

**Appendix A**  
**PRIOR TECHNICAL STUDIES MEMORANDUM**



# Altamont Corridor

## Prior Studies Technical Memorandum



California High-Speed Rail Authority  
Contract HSR08-03  
Project 60092536, Task 0003, File Code 503



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## 1.0 Introduction and Purpose

The purpose of this literature review is to summarize the research conducted and relevant reports and studies that have been produced over the last decade regarding transportation improvements in the Altamont corridor in San Joaquin, Alameda and Santa Clara Counties in northern California. The references outlined in this review have been generated by a number of public and private entities. These include planning organizations at the metropolitan, county and municipal level, transportation service providers and planners, and research institutions, as outlined below.

### Planning organizations:

- Alameda County Congestion Management Agency
- Contra Costa (County) Transportation Authority
- Merced County Association of Governments
- Metropolitan Transportation Commission (nine-county Bay Area, including Alameda County)
- San Joaquin (County) Council of Governments
- San Mateo County Transportation Authority
- Stanislaus (County) Council of Governments
- City of Union City

### Transportation service providers and planners:

- Bay Area Rapid Transit District – operating and planning rapid transit service in five Bay Area counties, including Alameda and Santa Clara Counties
- California High-Speed Rail Authority – planning future statewide passenger rail service with potential stations in San Joaquin, Alameda and Santa Clara Counties
- Peninsula Corridor Joint Powers Board (Caltrain) – manages Caltrain commuter rail service between Santa Clara County and San Francisco
- San Joaquin Regional Rail Commission – operating Altamont Commuter Express (ACE) service connecting San Joaquin, Alameda, and Santa Clara Counties
- Santa Clara Valley Transportation Authority – operating and planning transit service in Santa Clara County

### Research institutions:

- Bay Area Council Economic Institute
- Public Policy Institute of California

The references are arranged below by the sponsoring entity, and a brief description of each agency, authority or institution is provided. Within each entity, references are listed in reverse chronological order along with their purpose and descriptions of their content. Additional references predating the last decade are listed at the end of the document.

## 2.0 Planning Organizations

### 2.1 Alameda Congestion Management Agency

The Alameda County Congestion Management Agency (CMA) was created in 1991 by a joint-powers agreement between Alameda County and the cities within the County. The CMA Board includes representatives from Alameda County, its cities, AC Transit and the Bay Area Rapid Transit District (BART). The CMA coordinates the efforts of local governments to address traffic congestion within the County, and develops and periodically updates the Alameda Countywide Transportation Plan. The CMA partnered with the San Joaquin Regional Rail Commission and the Santa Clara Valley Transportation Authority to implement the Altamont Commuter Express (ACE) service.

I-580 Eastbound HOV (Fact Sheet). Alameda County Congestion Management Agency, accessed 2009. <http://www.i580.info/projects/project.php?id=3>

This fact sheet describes the I-580 Eastbound HOV Lane Project, which is the first phase of a multi-phase Tri-Valley Implementation Plan sponsored by the CMA for the I-580, Route 84, and I-680 corridors. Pre-phases of the project and their sequencing are detailed. The project's objectives, schedule and cost estimates are given.

I-580 Altamont Pass-Truck Climbing Lane (Fact Sheet). Alameda County Congestion Management Agency, accessed 2009. <http://www.i580.info/projects/project.php?id=7>

This fact sheet describes the I-580 Eastbound Truck Climbing Lane Project, which is planned to alleviate congestion and enhance safety along the major route for the movement of goods from the Port of Oakland to the Central Valley. The relatively steep grade of I-580 in the eastbound direction adds to traffic congestion as slow moving trucks occupy the two right hand lanes, creating bottle-necks for faster moving vehicles. The project's objectives, schedule and cost estimates are given.

I-580 Advanced Right of Way Protection. Alameda County Congestion Management Agency, accessed 2009. <http://www.i580.info/projects/project.php?id=5>

This fact sheet describes the Advanced Right of Way Protection Project, which includes the development of a strategy to preserve the right-of-way required to implement mass transit in the I-580 corridor. The strategy also includes the relocation of existing utilities outside of the ultimate right-of-way. The ultimate right-of-way and its characteristics are described.

I-580 Westbound HOV Lane Project Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment. State of California Department of Transportation, March 2009. <http://www.accma.ca.gov/pages/HomeCorridorProjects.aspx>

This study considers the implementation of a westbound HOV lane along I-580 in eastern Alameda County and associated construction activities. In addition to this Build Alternative, a Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternative, a No-Build Alternative, as well as rejected alternatives are described. The

purpose and need for the project are discussed, and the affected environment, environmental consequences, and avoidance, minimization and mitigation measures associated with the project are examined.

Countywide Transportation Plan. Alameda County Congestion Management Agency, June 2008.

