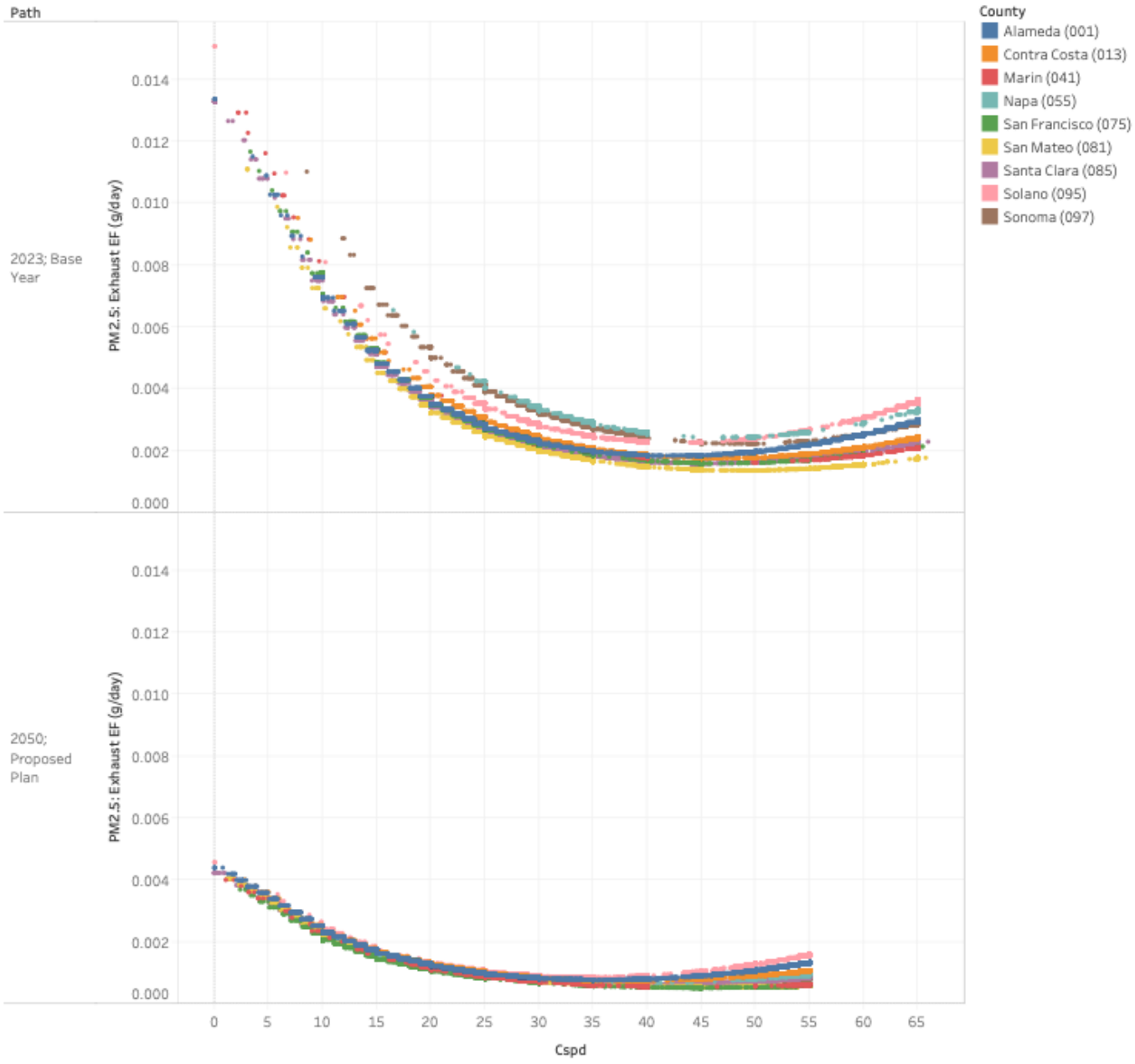
Cspd vs. PM2.5: Brake Wear EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2017)



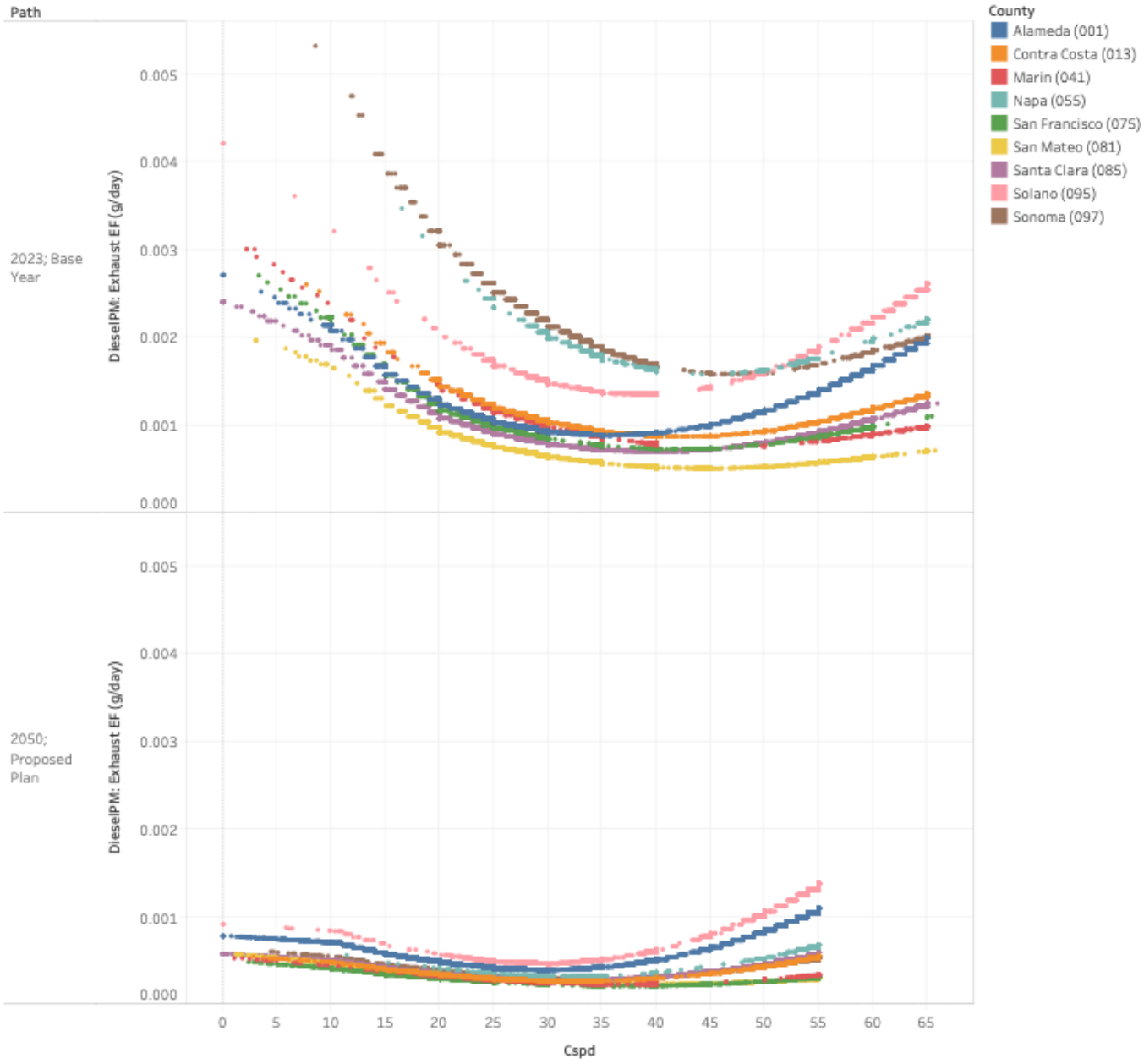
Cspd vs. PM2.5: Tire Wear EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which excludes External Zones. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



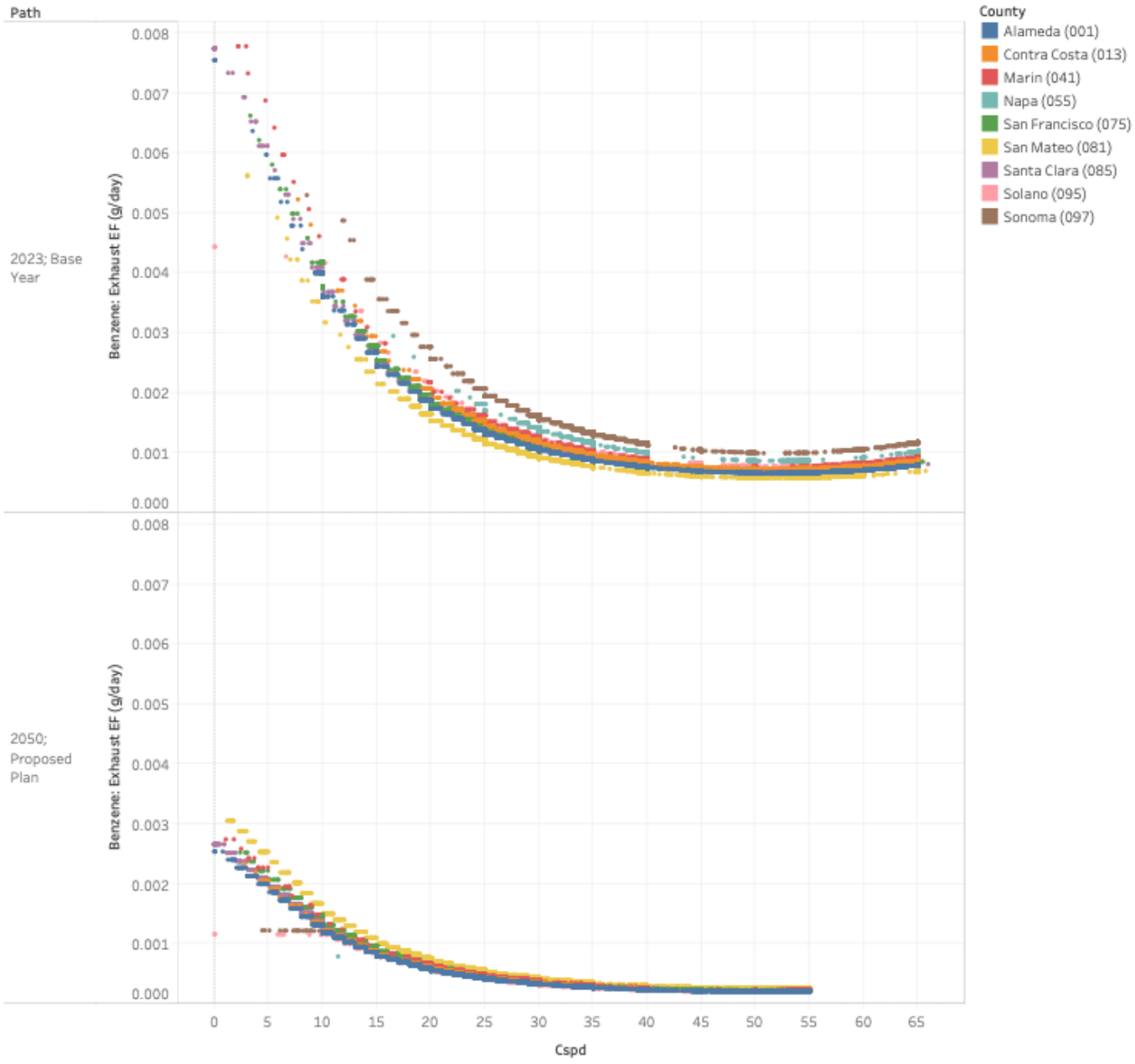
Cspd vs. PM2.5: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



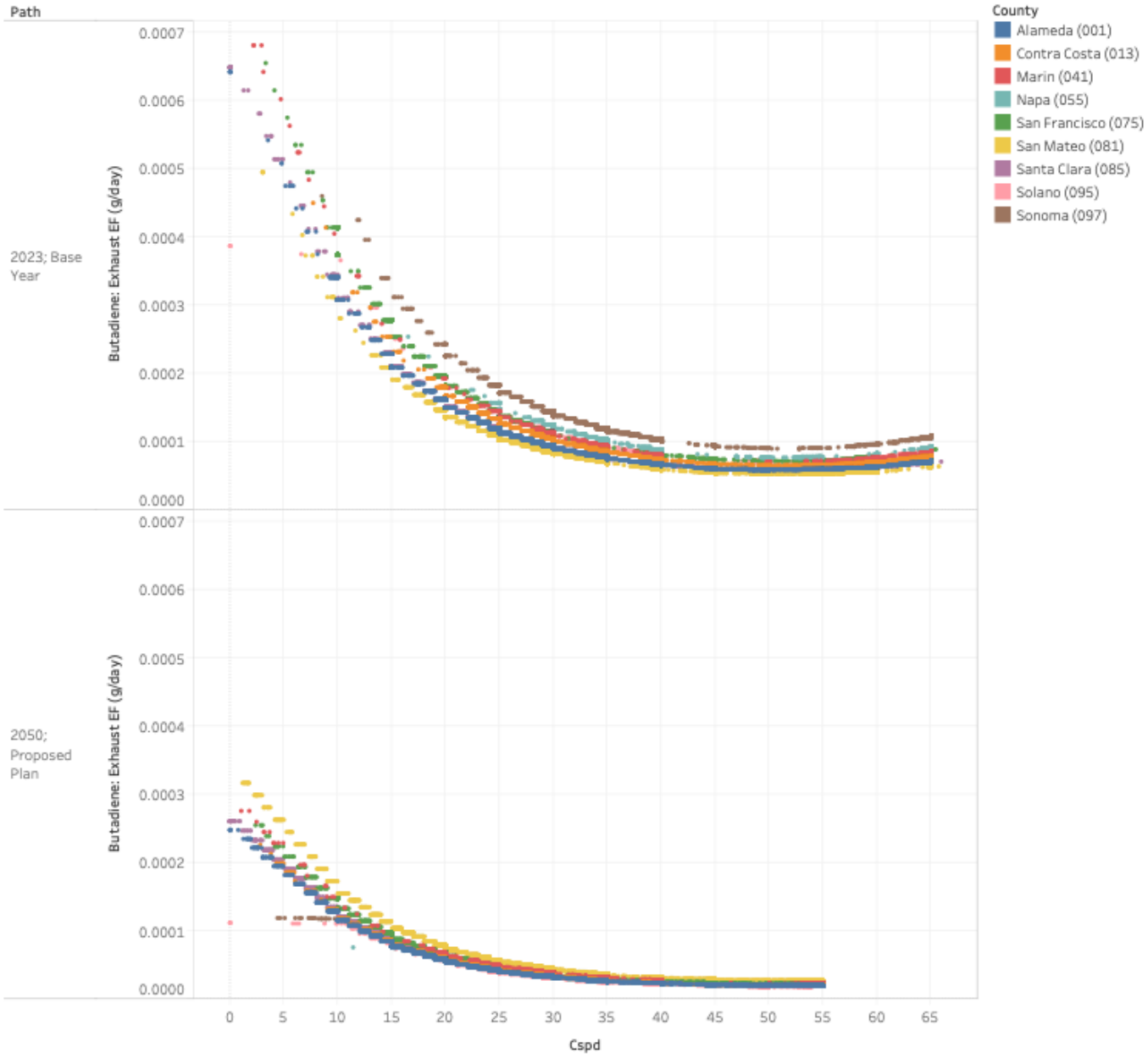
Cspd vs. DieselPM: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



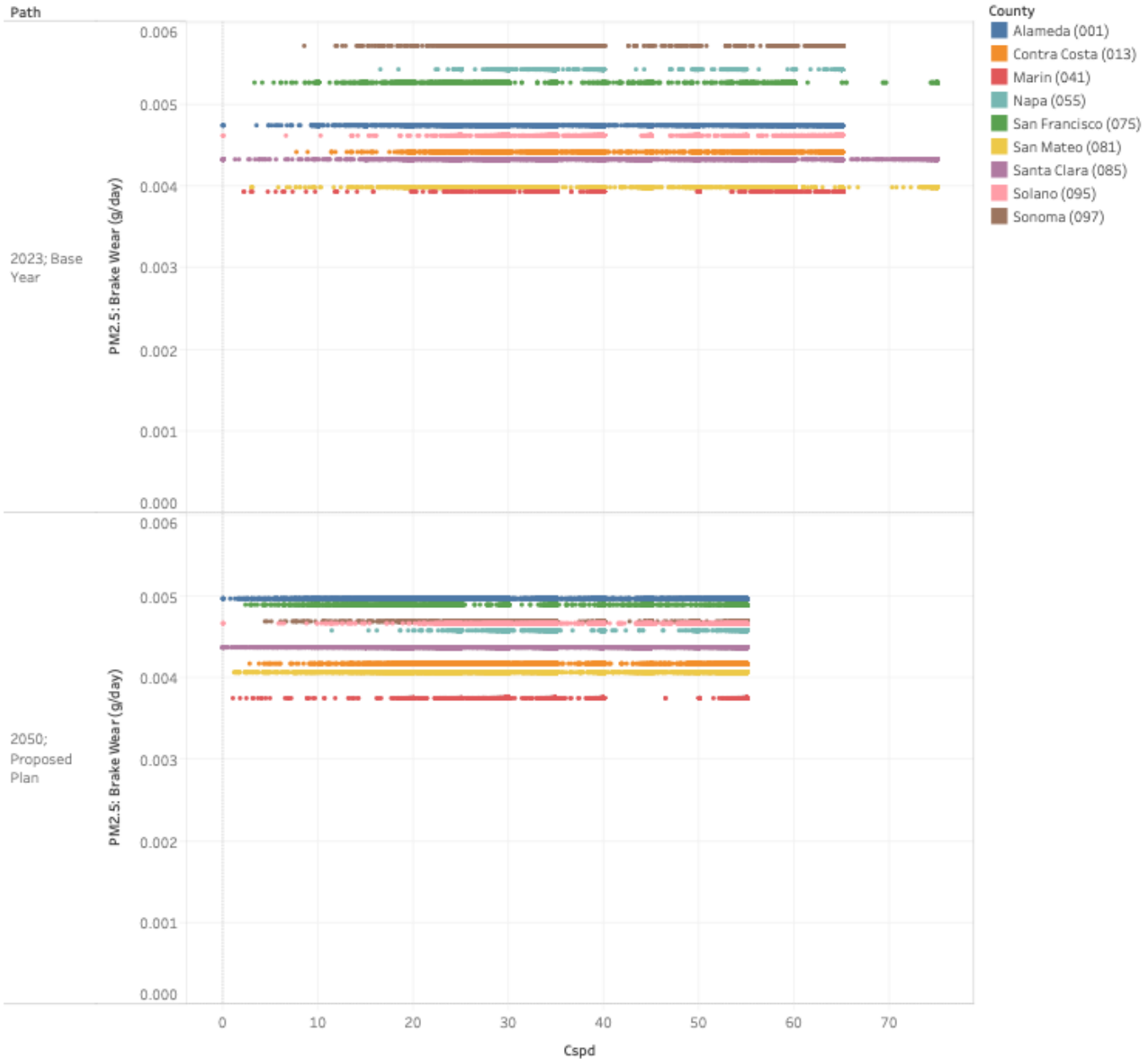
Cspd vs. Benzene: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



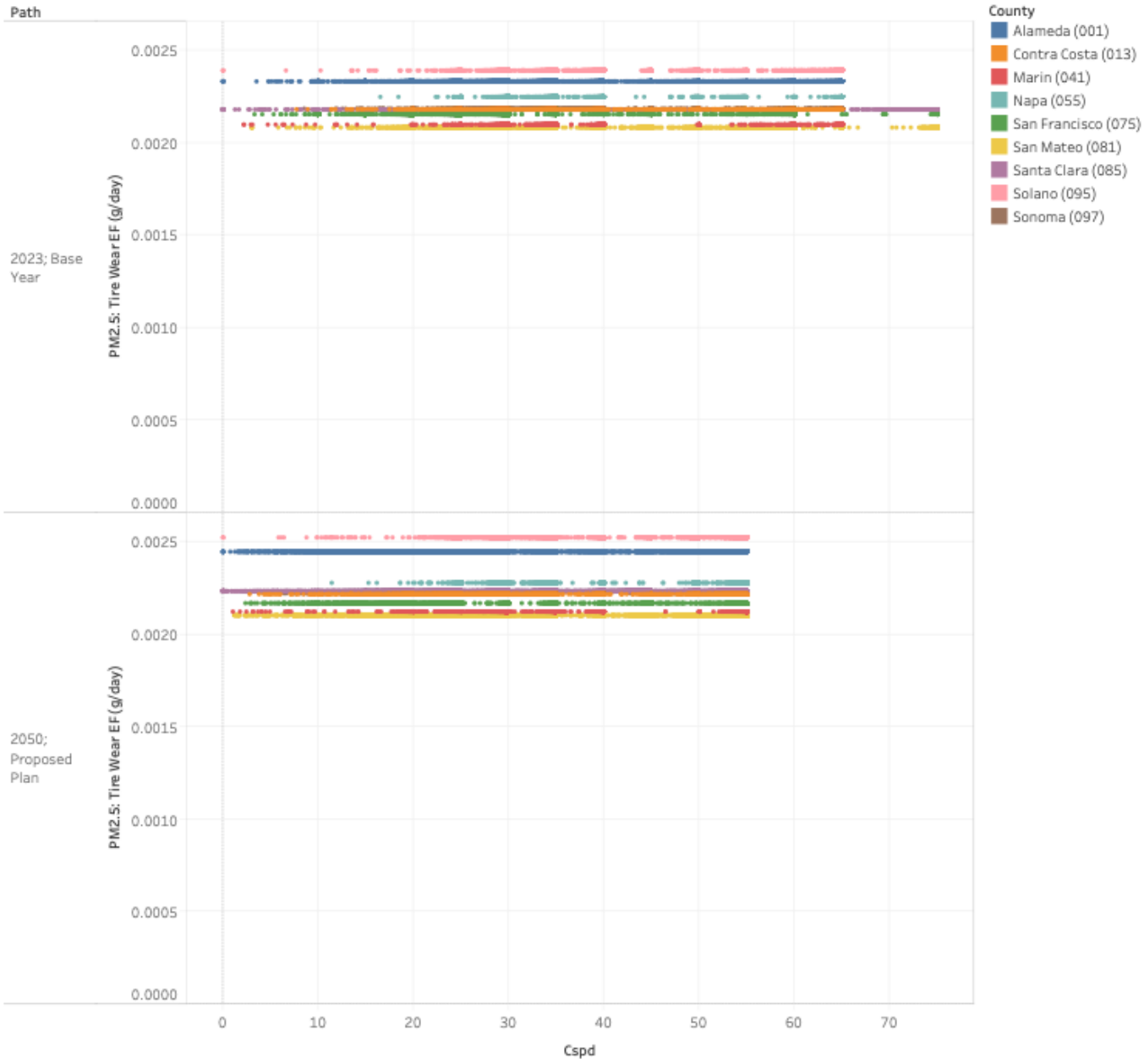
Cspd vs. Butadiene: Exhaust EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



Cspd vs. PM2.5: Brake Wear (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

Emission Rates (2021)



Cspd vs. PM2.5: Tire Wear EF (g/day) broken down by Path. Color shows details about County. The data is filtered on countyName, which keeps 10 of 10 members. The view is filtered on Path, which keeps 2023; Base Year and 2050; Proposed Plan.