This plan is a long-range policy document that guides transportation decisions and articulates the vision for Alameda County's transportation system. The plan is periodically updated based on forecasted population growth and employment patterns. The Plan addresses freeways, buses, rail, ferries and non-motorized alternatives such as telecommuting, bicycling and pedestrian facilities. Through goals, objectives and strategies, the plan lays the groundwork for an investment program to meet the transportation needs of county residents, visitors and workers over a 25-year planning period. Funding sources for transportation projects are described and the county's capital investment program is outlined. The existing transportation system and its performance are presented, and strategies for managing the maintenance and operation of existing facilities are identified. The county's capital investment program is presented, including descriptions, sponsoring agencies and cost estimates for all committed projects.

## 2.2 Contra Costa Transportation Authority

The Contra Costa Transportation Authority manages the Contra Costa County's transportation sales tax program, conducts countywide transportation planning, and is the county's designated Congestion Management Agency. The County's Express Bus Study includes services in the Tri Valley and connecting to BART at the Dublin/Pleasanton Station.

Contra Costa Express Bus Study, Final Report. Contra Costa Transportation Authority, prepared by DKS Associates, December 2001.

This study describes an integrated express bus plan for Contra Costa County. Alternatives proposed in the study are organized into four primary corridors, including the Interstate 680 corridor connecting Contra Costa and Alameda Counties. For each corridor, existing services are described and new services are recommended. A three-phased vision for an express bus system is presented: initial improvements, a Basic Scenario, and an Enhanced Scenario.

## 2.3 Merced County Association of Governments

The Merced County Association of Governments (MCAG) is responsible for managing and implementing regional transportation, transit, and solid waste disposal services in Merced County, and provides a public forum for cross-jurisdictional issues. The eleven-member MCAG Governing Board includes a supervisor from each of five county districts and an elected official from each of the six incorporated cities located within the county.

San Joaquin Valley Express Transit Study Final Report. Merced County Association of Governments, prepared by Nelson\Nygaard Consulting Associates, May 2009.

This study identifies markets that can support inter-county commuter express transportation services within the San Joaquin Valley region, and between the San Joaquin Valley and its neighbors. Travel demand projections, existing services, and the characteristics of the San Joaquin Valley's communities are evaluated to determine the investments that will best serve the region's inter-county commuters. A full range of possible strategies for providing higher-capacity transportation choices for Valley commuters is considered.

For a majority of the region, investments in ridesharing are found to be the most cost-effective strategy for increasing inter-county commuter services. The study recommends that the region's existing inter-regional bus offerings be maintained to the extent possible. The study presents a long-term vision for the region that includes significant upgrades to commuter rail service, and recommends that such investments capitalize on California high-speed rail investments.

## 2.4 Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) was created by the California State Legislature in 1970 as the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. The Commission's work is guided by a nineteen-member policy board. MTC functions as both the regional transportation planning agency on the state level and as the region's Metropolitan Planning Organization (MPO) for federal purposes. It is responsible for regularly updating the *Regional Transportation Plan*, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle and pedestrian facilities. In 2001, MTC laid out the next phase of major regional public transit investments in Resolution 3434, featuring additional rail investment as well as a significant expansion of bus rapid transit and ferry service.

Transportation 2035 Plan Final Environmental Impact Report. Metropolitan Transportation Commission, prepared by Dyett & Bhatia, April 2009.

This report represents the transportation policy and action statement of the MTC to approach the Bay Area's transportation needs over the 25-year period following its release. It includes a set of future transportation projects and programs that can be implemented with available funding and identifies projects that could be considered if new funding is obtained. The report discloses the significant environmental effects of implementing the proposed Transportation 2035 Plan, identifies possible ways to minimize the significant effects, and describes reasonable alternatives to the proposed Transportation 2035 Plan. The four alternatives include: No Project, Heavy Maintenance/Climate Protection Emphasis, Heavy Maintenance/Climate Protection Emphasis + Pricing Strategies, and Heavy Maintenance/Climate Protection Emphasis + Land Use Strategies. The report includes responses to written and oral comments and recommendations received during a 45-day public review period.

Goods Movement Initiatives, 2009 Update. Metropolitan Transportation Commission, February 2009.

This paper is an update of the first *Regional Goods Movement Study* for the San Francisco Bay prepared by the MTC in 2004, focusing on regional efforts undertaken since that time. Information on two key initiatives is presented: the Trade Corridor Improvement Fund and implications of local land use decisions on the goods movement system. Additional efforts are also described: funding for goods movement programs, clean air initiatives, intraregional goods movement, and the West Coast Corridor Coalition.

Regional Rail Plan for the San Francisco Bay Area Final Report. Metropolitan Transportation Commission, September 2007.