EMFAC2017 PM2.5 Entrained Road Dust Emissions

County	2023									2050								
	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions
Alameda	3.434	0.958	0.000024	0.000049	21,267,876	12,002,567	0.259	0.291	0.550	3.603	0.958	0.000026	0.000051	22,857,363	17,122,451	0.292	0.437	0.729
Contra Costa	3.023	0.959	0.000021	0.000043	11,223,023	7,519,561	0.120	0.160	0.281	3.036	0.959	0.000022	0.000043	11,493,535	10,600,798	0.124	0.227	0.351
Marin	2.857	0.955	0.000020	0.000040	3,265,893	1,547,793	0.033	0.031	0.064	2.932	0.955	0.000021	0.000041	3,147,621	2,078,611	0.033	0.043	0.075
Napa	3.275	0.953	0.000023	0.000046	627,094	1,694,168	0.007	0.039	0.046	3.194	0.953	0.000023	0.000045	658,505	1,983,429	0.007	0.044	0.052
San Francisco	2.984	0.954	0.000021	0.000042	3,284,259	4,103,197	0.035	0.086	0.120	3.129	0.954	0.000022	0.000044	3,409,868	5,063,067	0.038	0.111	0.149
San Mateo	3.045	0.959	0.000022	0.000043	9,288,847	4,970,342	0.100	0.107	0.207	3.268	0.959	0.000023	0.000046	9,892,965	7,715,437	0.115	0.178	0.293
Santa Clara	2.978	0.956	0.000021	0.000042	18,080,660	16,877,534	0.190	0.354	0.544	3.027	0.956	0.000021	0.000043	19,277,205	25,493,980	0.206	0.543	0.749
Solano	3.495	0.963	0.000025	0.000050	7,599,055	3,175,017	0.095	0.079	0.174	3.505	0.963	0.000025	0.000050	8,257,142	4,138,154	0.103	0.103	0.206
Sonoma	3.162	0.953	0.000022	0.000044	3,157,317	4,931,609	0.035	0.109	0.145	3.066	0.953	0.000022	0.000043	3,119,175	6,117,929	0.034	0.132	0.165
Total									**2.130**									**2.769**

EMFAC2021 PM2.5 Entrained Road Dust Emissions

County	2023									2050								
	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions
Alameda	3.438	0.958	0.000024	0.000049	21,267,876	12,002,567	0.259	0.292	0.551	3.812	0.958	0.000027	0.000054	22,857,363	17,122,451	0.310	0.462	0.772
Contra Costa	3.148	0.959	0.000022	0.000044	11,223,023	7,519,561	0.125	0.167	0.292	3.246	0.959	0.000023	0.000046	11,493,535	10,600,798	0.132	0.243	0.375
Marin	2.966	0.955	0.000021	0.000042	3,265,893	1,547,793	0.034	0.032	0.066	3.126	0.955	0.000022	0.000044	3,147,621	2,078,611	0.035	0.046	0.080
Napa	3.488	0.953	0.000025	0.000049	627,094	1,694,168	0.008	0.042	0.049	3.384	0.953	0.000024	0.000048	658,505	1,983,429	0.008	0.047	0.055
San Francisco	3.064	0.954	0.000022	0.000043	3,284,259	4,103,197	0.035	0.088	0.124	3.297	0.954	0.000023	0.000046	3,409,868	5,063,067	0.040	0.117	0.157
San Mateo	3.065	0.959	0.000022	0.000043	9,288,847	4,970,342	0.101	0.108	0.208	3.427	0.959	0.000024	0.000048	9,892,965	7,715,437	0.120	0.187	0.307
Santa Clara	3.053	0.956	0.000022	0.000043	18,080,660	16,877,534	0.195	0.363	0.558	3.297	0.956	0.000023	0.000046	19,277,205	25,493,980	0.225	0.592	0.817
Solano	3.603	0.963	0.000026	0.000051	7,599,055	3,175,017	0.098	0.081	0.179	3.871	0.963	0.000028	0.000055	8,257,142	4,138,154	0.114	0.114	0.228
Sonoma	3.373	0.953	0.000024	0.000047	3,157,317	4,931,609	0.038	0.117	0.154	3.297	0.953	0.000023	0.000046	3,119,175	6,117,929	0.036	0.142	0.178
Total									**2.182**									**2.971**

EMFAC2017 PM10 Entrained Road Dust Emissions

County	2023									2050								
	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions
Alameda	3.434	0.958	0.000162	0.000324	21,267,876	12,002,567	1.727	1.943	3.670	3.603	0.958	0.000171	0.000340	22,857,363	17,122,451	1.950	2.910	4.860
Contra Costa	3.023	0.959	0.000143	0.000284	11,223,023	7,519,561	0.801	1.069	1.870	3.036	0.959	0.000143	0.000286	11,493,535	10,600,798	0.824	1.514	2.338
Marin	2.857	0.955	0.000134	0.000267	3,265,893	1,547,793	0.219	0.207	0.426	2.932	0.955	0.000138	0.000274	3,147,621	2,078,611	0.217	0.285	0.502
Napa	3.275	0.953	0.000154	0.000307	627,094	1,694,168	0.048	0.260	0.308	3.194	0.953	0.000150	0.000299	658,505	1,983,429	0.049	0.297	0.346
San Francisco	2.984	0.954	0.000140	0.000279	3,284,259	4,103,197	0.230	0.573	0.803	3.129	0.954	0.000147	0.000293	3,409,868	5,063,067	0.251	0.742	0.993
San Mateo	3.045	0.959	0.000144	0.000286	9,288,847	4,970,342	0.668	0.712	1.380	3.268	0.959	0.000155	0.000308	9,892,965	7,715,437	0.764	1.188	1.953
Santa Clara	2.978	0.956	0.000140	0.000279	18,080,660	16,877,534	1.267	2.357	3.624	3.027	0.956	0.000142	0.000284	19,277,205	25,493,980	1.373	3.620	4.993
Solano	3.495	0.963	0.000166	0.000331	7,599,055	3,175,017	0.631	0.526	1.157	3.505	0.963	0.000167	0.000332	8,257,142	4,138,154	0.688	0.687	1.375
Sonoma	3.162	0.953	0.000148	0.000296	3,157,317	4,931,609	0.234	0.729	0.964	3.066	0.953	0.000144	0.000287	3,119,175	6,117,929	0.224	0.877	1.101
Total									**14.202**									**18.461**

EMFAC2021 PM10 Entrained Road Dust Emissions

County	2023									2050								
	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions	Average Vehicle Weight (tons)	Wet Day Adjustment	Freeway Emission Factor	Other Roadway Emission Factor	Freeway VMT	Other Roadway VMT	Freeway Emissions	Other Roadway Emissions	Total Emissions
Alameda	3.438	0.958	0.000163	0.000324	21,267,876	12,002,567	1.729	1.945	3.674	3.812	0.958	0.000181	0.000360	22,857,363	17,122,451	2.065	3.083	5.148
Contra Costa	3.148	0.959	0.000149	0.000296	11,223,023	7,519,561	0.835	1.115	1.949	3.246	0.959	0.000153	0.000306	11,493,535	10,600,798	0.882	1.621	2.503
Marin	2.966	0.955	0.000139	0.000278	3,265,893	1,547,793	0.228	0.215	0.442	3.126	0.955	0.000147	0.000293	3,147,621	2,078,611	0.231	0.305	0.536
Napa	3.488	0.953	0.000164	0.000327	627,094	1,694,168	0.051	0.277	0.329	3.384	0.953	0.000159	0.000317	658,505	1,983,429	0.052	0.315	0.367
San Francisco	3.064	0.954	0.000144	0.000287	3,284,259	4,103,197	0.236	0.589	0.825	3.297	0.954	0.000155	0.000309	3,409,868	5,063,067	0.264	0.783	1.047
San Mateo	3.065	0.959	0.000145	0.000288	9,288,847	4,970,342	0.672	0.717	1.389	3.427	0.959	0.000162	0.000323	9,892,965	7,715,437	0.802	1.247	2.050
Santa Clara	3.053	0.956	0.000144	0.000286	18,080,660	16,877,534	1.300	2.417	3.717	3.297	0.956	0.000155	0.000310	19,277,205	25,493,980	1.498	3.949	5.447
Solano	3.603	0.963	0.000171	0.000342	7,599,055	3,175,017	0.651	0.542	1.194	3.871	0.963	0.000184	0.000368	8,257,142	4,138,154	0.762	0.761	1.522
Sonoma	3.373	0.953	0.000159	0.000316	3,157,317	4,931,609	0.250	0.779	1.030	3.297	0.953	0.000155	0.000309	3,119,175	6,117,929	0.242	0.944	1.186
Total									**14.549**									**19.805**

Estimating Daily Road Dust PM2.5 and PM10 Emissions (tons/day)

1. Assign average vehicle weight (tons) by vehicle type
2. Calculate VMT-weighted average vehicle weight (tons) by County
3. Assign silt loading (sL) by facility type (FT) from travel model
4. Calculate wet day adjustment
5. Calculate daily network emission factors
6. Compute daily network PM10 and PM2.5 emissions

Resources

AP-42 Paved Road Dust Guidance

- Document: *AP-42, Section 13.2.1 Paved Roads*
- Link: AP-42 Paved Roads PDF

BAAQMD CEQA Guidelines – Appendix E

- Document: Recommended Methods for Screening and Modeling Local Risks and Hazards
- Link: BAAQMD Appendix E PDF

Custom Data Used

- **Modeled VMT by County by Facility Type:** Provided from travel model outputs

---

1) Assign Average Vehicle Weight by Veh Type (in Tons)

Logic by Weight	Veh	Tons
Light-Duty Vehicles	LDA	1.75
	LDT1	2.25
	LDT2	2.75
	MCY	0.25
Medium-Duty Vehicles	MDV	5
Light Heavy-Duty Truck	LHD1	7
	LHD2	8.75
Medium Heavy-Duty Trucks	T6	11.5
Heavy Heavy-Duty Trucks	T7	18
Buses	All Other Buses	15
	Motor Coach	15
	OBUS	15
	SBUS	12
	UBUS	15
Misc.	MH	7

Source: *EMFAC2021 Volume III, Appendix 6.8 and CARB Road Dust Methodology (2019)*

---

2) Calculate VMT-Weighted Average Vehicle Weight by County

Based on EMFAC default VMT by vehicle type by county.

Equation:

$$W_{County} = \frac{\sum (VMT_i \times W_i)}{\sum VMT_i}$$

Where:

- W_{county} = VMT-weighted average vehicle weight for the county (tons)
- VMT_i = VMT for vehicle class *i*
- W_i = assigned average vehicle weight (tons) for class *i*

---

3) Assign Silt Loading (sL) by Facility Type (FT)

Where:

Table 22 Road Surface Silt Loading Factor (sL) by Road Type Used in CARB Method to Estimate Emission Factors from Road Dust Emissions

CARB Road Type	Average Daily Traffic Count	sL (g/m^2)
Freeways	≥ 10,000	0.015
Major Streets	≥5,000 and <10,000	0.032
Collector Streets	≥ 500 and <5,000	0.032
Local Streets	< 500	0.320

Notes: CARB = California Air Resources Board; grams per meter square; g/m^2; sL = silt loading factor.
Values taken from California Air Resources Board (2021c).

Source: *BAAQMD Appendix E — Table 22: Road Surface Silt Loading (sL) Factor by Road Type*

---

4) Calculate Wet Day Adjustment by County

Equation:

$$Wet\ Day\ Adjustment_{county} = 1 - \left(\frac{P_{county}}{4 \times 365}\right)$$

Where:

- P_{county} = number of wet days by county (BAAQMD's Appendix E Table 23, see below)

Table 23 Annual Rainfall Days (P) Where 0.01 Inch or Greater Precipitation Was Recorded by County

County	P (days)
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Notes: P = annual rainfall days
Values taken from CARB (2021c).

Source: *BAAQMD Appendix E — Table 23: Annual Rainfall Days (P) Where 0.01 Inch or Greater Precipitation Was Recorded by County*

---

5) Calculate Daily Network Emission Factors

Equation:

$$EF_{link} = k \times (sL_{link})^{0.91} \times (W_{county})^{1.02} \times Wet\ Day\ Adjustment_{county}$$

- EF_{link} = daily link-specific emission factor (lbs/VMT)
- k = 0.0022 for PM10, 0.00033 for PM2.5
- sL_{link} = silt loading factor (g/m^2), based on modeled daily roadway volume
- W_{county} = county-specific VMT-weighted average vehicle weight (tons)
- $Wet\ Day\ Adjustment_{county}$ = county-specific wet day adjustment factor calculated in Step 4

---

6) Compute Daily Network PM10 and PM2.5 Emissions (tons/day)

Equation:

$$E_{link} = \frac{VMT_{link} \times EF_{link}}{2000}$$

Where:

- E_{link} = daily link-specific emission (tons/VMT)
- VMT_{link} = daily network VMT from "avgload5period"
- EF_{link} = daily link-specific emission factor from Step 5

Appendix E

Noise Modeling

Construction Equipment Average Noise Levels

Project Name: PLACEHOLDER

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (dBA L_{eq})
Thresholds		
FTA Daytime Standard	84	90.0
FTA Nighttime Standard	265	80.0
Sensitive Receptors		

Equipment[1]	Reference Emission Noise Levels (dBA L_{max}) at 50 feet[2]	Usage Factor[2]
Impact Pile Driver	101	0.2
Crane	81	0.2
Jackhammer	89	0.2
Dump Truck	76	0.4
Generator	81	0.5
Backhoe	78	0.4

Ground Type	Hard
Source Height	8
Receiver Height	5
Ground Factor[3]	0.00

Predicted Noise Level [4]	dBA L_{eq} at 50 feet[4]
Impact Pile Driver	94.0
Crane	73.0
Jackhammer	82.0
Dump Truck	72.0
Generator	78.0
Backhoe	74.0

Combined Predicted Noise Level (dBA L_{eq} at 50 feet)
94.5

Sources:

[1] Where measured values are not available, noise levels based on the Construction Noise Control Specifiction 721.560 were used.

[2] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[3] Based on Figure 4-26 from the Federal Transit Noise and Vibration Impact Assessment, 2018 (pg 86).

[4] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2018 (pg 177).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2018: pg 86); and

D = Distance from source to receiver.

Construction Equipment Maximum Noise Levels

Project Name: PLACEHOLDER

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (dBA L_{max})
Thresholds		
Caltrans Standard	294	86.0
Sensitive Receptors		

Equipment[1]	Reference Emission Noise Levels (dBA L_{max}) at 50 feet[2]
Impact Pile Driver	101
Crane	81
Jackhammer	89
Dump Truck	76
Backhoe	78
Generator	81

Ground Type	Hard
Source Height	8
Receiver Height	5
Ground Factor[3]	0.00

Predicted Noise Level [3]	dBA L_{max} at 50 feet[3]
Impact Pile Driver	101.0
Crane	81.0
Jackhammer	89.0
Dump Truck	76.0
Backhoe	78.0
Generator	81.0

Combined Predicted Noise Level (dBA L_{max} at 50 feet)
101.4

Sources:

[1] Where measured values are not available, noise levels based on the Construction Noise Control Specifiction 721.560 were used.

[2] Based on Figure 4-26 from the Federal Transit Noise and Vibration Impact Assessment, 2018 (pg 86).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2018 (pg 177).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor, assumed to be 1 for the purposes of the calculation of maximum noise levels;

G = Constant that accounts for topography and ground effects (FTA 2018: pg 86); and

D = Distance from source to receiver.

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Auger Drill Rig	20	85	84	36	79.0	72.0	100	78.0	71.0
Backhoe	40	80	78	372	74.0	70.0	100	72.0	68.0
Bar Bender	20	80	80	0	74.0	67.0	100		
Blasting	100	94	94	0	88.0		100		
Boring Jack Power Unit	50	80	83	1	74.0	71.0	100	77.0	74.0
Chain Saw	20	85	84	46	79.0	72.0	100	78.0	71.0
Clam Shovel (dropping)	20	93	87	4	87.0	80.0	100	81.0	74.0
Compactor (ground)	20	80	83	57	74.0	67.0	100	77.0	70.0
Compressor (air)	40	80	78	18	74.0	70.0	100	72.0	68.0
Concrete Batch Plant	15	83	83	0	77.0	68.7	100		
Concrete Mixer Truck	40	85	79	40	79.0	75.0	100	73.0	69.0
Concrete Pump Truck	20	82	81	30	76.0	69.0	100	75.0	68.0
Concrete Saw	20	90	90	55	84.0	77.0	100	84.0	77.0
Crane	16	85	81	405	79.0	71.0	100	75.0	67.0
Dozer	40	85	82	55	79.0	75.0	100	76.0	72.0
Drill Rig Truck	20	84	79	22	78.0	71.0	100	73.0	66.0
Drum Mixer	50	80	80	1	74.0	71.0	100	74.0	71.0
Dump Truck	40	84	76	31	78.0	74.0	100	70.0	66.0
Excavator	40	85	81	170	79.0	75.0	100	75.0	71.0
Flat Bed Truck	40	84	74	4	78.0	74.0	100	68.0	64.0
Front End Loader	40	80	79	96	74.0	70.0	100	73.0	69.0
Generator	50	82	81	19	76.0	73.0	100	75.0	72.0
Generator (<25KVA, VMS signs)	50	70	73	74	64.0	61.0	100	67.0	64.0
Gradall	40	85	83	70	79.0	75.0	100	77.0	73.0
Grader	40	85	85	0	79.0	75.0	100		
Grapple (on Backhoe)	40	85	87	1	79.0	75.0	100	81.0	77.0
Horizontal Boring Hydr. Jack	25	80	82	6	74.0	68.0	100	76.0	70.0
Hydra Break Ram	10	90	90	0	84.0	74.0	100		
Impact Pile Driver	20	95	101	11	89.0	82.0	100	95.0	88.0
Jackhammer	20	85	89	133	79.0	72.0	100	83.0	76.0
Man Lift	20	85	75	23	79.0	72.0	100	69.0	62.0
Mounted Impact Hammer (hoe ram)	20	90	90	212	84.0	77.0	100	84.0	77.0
Pavement Scarafier	20	85	90	2	79.0	72.0	100	84.0	77.0
Paver	50	85	77	9	79.0	76.0	100	71.0	68.0
Pickup Truck	40	55	75	1	49.0	45.0	100	69.0	65.0
Pneumatic Tools	50	85	85	90	79.0	76.0	100	79.0	76.0
Pumps	50	77	81	17	71.0	68.0	100	75.0	72.0
Refrigerator Unit	100	82	73	3	76.0	76.0	100	67.0	67.0
Rivit Buster/chipping gun	20	85	79	19	79.0	72.0	100	73.0	66.0
Rock Drill	20	85	81	3	79.0	72.0	100	75.0	68.0
Roller	20	85	80	16	79.0	72.0	100	74.0	67.0
Sand Blasting (Single Nozzle)	20	85	96	9	79.0	72.0	100	90.0	83.0
Scraper	40	85	84	12	79.0	75.0	100	78.0	74.0
Shears (on backhoe)	40	85	96	5	79.0	75.0	100	90.0	86.0
Slurry Plant	100	78	78	1	72.0	72.0	100	72.0	72.0
Slurry Trenching Machine	50	82	80	75	76.0	73.0	100	74.0	71.0
Soil Mix Drill Rig	50	80	80	0	74.0	71.0	100		
Tractor	40	84	84	0	78.0	74.0	100		
Vacuum Excavator (Vac-truck)	40	85	85	149	79.0	75.0	100	79.0	75.0
Vacuum Street Sweeper	10	80	82	19	74.0	64.0	100	76.0	66.0
Ventilation Fan	100	85	79	13	79.0	79.0	100	73.0	73.0
Vibrating Hopper	50	85	87	1	79.0	76.0	100	81.0	78.0
Vibratory Concrete Mixer	20	80	80	1	74.0	67.0	100	74.0	67.0
Vibratory Pile Driver	20	95	101	44	89.0	82.0	100	95.0	88.0
Warning Horn	5	85	83	12	79.0	66.0	100	77.0	64.0
Welder / Torch	40	73	74	5	67.0	63.0	100	68.0	64.0

Traffic Noise Spreadsheet Calculator - Summary of Net Changes

Project: Plan Bay Area 2050+

Segment Description and Location			Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
	County	Facility Type			
	Alameda	Freeway	76.5	75.7	-0.8
		Expressway	72.7	73.9	1.2
		Major arterial	63.7	63.4	-0.3
		Collector	56.9	60.1	3.2
	Contra Costa	Freeway	75.6	74.0	-1.7
		Expressway	70.8	71.1	0.2
		Major arterial	61.8	61.5	-0.3
		Collector	56.8	59.2	2.4
	Marin	Freeway	75.0	71.9	-3.2
		Expressway	n/a	n/a	n/a
		Major arterial	62.3	60.4	-1.9
		Collector	55.6	56.3	0.7
	Napa	Freeway	75.0	71.4	-3.6
		Expressway	72.7	72.0	-0.7
		Major arterial	63.7	61.6	-2.1
		Collector	55.7	56.7	0.9
	San Francisco	Freeway	76.8	76.2	-0.6
		Expressway	68.6	69.6	1.0
		Major arterial	64.5	64.4	-0.1
		Collector	54.4	58.3	3.9
	San Mateo	Freeway	76.3	75.1	-1.2
		Expressway	71.2	72.6	1.3
		Major arterial	62.2	62.4	0.2
		Collector	56.4	59.4	3.0
	Santa Clara	Freeway	75.0	74.2	-0.8
		Expressway	70.8	73.3	2.5
		Major arterial	62.7	62.7	0.0
		Collector	55.8	58.8	3.1
	Solano	Freeway	75.9	72.3	-3.6
		Expressway	69.0	68.8	-0.2
		Major arterial	60.6	58.9	-1.7
		Collector	56.5	57.7	1.1
	Sonoma	Freeway	73.1	70.9	-2.2
		Expressway	71.7	70.7	-1.0
		Major arterial	63.0	61.8	-1.2
		Collector	59.1	60.1	1.1

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator - Existing (2023) Conditions

Project: Plan Bay Area 2050+

Noise Level Descriptor: Ldn
Site Conditions: Hard
Traffic Input: ADT
Traffic K-Factor:

Segment Description and Location		Input										Output				
				Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
County	Facility Type	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	Ldn, (dBA)[5,6,7]	75 dBA	70 dBA	65 dBA	60 dBA
Alameda	Freeway	40,186	56	106	112	87.9%	9.7%	2.4%	72.9%	6.1%	20.9%	76.5	154	488	1543	4879
	Expressway	21,890	51	106	112	91.7%	6.9%	1.4%	68.0%	7.2%	24.8%	72.7	64	202	639	2022
	Major arterial	8,481	33	106	112	87.4%	10.5%	2.1%	76.3%	5.8%	18.0%	63.7	8	25	80	253
	Collector	2,629	28	106	106	88.2%	10.4%	1.3%	77.3%	5.5%	17.2%	56.9	2	5	16	51
Contra Costa	Freeway	30,370	58	106	112	88.3%	9.4%	2.3%	73.4%	6.1%	20.5%	75.6	125	396	1253	3962
	Expressway	12,620	54	106	106	92.9%	5.9%	1.2%	69.7%	6.6%	23.7%	70.8	40	128	404	1278
	Major arterial	5,621	35	106	112	90.1%	8.7%	1.2%	76.5%	5.6%	17.9%	61.8	5	16	52	163
	Collector	2,327	31	106	106	90.5%	8.4%	1.1%	76.2%	5.8%	18.0%	56.8	2	5	16	51
Marin	Freeway	24,027	58	106	112	85.4%	11.0%	3.6%	73.3%	6.2%	20.5%	75.0	110	348	1100	3477
	Expressway	n/a	n/a													
	Major arterial	5,684	35	106	112	86.7%	11.8%	1.5%	76.7%	5.7%	17.5%	62.3	6	19	59	186
	Collector	1,305	34	106	106	89.7%	8.8%	1.5%	74.5%	6.1%	19.3%	55.6	1	4	12	39
Napa	Freeway	22,775	60	106	112	86.7%	10.7%	2.6%	73.3%	5.9%	20.8%	75.0	109	343	1086	3433
	Expressway	17,037	54	106	112	84.8%	12.0%	3.3%	73.8%	5.8%	20.3%	72.7	64	203	641	2027
	Major arterial	5,723	37	106	112	85.8%	11.2%	3.0%	74.5%	5.8%	19.7%	63.7	8	25	80	253
	Collector	1,080	35	106	106	89.1%	8.4%	2.5%	72.6%	5.9%	21.6%	55.7	1	4	13	40
San Francisco	Freeway	49,283	52	106	118	84.2%	12.6%	3.2%	72.9%	6.7%	20.4%	76.8	169	535	1693	5352
	Expressway	15,416	45	106	118	92.2%	6.8%	1.0%	75.6%	5.8%	18.7%	68.6	25	81	255	806
	Major arterial	10,453	27	106	112	78.3%	18.8%	2.9%	76.2%	6.0%	17.8%	64.5	10	31	97	306
	Collector	1,636	20	106	106	83.3%	15.0%	1.7%	77.3%	5.7%	17.0%	54.4	1	3	9	29
San Mateo	Freeway	33,760	56	106	112	83.4%	12.2%	4.4%	73.8%	6.0%	20.2%	76.3	148	469	1483	4690
	Expressway	19,573	47	106	112	85.9%	12.0%	2.1%	74.7%	6.2%	19.0%	71.2	46	144	456	1441
	Major arterial	6,310	33	106	112	87.2%	11.1%	1.6%	76.2%	5.8%	18.0%	62.2	6	18	58	183
	Collector	2,111	29	106	106	87.8%	10.8%	1.4%	76.1%	5.8%	18.1%	56.4	1	5	15	47
Santa Clara	Freeway	28,183	56	106	112	86.6%	11.0%	2.4%	73.9%	6.0%	20.1%	75.0	108	342	1080	3416
	Expressway	18,521	48	106	112	88.5%	10.0%	1.5%	75.8%	5.6%	18.7%	70.8	41	130	412	1304
	Major arterial	7,778	32	106	112	88.1%	10.5%	1.4%	76.8%	5.6%	17.6%	62.7	6	20	63	201
	Collector	2,117	29	106	106	90.2%	8.7%	1.0%	76.9%	5.6%	17.6%	55.8	1	4	13	40
Solano	Freeway	31,856	59	106	112	90.9%	7.6%	1.5%	72.0%	5.8%	22.3%	75.9	134	422	1335	4222
	Expressway	9,853	52	106	112	90.6%	7.8%	1.6%	74.2%	5.6%	20.2%	69.0	27	87	274	866
	Major arterial	3,605	37	106	106	91.6%	7.3%	1.1%	74.3%	5.7%	20.0%	60.6	4	12	38	121
	Collector	2,327	31	106	106	91.5%	7.7%	0.8%	76.5%	5.7%	17.8%	56.5	1	5	15	47
Sonoma	Freeway	14,698	60	106	112	86.4%	10.6%	3.1%	73.9%	5.8%	20.3%	73.1	71	224	709	2243
	Expressway	16,601	52	106	112	88.9%	8.0%	3.1%	73.7%	6.0%	20.3%	71.7	52	163	515	1629
	Major arterial	4,904	38	106	106	87.9%	9.4%	2.6%	74.1%	6.1%	19.8%	63.0	7	21	67	213
	Collector	2,884	33	106	106	89.1%	8.9%	2.0%	74.7%	5.8%	19.6%	59.1	3	9	27	85

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project: Plan Bay Area 2050+

Noise Level Descriptor: Ldn
Site Conditions: Hard
Traffic Input: ADT
Traffic K-Factor:

Number	County	Facility Type	ADT	Speed (mph)	Distance to Directional Centerline, (feet)[4] Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	Ldn, (dBA)[5,6,7]	Distance to Contour, (feet)[3] 75 dBA	70 dBA	65 dBA	60 dBA
			Input										**Output**				
Existing Conditions																	
1	Alameda	Freeway	41,549	51	106	112	89.0%	8.1%	2.5%	70.0%	7.2%	22.8%	75.7	127	401	1270	4015
2		Expressway	30,191	51	106	112	92.1%	6.0%	1.4%	68.7%	7.2%	24.1%	73.9	84	266	841	2660
3		Major arterial	11,255	27	106	112	87.5%	10.2%	2.3%	77.4%	5.1%	17.5%	63.4	7	24	75	237
4		Collector	4,961	28	106	106	87.2%	11.0%	1.9%	77.3%	5.3%	17.4%	60.1	3	11	34	108
5	Contra Costa	Freeway	30,801	51	106	112	86.3%	6.3%	2.4%	70.5%	7.1%	22.4%	74.0	86	271	856	2708
6		Expressway	13,528	54	106	106	93.1%	4.6%	1.2%	68.3%	7.0%	24.7%	71.1	43	135	428	1352
7		Major arterial	7,424	30	106	112	89.7%	8.4%	1.4%	78.1%	4.8%	17.1%	61.5	5	15	48	153
8		Collector	4,063	31	106	106	89.8%	8.2%	1.3%	77.4%	5.0%	17.6%	59.2	3	9	28	89
9	Marin	Freeway	21,756	52	106	112	63.3%	5.3%	2.8%	70.8%	7.1%	22.1%	71.9	53	167	529	1674
10		Expressway	n/a	n/a													
11		Major arterial	7,117	29	106	112	69.1%	6.7%	1.6%	76.5%	5.7%	17.8%	60.4	4	12	38	120
12		Collector	2,039	34	106	106	77.6%	4.8%	1.3%	75.1%	5.6%	19.3%	56.3	1	5	14	45
13	Napa	Freeway	23,049	51	106	112	60.1%	4.9%	2.1%	71.5%	6.4%	22.1%	71.4	47	150	474	1499
14		Expressway	19,795	54	106	112	67.1%	6.4%	2.5%	72.6%	6.2%	21.3%	72.0	54	172	544	1719
15		Major arterial	5,751	32	106	112	80.9%	7.8%	2.4%	73.7%	5.9%	20.4%	61.6	5	16	50	158
16		Collector	1,456	35	106	106	90.9%	6.9%	2.2%	72.9%	5.7%	21.4%	56.7	2	5	16	49
17	San Francisco	Freeway	52,248	48	106	118	86.1%	10.4%	3.0%	68.7%	8.4%	22.9%	76.2	148	468	1480	4679
18		Expressway	21,048	45	106	118	93.4%	5.8%	0.8%	77.0%	5.1%	17.8%	69.6	32	102	323	1021
19		Major arterial	11,027	22	106	112	75.1%	20.5%	3.5%	76.0%	6.2%	17.9%	64.4	10	30	95	301
20		Collector	3,639	20	106	106	81.4%	16.5%	2.1%	77.4%	5.6%	17.0%	58.3	2	7	23	72
21	San Mateo	Freeway	34,713	50	106	112	87.0%	9.1%	3.8%	69.2%	7.7%	23.1%	75.1	113	356	1126	3560
22		Expressway	25,803	47	106	112	86.8%	10.6%	2.6%	73.5%	6.5%	20.0%	72.6	62	196	621	1963
23		Major arterial	9,280	27	106	112	87.3%	10.7%	2.0%	77.7%	4.9%	17.4%	62.4	6	19	60	191
24		Collector	4,067	29	106	106	87.1%	11.3%	1.7%	77.3%	5.1%	17.6%	59.4	3	9	29	93
25	Santa Clara	Freeway	30,340	50	106	112	87.7%	9.8%	2.6%	70.2%	7.5%	22.3%	74.2	91	287	908	2871
26		Expressway	30,673	48	106	112	87.0%	11.2%	1.9%	74.6%	6.0%	19.4%	73.3	74	234	741	2343
27		Major arterial	11,042	25	106	112	86.6%	11.6%	1.8%	78.4%	4.9%	16.7%	62.7	6	20	64	203
28		Collector	3,731	29	106	106	87.5%	11.0%	1.5%	77.8%	5.1%	17.1%	58.8	3	8	26	81
29	Solano	Freeway	32,118	52	106	112	49.3%	4.1%	1.6%	71.0%	6.1%	22.9%	72.3	58	183	579	1832
30		Expressway	11,766	52	106	112	65.9%	5.8%	2.3%	75.0%	5.3%	19.7%	68.8	26	83	264	835
31		Major arterial	4,425	32	106	106	68.9%	5.5%	1.1%	75.3%	5.1%	19.6%	58.9	3	8	26	82
32		Collector	3,220	31	106	106	82.8%	6.5%	1.1%	76.7%	5.3%	18.0%	57.7	2	6	20	62
29	Sonoma	Freeway	14,509	52	106	112	86.5%	5.2%	3.0%	71.4%	6.7%	21.9%	70.9	43	135	426	1346
30		Expressway	14,896	53	106	112	74.2%	4.1%	3.7%	73.8%	6.0%	20.1%	70.7	41	129	407	1287
31		Major arterial	5,940	33	106	106	85.4%	5.7%	2.6%	74.7%	5.7%	19.6%	61.8	5	16	51	162
32		Collector	3,960	33	106	106	89.7%	6.2%	2.1%	74.0%	5.9%	20.2%	60.1	3	11	34	109

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Early Morning						AM Peak						Midday					
Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks
1,897	632	56	87.90%	9.70%	2.40%	9,609	2,402	53	95.80%	3.40%	0.80%	11,207	2,241	55	70.00%	29.00%	1.00%
1,648	549	50	91.70%	6.90%	1.40%	4,714	1,178	46	96.20%	3.10%	0.80%	6,002	1,200	47	72.90%	26.40%	0.70%
218	73	33	87.40%	10.50%	2.10%	1,972	493	32	97.90%	1.70%	0.40%	2,486	497	32	82.40%	17.20%	0.50%
55	18	28	88.20%	10.40%	1.30%	617	154	27	98.60%	1.10%	0.20%	759	152	27	84.80%	15.00%	0.20%
1,254	418	58	88.30%	9.40%	2.30%	7,560	1,890	55	96.80%	2.60%	0.60%	8,215	1,643	57	72.50%	26.80%	0.90%
889	296	51	92.90%	5.90%	1.20%	2,887	722	48	97.50%	2.00%	0.50%	3,338	668	49	70.90%	28.40%	0.80%
136	45	35	90.10%	8.70%	1.20%	1,360	340	34	98.70%	1.10%	0.20%	1,593	319	34	85.10%	14.70%	0.30%
54	18	31	90.50%	8.40%	1.10%	563	141	31	98.90%	0.90%	0.20%	652	130	31	86.20%	13.70%	0.20%
896	299	58	85.40%	11.00%	3.60%	6,235	1,559	57	96.40%	2.80%	0.80%	6,221	1,244	58	70.50%	28.30%	1.30%
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
122	41	35	86.70%	11.80%	1.50%	1,324	331	34	98.40%	1.40%	0.20%	1,677	335	34	82.30%	17.40%	0.30%
34	11	34	89.70%	8.80%	1.50%	338	85	34	98.30%	1.40%	0.30%	346	69	34	83.70%	16.00%	0.40%
1,053	351	59	86.70%	10.70%	2.60%	5,784	1,446	59	95.40%	3.70%	0.90%	6,020	1,204	59	68.60%	30.20%	1.20%
701	234	54	84.80%	12.00%	3.30%	4,437	1,109	52	95.50%	3.60%	0.90%	4,504	901	53	69.30%	29.40%	1.30%
217	72	37	85.80%	11.20%	3.00%	1,432	358	36	96.20%	3.00%	0.80%	1,589	318	36	75.40%	23.70%	1.00%
57	19	34	89.10%	8.40%	2.50%	281	70	34	95.70%	3.40%	0.90%	283	57	34	74.20%	24.70%	1.20%
1,605	535	52	84.20%	12.60%	3.20%	11,919	2,980	48	96.70%	2.60%	0.80%	13,795	2,759	49	71.60%	27.90%	0.90%
390	130	45	92.20%	6.80%	1.00%	4,019	1,005	44	99.10%	0.70%	0.20%	3,954	791	45	82.90%	17.00%	0.30%
235	78	27	78.30%	18.80%	2.90%	2,302	576	27	96.90%	2.60%	0.50%	3,294	659	27	74.10%	25.70%	0.50%
32	11	20	83.30%	15.00%	1.70%	357	89	20	98.20%	1.60%	0.30%	501	100	20	80.30%	19.60%	0.30%
1,154	385	56	83.40%	12.20%	4.40%	9,146	2,287	54	96.10%	3.00%	0.90%	8,654	1,731	55	70.40%	28.40%	1.50%
545	182	47	85.90%	12.00%	2.10%	4,632	1,158	46	97.70%	2.00%	0.30%	5,631	1,126	46	76.50%	23.10%	0.50%
152	51	33	87.20%	11.10%	1.60%	1,488	372	33	98.00%	1.70%	0.30%	1,849	370	33	82.20%	17.50%	0.40%
57	19	28	87.80%	10.80%	1.40%	484	121	28	98.00%	1.70%	0.30%	626	125	28	80.80%	19.00%	0.30%
1,164	388	56	86.60%	11.00%	2.40%	6,721	1,680	54	96.20%	3.10%	0.70%	8,029	1,606	55	72.30%	27.00%	0.90%
674	225	47	88.50%	10.00%	1.50%	4,258	1,065	46	97.30%	2.30%	0.40%	5,448	1,090	46	76.40%	23.20%	0.40%
203	68	31	88.10%	10.50%	1.40%	1,764	441	31	98.00%	1.60%	0.30%	2,324	465	31	83.10%	16.70%	0.30%
53	18	29	90.20%	8.70%	1.00%	491	123	28	98.60%	1.20%	0.20%	625	125	28	84.40%	15.50%	0.20%
2,262	754	59	90.90%	7.60%	1.50%	7,041	1,760	58	95.50%	3.80%	0.80%	9,318	1,864	58	66.80%	32.40%	0.90%
441	147	51	90.60%	7.80%	1.60%	2,512	628	49	96.90%	2.40%	0.70%	2,558	512	50	74.70%	24.60%	0.70%
183	61	36	91.60%	7.30%	1.10%	795	199	36	97.30%	2.20%	0.50%	1,077	215	36	78.00%	21.70%	0.40%
63	21	31	91.50%	7.70%	0.80%	529	132	31	98.80%	1.00%	0.20%	690	138	31	85.50%	14.30%	0.20%
687	229	60	86.40%	10.60%	3.10%	3,566	891	60	95.40%	3.60%	1.00%	4,092	818	60	70.90%	27.90%	1.20%
622	207	52	88.90%	8.00%	3.10%	4,412	1,103	49	96.80%	2.30%	0.80%	4,117	823	51	79.20%	19.70%	1.20%
168	56	38	87.90%	9.40%	2.60%	1,217	304	36	97.30%	2.10%	0.60%	1,329	266	36	80.20%	19.10%	0.80%
111	37	33	89.10%	8.90%	2.00%	705	176	32	97.20%	2.30%	0.50%	797	159	32	79.00%	20.30%	0.70%

PM Peak						Evening						
Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	**Total 24 HR Volume**
10,889	2,722	53	88.90%	10.60%	0.50%	6,584	823	56	86.80%	13.00%	0.50%	40,186
5,345	1,336	45	89.40%	10.10%	0.50%	4,181	523	50	87.20%	12.60%	0.40%	21,890
2,504	626	32	93.70%	6.10%	0.20%	1,301	163	33	91.60%	8.80%	0.30%	8,481
811	203	27	94.60%	5.20%	0.10%	387	48	28	92.80%	7.80%	0.10%	2,629
8,403	2,101	55	90.50%	9.10%	0.40%	4,938	617	58	88.20%	11.70%	0.40%	30,370
3,288	822	47	89.90%	9.80%	0.30%	2,218	277	52	87.30%	12.50%	0.30%	12,620
1,687	422	34	94.80%	5.00%	0.10%	845	106	35	93.10%	7.40%	0.10%	5,621
699	175	30	95.30%	4.60%	0.10%	359	45	31	93.50%	7.00%	0.10%	2,327
6,717	1,679	57	90.10%	9.30%	0.60%	3,958	495	58	87.80%	11.90%	0.60%	24,027
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1,690	423	34	93.80%	6.00%	0.10%	871	109	35	91.50%	8.90%	0.20%	5,684
373	93	33	94.50%	5.30%	0.20%	214	27	34	93.30%	6.90%	0.20%	1,305
6,343	1,586	59	88.80%	10.60%	0.60%	3,575	447	59	86.20%	13.50%	0.60%	22,775
4,747	1,187	52	89.20%	10.20%	0.60%	2,648	331	54	86.30%	13.30%	0.60%	17,037
1,598	400	35	90.90%	8.60%	0.50%	887	111	37	88.30%	11.50%	0.60%	5,723
290	72	34	90.20%	9.20%	0.60%	169	21	34	88.50%	11.10%	0.70%	1,080
13,205	3,301	47	89.40%	10.10%	0.50%	8,759	1,095	52	88.60%	11.90%	0.40%	49,283
4,681	1,170	44	95.00%	4.90%	0.10%	2,372	296	45	93.50%	7.00%	0.10%	15,416
2,944	736	27	89.70%	10.10%	0.30%	1,678	210	27	87.80%	13.40%	0.30%	10,453
496	124	20	92.70%	7.10%	0.20%	250	31	20	91.10%	10.40%	0.20%	1,636
9,397	2,349	53	90.00%	9.30%	0.70%	5,409	676	56	88.00%	11.80%	0.70%	33,760
5,524	1,381	45	92.50%	7.30%	0.20%	3,241	405	46	89.90%	10.40%	0.30%	19,573
1,843	461	33	93.60%	6.20%	0.20%	978	122	33	91.70%	8.80%	0.20%	6,310
617	154	28	93.00%	6.80%	0.20%	327	41	28	90.70%	9.70%	0.20%	2,111
7,764	1,941	53	89.70%	9.80%	0.50%	4,505	563	56	86.80%	13.10%	0.50%	28,183
5,389	1,347	46	91.20%	8.60%	0.30%	2,752	344	47	88.00%	12.20%	0.30%	18,521
2,324	581	31	93.70%	6.10%	0.20%	1,163	145	31	91.30%	9.20%	0.20%	7,778
634	158	28	94.50%	5.40%	0.10%	314	39	29	92.70%	7.90%	0.10%	2,117
8,326	2,081	57	86.70%	12.90%	0.50%	4,909	614	59	82.90%	16.70%	0.50%	31,856
2,873	718	48	91.40%	8.10%	0.50%	1,469	184	51	88.60%	11.40%	0.40%	9,853
1,005	251	36	91.50%	8.20%	0.30%	545	68	37	88.30%	11.90%	0.30%	3,605
694	174	31	94.70%	5.20%	0.10%	351	44	31	93.00%	7.60%	0.10%	2,327
4,099	1,025	60	89.20%	10.20%	0.60%	2,254	282	60	86.00%	13.50%	0.70%	14,698
4,808	1,202	49	93.10%	6.20%	0.70%	2,642	330	52	91.40%	8.30%	0.60%	16,601
1,391	348	36	93.10%	6.50%	0.40%	799	100	37	91.20%	8.70%	0.40%	4,904
828	207	32	92.30%	7.30%	0.40%	443	55	33	90.10%	9.80%	0.40%	2,884

						Early Morning						AM Peak							
Scenario	County Name	Facility Type Name	Miles	Average Free Flow Speed	Average # of Lanes	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume
2050; PBA 2050+ (16)	Alameda	Freeway	582	51	2	2,259	753	50	89.0%	8.1%	2.5%	9,042	2,260	49	95.3%	3.6%	1.1%	12,336	2,467
		Expressway	62	51	2	1,956	652	49	92.1%	6.0%	1.4%	6,813	1,703	42	97.2%	2.3%	0.5%	7,943	1,589
		Major arterial	908	27	2	255	85	27	87.5%	10.2%	2.3%	3,019	755	25	97.9%	1.8%	0.4%	2,782	556
		Collector	752	28	1	97	32	28	87.2%	11.0%	1.9%	1,327	332	26	98.3%	1.4%	0.3%	1,241	248
	Contra Costa	Freeway	394	51	2	1,490	497	51	86.3%	6.3%	2.4%	6,922	1,731	50	96.4%	2.8%	0.8%	9,127	1,825
		Expressway	89	54	1	989	330	51	93.1%	4.6%	1.2%	3,159	790	47	97.6%	2.0%	0.4%	3,464	693
		Major arterial	795	30	2	153	51	30	89.7%	8.4%	1.4%	2,103	526	28	98.2%	1.5%	0.3%	1,711	342
		Collector	705	31	1	85	28	31	89.8%	8.2%	1.3%	1,159	290	30	98.6%	1.2%	0.2%	922	184
	Marin	Freeway	157	52	2	916	305	52	63.3%	5.3%	2.8%	5,306	1,327	51	97.1%	2.2%	0.7%	5,802	1,160
		Expressway	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Major arterial	146	29	2	153	51	29	69.1%	6.7%	1.6%	1,753	438	28	98.4%	1.4%	0.2%	1,924	385
		Collector	382	34	1	51	17	34	77.6%	4.8%	1.3%	605	151	33	98.2%	1.5%	0.3%	433	87
	Napa	Freeway	31	51	2	1,186	395	51	60.1%	4.9%	2.1%	5,703	1,426	50	96.5%	2.6%	0.9%	6,091	1,218
		Expressway	37	54	2	869	290	54	67.1%	6.4%	2.5%	5,255	1,314	52	97.0%	2.4%	0.7%	4,937	987
		Major arterial	118	32	2	237	79	32	80.9%	7.8%	2.4%	1,480	370	30	96.8%	2.6%	0.7%	1,450	290
		Collector	354	35	1	73	24	34	90.9%	6.9%	2.2%	399	100	34	96.3%	2.8%	0.9%	341	68
	San Francisco	Freeway	71	48	3	1,907	636	48	86.1%	10.4%	3.0%	10,826	2,707	46	97.1%	2.1%	0.7%	16,264	3,253
		Expressway	4	45	3	486	162	45	93.4%	5.8%	0.8%	5,865	1,466	44	99.3%	0.6%	0.1%	4,605	921
		Major arterial	322	22	2	241	80	22	75.1%	20.5%	3.5%	2,372	593	21	95.8%	3.5%	0.7%	3,451	690
		Collector	303	20	1	65	22	20	81.4%	16.5%	2.1%	866	217	20	97.6%	2.0%	0.4%	1,013	203
	San Mateo	Freeway	304	50	2	1,498	499	50	87.0%	9.1%	3.8%	8,176	2,044	48	96.0%	2.9%	1.1%	9,656	1,931
		Expressway	29	47	2	753	251	46	86.8%	10.6%	2.6%	6,394	1,598	45	97.9%	1.8%	0.3%	6,858	1,372
		Major arterial	439	27	2	183	61	27	87.3%	10.7%	2.0%	2,698	675	25	98.0%	1.7%	0.3%	2,129	426
		Collector	548	29	1	84	28	28	87.1%	11.3%	1.7%	1,137	284	27	98.3%	1.5%	0.2%	951	190
	Santa Clara	Freeway	682	50	2	1,465	488	50	87.7%	9.8%	2.6%	6,135	1,534	49	95.9%	3.3%	0.9%	9,602	1,920
		Expressway	271	48	2	1,005	335	47	87.0%	11.2%	1.9%	7,657	1,914	43	97.2%	2.3%	0.4%	8,457	1,691
		Major arterial	1,169	25	2	224	75	25	86.6%	11.6%	1.8%	2,912	728	24	97.7%	1.9%	0.4%	2,815	563
		Collector	771	29	1	79	26	29	87.5%	11.0%	1.5%	974	243	28	98.1%	1.6%	0.3%	951	190
	Solano	Freeway	266	52	2	2,439	813	51	49.3%	4.1%	1.6%	6,743	1,686	51	95.3%	3.8%	0.9%	9,773	1,955
		Expressway	85	52	2	485	162	52	65.9%	5.8%	2.3%	3,203	801	50	96.7%	2.7%	0.6%	2,885	577
		Major arterial	470	32	1	212	71	31	68.9%	5.5%	1.1%	1,101	275	31	97.3%	2.2%	0.4%	1,163	233
		Collector	240	31	1	93	31	31	82.8%	6.5%	1.1%	813	203	30	98.3%	1.5%	0.3%	846	169
	Sonoma	Freeway	226	52	2	779	260	52	86.5%	5.2%	3.0%	3,106	777	52	95.2%	3.7%	1.1%	4,473	895
		Expressway	24	53	2	517	172	53	74.2%	4.1%	3.7%	3,921	980	51	96.8%	2.4%	0.8%	3,714	743
		Major arterial	581	33	1	190	63	32	85.4%	5.7%	2.6%	1,636	409	30	97.5%	2.0%	0.5%	1,390	278
		Collector	544	33	1	161	54	33	89.7%	6.2%	2.1%	1,009	252	31	97.2%	2.2%	0.6%	1,039	208

Midday				PM Peak						Evening						24 Hour Weighted Volume
Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Congested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	
48	74.8%	19.5%	1.1%	9,959	2,490	48	89.1%	10.2%	0.7%	7,953	994	50	90.1%	8.5%	0.6%	41,549
44	74.9%	21.7%	0.7%	7,696	1,924	39	91.8%	7.8%	0.4%	5,783	723	49	89.0%	10.2%	0.4%	30,191
26	82.6%	16.7%	0.6%	3,662	916	25	93.9%	5.9%	0.2%	1,537	192	27	92.7%	8.0%	0.3%	11,255
27	84.3%	15.2%	0.4%	1,598	400	25	94.5%	5.3%	0.2%	698	87	28	93.3%	7.6%	0.2%	4,961
51	65.8%	11.1%	1.0%	7,399	1,850	50	90.7%	8.8%	0.5%	5,863	733	51	88.2%	5.7%	0.5%	30,801
49	59.1%	17.1%	0.8%	3,406	852	47	90.4%	9.3%	0.3%	2,510	314	52	88.4%	7.5%	0.4%	13,528
29	81.4%	11.5%	0.3%	2,508	627	28	94.3%	5.6%	0.2%	949	119	30	93.5%	6.5%	0.2%	7,424
30	83.5%	11.1%	0.3%	1,353	338	29	94.8%	5.1%	0.1%	544	68	31	92.4%	6.4%	0.2%	4,063
51	41.0%	5.8%	1.1%	5,622	1,406	51	93.3%	6.1%	0.5%	4,110	514	52	79.5%	3.3%	0.5%	21,756
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
29	58.9%	8.8%	0.3%	2,209	552	28	94.2%	5.6%	0.1%	1,078	135	29	75.6%	4.8%	0.2%	7,117
34	66.7%	8.4%	0.4%	645	161	33	94.9%	4.9%	0.2%	305	38	34	75.6%	3.5%	0.2%	2,039
51	53.4%	8.3%	1.0%	6,115	1,529	50	92.1%	7.3%	0.6%	3,954	494	51	57.2%	5.9%	0.5%	23,049
53	50.5%	14.1%	1.0%	5,486	1,371	51	92.3%	7.2%	0.5%	3,248	406	54	55.8%	7.1%	0.5%	19,795
31	74.8%	18.8%	0.9%	1,677	419	30	92.5%	7.0%	0.5%	907	113	32	84.6%	8.5%	0.5%	5,751
34	76.5%	21.4%	1.1%	421	105	34	91.3%	8.1%	0.6%	222	28	34	90.8%	9.1%	0.6%	1,456
45	79.1%	13.9%	0.8%	11,497	2,874	45	91.9%	7.6%	0.5%	11,754	1,469	48	92.6%	7.9%	0.4%	52,248
45	84.9%	15.2%	0.2%	7,210	1,802	44	95.4%	4.5%	0.1%	2,882	360	45	95.0%	5.9%	0.1%	21,048
21	71.9%	21.1%	0.6%	3,148	787	21	87.7%	12.0%	0.4%	1,815	227	22	87.3%	13.2%	0.4%	11,027
20	79.0%	19.1%	0.3%	1,153	288	20	91.6%	8.2%	0.2%	542	68	20	91.0%	10.3%	0.2%	3,639
48	77.5%	21.5%	1.4%	8,240	2,060	48	91.2%	8.0%	0.8%	7,143	893	49	92.4%	7.8%	0.6%	34,713
46	79.1%	20.7%	0.6%	7,301	1,825	44	93.3%	6.5%	0.2%	4,497	562	46	92.2%	8.5%	0.3%	25,803
27	83.1%	16.6%	0.4%	3,058	764	25	94.0%	5.8%	0.2%	1,212	152	27	93.3%	7.5%	0.2%	9,280
28	82.0%	17.8%	0.3%	1,342	336	27	93.9%	5.9%	0.1%	553	69	28	92.3%	8.5%	0.2%	4,067
48	75.9%	23.5%	0.9%	7,087	1,772	48	90.0%	9.4%	0.6%	6,051	756	50	90.0%	10.2%	0.5%	30,340
44	77.4%	22.2%	0.5%	8,687	2,172	41	91.8%	8.0%	0.3%	4,867	608	47	89.6%	10.8%	0.3%	30,673
24	82.2%	17.4%	0.4%	3,659	915	23	93.2%	6.6%	0.2%	1,432	179	25	91.7%	9.0%	0.2%	11,042
28	83.2%	16.6%	0.3%	1,222	305	27	93.7%	6.2%	0.2%	505	63	29	92.5%	8.3%	0.2%	3,731
50	35.5%	16.0%	0.9%	7,980	1,995	50	86.6%	12.8%	0.6%	5,183	648	51	54.7%	8.9%	0.6%	32,118
51	44.9%	14.6%	1.1%	3,539	885	49	91.3%	8.3%	0.4%	1,654	207	52	64.9%	7.5%	0.5%	11,766
31	57.3%	14.8%	0.5%	1,343	336	30	91.4%	8.3%	0.3%	606	76	32	73.5%	9.3%	0.3%	4,425
31	67.5%	11.8%	0.3%	1,013	253	30	93.7%	6.1%	0.2%	455	57	31	88.9%	7.0%	0.2%	3,220
52	64.5%	12.1%	1.2%	3,559	890	52	89.5%	9.8%	0.7%	2,592	324	52	81.9%	6.1%	0.7%	14,509
52	77.5%	8.8%	1.4%	4,341	1,085	51	93.9%	5.5%	0.6%	2,403	300	52	87.1%	3.5%	0.6%	14,896
31	69.7%	10.5%	0.8%	1,823	456	30	93.7%	5.9%	0.4%	901	113	32	83.7%	5.1%	0.4%	5,940
32	66.3%	13.0%	0.8%	1,133	283	31	92.6%	7.0%	0.4%	618	77	33	90.3%	6.9%	0.4%	3,960

Scenario	County Name	Facility Type Name	Miles	Average Free Flow Speed	Average # of Lanes	Early Morning						AM Peak					
						Weighted Average Volume	Weighted Average Hourly Volume	Contgested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Contgested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks
2050; PBA 2050+ no project	Alameda	Freeway	567	56	2	2,512	837	56	87.9%	9.3%	2.8%	12,402	3,100	50	95.7%	3.5%	0.9%
		Expressway	57	52	2	1,986	662	49	92.7%	6.2%	1.2%	6,145	1,536	42	96.3%	3.0%	0.7%
		Major arterial	901	33	2	315	105	33	87.1%	10.5%	2.4%	2,909	727	31	97.7%	1.8%	0.5%
		Collector	751	28	1	79	26	28	88.2%	10.2%	1.6%	958	239	27	98.2%	1.5%	0.3%
	Contra Costa	Freeway	387	58	2	1,873	624	58	89.3%	8.4%	2.4%	10,323	2,581	52	96.8%	2.5%	0.7%
		Expressway	73	54	1	1,228	409	50	93.2%	5.3%	1.5%	4,202	1,051	45	97.7%	1.8%	0.4%
		Major arterial	783	35	2	199	66	35	90.5%	8.3%	1.2%	2,082	521	33	98.5%	1.2%	0.2%
		Collector	703	31	1	76	25	31	90.9%	8.0%	1.1%	881	220	30	98.9%	0.9%	0.2%
	Marin	Freeway	137	58	2	1,377	459	58	91.9%	5.7%	2.4%	4,635	1,159	57	96.1%	3.0%	0.9%
		Expressway	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Major arterial	132	35	2	682	227	34	96.1%	3.2%	0.7%	2,787	697	30	98.7%	1.1%	0.2%
		Collector	370	34	1	108	36	34	95.3%	3.9%	0.8%	619	155	33	98.4%	1.3%	0.3%
	Napa	Freeway	29	59	2	1,563	521	59	90.2%	7.8%	2.0%	8,742	2,186	53	96.4%	2.8%	0.8%
		Expressway	37	54	2	1,096	365	54	89.0%	8.5%	2.4%	6,357	1,589	50	96.4%	2.8%	0.7%
		Major arterial	113	37	2	279	93	37	89.1%	8.6%	2.2%	1,883	471	35	96.6%	2.7%	0.6%
		Collector	354	35	1	71	24	34	91.3%	6.9%	1.9%	416	104	33	96.3%	2.8%	0.9%
	San Francisco	Freeway	71	52	3	2,336	779	52	85.8%	11.1%	3.1%	16,419	4,105	44	96.9%	2.4%	0.7%
		Expressway	4	45	3	466	155	45	92.5%	6.3%	1.2%	5,430	1,357	44	99.1%	0.7%	0.2%
		Major arterial	317	27	2	369	123	27	79.7%	17.4%	2.9%	3,415	854	26	96.8%	2.7%	0.5%
		Collector	303	20	1	51	17	20	83.7%	14.4%	1.9%	588	147	20	98.1%	1.6%	0.3%
	San Mateo	Freeway	290	56	2	1,675	558	56	85.1%	10.6%	4.3%	12,245	3,061	50	96.1%	2.9%	1.0%
		Expressway	29	47	2	909	303	46	87.3%	10.3%	2.4%	6,854	1,713	44	97.7%	1.9%	0.4%
		Major arterial	439	33	2	230	77	33	87.9%	10.3%	1.8%	2,309	577	31	98.0%	1.7%	0.4%
		Collector	548	29	1	76	25	28	88.1%	10.4%	1.5%	753	188	28	98.2%	1.5%	0.3%
	Santa Clara	Freeway	667	56	2	1,754	585	56	88.9%	8.9%	2.2%	9,479	2,370	49	96.7%	2.6%	0.6%
		Expressway	267	48	2	953	318	47	88.5%	9.8%	1.7%	6,723	1,681	44	97.3%	2.2%	0.4%
		Major arterial	1,165	32	2	344	115	31	88.4%	9.9%	1.8%	3,327	832	29	98.0%	1.6%	0.4%
		Collector	762	29	1	81	27	29	90.0%	8.7%	1.3%	843	211	28	98.4%	1.3%	0.3%
	Solano	Freeway	264	59	2	2,631	877	59	90.9%	7.5%	1.6%	8,416	2,104	56	95.6%	3.6%	0.8%
		Expressway	73	52	2	461	154	51	88.7%	9.5%	1.8%	2,671	668	51	96.6%	2.7%	0.7%
		Major arterial	456	37	1	235	78	36	91.7%	7.2%	1.1%	1,053	263	36	97.3%	2.2%	0.5%
		Collector	238	31	1	80	27	31	91.7%	7.3%	0.9%	690	173	31	98.7%	1.1%	0.2%
	Sonoma	Freeway	220	60	2	848	283	60	85.1%	11.5%	3.4%	4,044	1,011	59	94.6%	4.3%	1.1%
		Expressway	11	50	2	785	262	50	88.3%	8.5%	3.2%	6,052	1,513	47	97.5%	1.8%	0.7%
		Major arterial	574	38	1	228	76	37	89.4%	8.3%	2.3%	1,560	390	35	97.6%	1.9%	0.5%
		Collector	543	33	1	149	50	33	89.9%	8.1%	2.0%	920	230	31	97.2%	2.2%	0.6%

Midday						PM Peak						Evening					
Weighted Average Volume	Weighted Average Hourly Volume	Contgested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Contgested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks	Weighted Average Volume	Weighted Average Hourly Volume	Contgested Speed (mph)	% Passenger Vehicles	% Small & Medium Trucks	% Heavy Trucks
13,616	2,723	53	72.0%	27.1%	1.2%	13,323	3,331	49	89.5%	9.9%	0.6%	8,995	1,124	56	89.1%	11.0%	0.6%
7,457	1,491	44	73.7%	25.7%	0.8%	7,059	1,765	39	89.8%	9.8%	0.4%	5,350	669	50	88.9%	11.0%	0.4%
3,439	688	31	82.4%	17.1%	0.5%	3,566	892	30	93.4%	6.3%	0.3%	1,901	238	33	92.4%	8.2%	0.3%
1,068	214	27	84.3%	15.4%	0.4%	1,157	289	26	94.3%	5.5%	0.2%	546	68	28	93.3%	7.5%	0.2%
10,691	2,138	56	74.5%	24.8%	1.0%	10,849	2,712	52	91.1%	8.5%	0.5%	7,322	915	58	90.6%	9.7%	0.5%
4,348	870	47	72.8%	26.5%	1.0%	4,515	1,129	44	90.8%	8.9%	0.3%	3,198	400	51	89.3%	10.7%	0.4%
2,192	438	34	85.2%	14.6%	0.3%	2,447	612	33	94.7%	5.1%	0.2%	1,242	155	35	94.0%	6.8%	0.2%
885	177	30	86.7%	13.2%	0.2%	1,031	258	30	95.4%	4.5%	0.1%	503	63	31	94.4%	6.4%	0.1%
4,840	968	58	76.1%	22.5%	1.6%	4,726	1,181	57	91.2%	8.2%	0.6%	4,340	542	58	93.1%	7.1%	0.6%
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3,260	652	31	87.6%	12.1%	0.3%	3,145	786	29	95.5%	4.3%	0.1%	2,576	322	33	96.6%	4.1%	0.1%
593	119	34	87.0%	12.9%	0.4%	664	166	33	95.1%	4.7%	0.2%	427	53	34	96.3%	4.4%	0.2%
7,896	1,579	58	73.4%	25.9%	1.0%	9,147	2,287	53	90.7%	8.8%	0.5%	4,870	609	59	89.4%	10.6%	0.5%
6,023	1,205	52	74.1%	25.0%	1.1%	6,589	1,647	50	90.8%	8.7%	0.5%	3,725	466	54	89.5%	10.5%	0.5%
1,873	375	35	78.1%	21.2%	0.8%	2,111	528	34	91.6%	8.0%	0.4%	1,088	136	37	90.9%	9.3%	0.4%
340	68	34	76.8%	22.5%	1.0%	419	105	34	91.3%	8.0%	0.6%	219	27	34	90.8%	9.1%	0.5%
18,383	3,677	47	75.2%	24.5%	0.9%	17,426	4,357	43	90.6%	8.9%	0.5%	13,005	1,626	51	91.2%	9.5%	0.4%
4,411	882	45	83.5%	16.5%	0.4%	6,167	1,542	44	95.3%	4.6%	0.1%	2,839	355	45	94.6%	6.2%	0.1%
4,630	926	26	74.5%	25.2%	0.6%	4,218	1,054	26	89.8%	9.9%	0.3%	2,559	320	27	88.7%	12.2%	0.3%
797	159	20	79.9%	19.9%	0.4%	787	197	20	92.7%	7.1%	0.2%	401	50	20	91.6%	9.5%	0.2%
11,169	2,234	54	73.5%	25.2%	1.6%	12,148	3,037	50	90.9%	8.4%	0.7%	7,734	967	56	90.5%	9.5%	0.7%
7,383	1,477	45	78.7%	20.8%	0.7%	7,457	1,864	43	93.1%	6.6%	0.3%	5,013	627	46	91.8%	8.6%	0.4%
2,620	524	32	83.5%	16.2%	0.4%	2,698	674	31	93.9%	5.9%	0.2%	1,510	189	33	93.2%	7.4%	0.2%
838	168	28	82.5%	17.4%	0.4%	895	224	27	93.6%	6.2%	0.2%	469	59	28	92.4%	8.3%	0.2%
10,593	2,119	53	75.9%	23.5%	0.9%	10,338	2,585	48	91.4%	8.1%	0.4%	7,038	880	56	90.5%	9.7%	0.4%
8,142	1,628	45	78.3%	21.3%	0.5%	7,892	1,973	43	91.7%	8.0%	0.3%	4,464	558	47	90.4%	10.0%	0.3%
3,848	770	30	83.9%	15.8%	0.4%	4,105	1,026	28	93.9%	5.9%	0.2%	2,126	266	31	92.9%	7.7%	0.2%
924	185	28	84.5%	15.4%	0.3%	1,039	260	27	94.5%	5.4%	0.2%	492	61	29	93.5%	7.3%	0.2%
10,570	2,114	57	67.7%	31.5%	0.9%	9,628	2,407	55	87.2%	12.3%	0.5%	5,770	721	59	84.1%	15.6%	0.6%
3,027	605	51	73.7%	25.5%	0.9%	3,147	787	50	90.5%	9.1%	0.4%	1,604	201	51	87.6%	12.5%	0.5%
1,354	271	35	77.9%	21.7%	0.5%	1,328	332	35	91.7%	8.0%	0.3%	711	89	36	88.6%	11.7%	0.3%
813	163	31	85.4%	14.5%	0.2%	884	221	30	94.5%	5.3%	0.1%	445	56	31	93.7%	7.1%	0.1%
4,882	976	60	69.9%	28.9%	1.3%	4,623	1,156	59	88.3%	11.0%	0.7%	2,767	346	60	85.7%	13.9%	0.8%
7,014	1,403	48	84.9%	14.3%	0.8%	6,974	1,744	46	94.2%	5.3%	0.4%	4,113	514	50	93.0%	7.0%	0.5%
1,655	331	36	81.3%	18.1%	0.7%	1,728	432	35	93.5%	6.2%	0.3%	1,013	127	37	92.1%	8.1%	0.4%
977	195	32	79.5%	19.8%	0.8%	1,029	257	31	92.5%	7.1%	0.4%	575	72	33	91.1%	9.1%	0.4%

Citation #	Citations	
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.	Caltrans Technical Noise Supplement. 2013 (September). Table (4-2), Pg 4-17.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.	Caltrans Technical Noise Supplement. 2013 (September). Equation (4-5), Pg 4-17.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.	FHWA 2004 TNM Version 2.5
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.	FHWA 2004 TNM Version 2.5
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.	Caltrans Technical Noise Supplement. 2013 (September). Equation (2-23), Pg 2-51, 52.
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9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.	FHWA 2004 TNM Version 2.5
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.	FHWA 2004 TNM Version 2.5
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.	FHWA 2004 TNM Version 2.5
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.	FHWA 2004 TNM Version 2.5
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67	
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69	
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69	

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California Department of Transportation (Caltrans). 2009 (November). Technical Noise Supplement. Available: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf. Accessed August 17, 2017.

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Distance Propagation Calculations for Stationary Sources of Ground Vibration

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

Table A. Propagation of vibration decibels (VdB) with distance

Noise Source	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (VdB)	@	distance (ft)	vibration level (VdB)	@	distance (ft)
Impact pile driver	112	@	25	71.8	@	545
Vibratory Roller	94		25	71.9	@	136

The Lv metric (VdB) is used to assess the likelihood for vibration to result in human annoyance.
The threshold applied is 72 VdB.

STEP 2B: Identify the vibration source and enter the reference peak particle velocity (PPV) and distance.

STEP 3B: Select the distance to the receiver.

Table B. Propagation of peak particle velocity (PPV) with distance

Noise Source	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (PPV)	@	distance (ft)	vibration level (PPV)	@	distance (ft)
Impact pile driver	0.644	@	25	0.197	@	55
Vibratory Roller	0.210	@	25	0.198	@	26

The PPV metric (in/sec) is used for assessing the likelihood for the potential of structural damage.
The threshold applied is 0.25 in/sec PPV.

Notes:

Computation of propagated vibration levels is based on the equations presented on pg. 185 of FTA 2018. Estimates of attenuated vibration levels do not account for reductions from intervening underground barriers or other underground structures of any type, or changes in soil type.

Federal Transit Association (FTA). 2018 (September). Transit Noise and Vibration Impact Assessment Manual. FTA Report No. 0123. Washington, D.C. Accessed: December 20, 2020. Page Available:

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