This report presents a long-range vision for improving and expanding the Bay Area's passenger rail system to serve future travel demand. A system of passenger rail improvements and expansions is identified to guide investment decisions. The report discusses the importance of passenger and freight rail in the Bay Area; addresses the consequences of failing to address Bay Area rail needs; develops study alternatives and evaluation criteria; and presents recommended improvements for individual travel corridors. Recommendations for the region's future regional rail system are made, given contexts that include and do not include a statewide high-speed rail network. Land use, governance, and funding strategies that would support the regional rail system's development are discussed, and implementation considerations are identified. Specific follow-on efforts are recommended.

Transportation 2030 Plan Final Environmental Impact Report. Metropolitan Transportation Commission, prepared by Dyett & Bhatia, February 2005.

This report represents the transportation policy and action statement of the MTC to approach the Bay Area's transportation needs over the 25-year period following its release. It includes a set of future transportation projects and programs that can be implemented with available funding and identifies projects that could be considered if new funding is obtained. The report evaluates the impacts of the proposed Transportation 2030 Plan and five alternatives: No Project, Financially Constrained Transportation 2030 Plan Alternative, Financially Constrained Transportation 2030 Plan Plus Sales Tax Plan Alternative, and Financially Constrained Transportation 2030 Plan Plus High-Occupancy/Toll (HOT), and TRANSDEF Smart Growth Alternative. The report includes revisions and refinements based on written and oral comments and recommendations received during a 56-day public review period.

Regional Goods Movement Study for the San Francisco Bay Area, Final Summary Report. Metropolitan Transportation Commission, December 2004.

This study was commissioned to determine the economic significance of goods movement in the Bay Area and to inform decision-makers about the economic implications of policy decisions that affect goods movement. The study compiles data and information on the goods-movement system, evaluates the economic significance of goods movement, and analyzes land-use and goods-movement issues. It also identifies air quality issues related to goods movement, summarizes key goods movement issues, identifies project and policy options for the Transportation 2030 Plan and ongoing transportation planning, and evaluates regional goods movement and land-use issues and options. Specific infrastructure

projects are identified as part of the region's investment strategy and new planning programs are proposed.

2001 Regional Transportation Plan for the San Francisco Bay Area. Metropolitan Transportation Commission, November 2002 (amended).

This document specifies a detailed set of long-range investments and strategies to maintain, manage and improve the surface transportation network in the Bay Area with a horizon year of 2025. The plan introduces the Regional Transit Expansion Program (Resolution 3434), the Lifeline Transportation Program, the Transportation for Livable Communities / Housing Incentive Program, and the System Management Program. Travel demand data and projections are summarized and policy goals and objectives are presented. Transportation funding sources and investment strategies are identified. For each of sixteen multimodal travel corridors in the Bay Area, a description, a summary of specific management objectives, a map, and a list of projects according to their status are provided. Interregional gateways are also examined.

San Francisco Bay Crossings Study Final Report. Metropolitan Transportation Commission, July 2002.

The report updates the findings of a 1991 study, addressing the growth in transbay traffic and congestion in the intervening period. Six final alternatives, which arose out of a public outreach process, are defined and evaluated to determine their cost, travel, environmental and social impacts. Conclusions for each alternative are presented. The report recommends near-term improvements that could be funded from existing sources as well as from toll increases, and identifies areas for further study.

## 2.5 San Joaquin Council of Governments

The San Joaquin Council of Governments (SJCOG) is a Joint Powers Authority comprised of San Joaquin County and the seven cities located within the county. SJCOG fosters intergovernmental coordination within San Joaquin County and with neighboring jurisdictions, the state and various federal agencies. SJCOG serves as the regional transportation planning agency and a technical and informational resource for these jurisdictions. SJCOG prepares regional plans, programs, applications and studies, including the *Regional Transportation Plan*, which is updated every four years.

San Joaquin Valley National Agricultural Goods Movement Trade Corridor, Rail Program Concept Paper. San Joaquin Valley Regional Planning Agencies' Directors' Committee, October 2008.

This paper presents a comprehensive framework of various components to enhance goods movement and restore rail infrastructure in the San Joaquin Valley. The paper presents a vision for developing a national goods movement corridor in partnership with state and federal agencies as well as the private sector. The case for the efficient movement of goods by rail is made, both on an interstate level by long-haul rail and on a regional level by short-haul rail. Phasing, pilot projects, and market testing of the potential system are described,

and partnership opportunities and key stakeholders are presented. The paper suggests recommended actions and provides preliminary cost estimates.

San Joaquin Valley Regional Goods Movement Action Plan. Council of Fresno County Governments, Kern Council of Governments, Kings County Association of Governments, Madera County Transportation Commission, Merced County Association of Governments, San Joaquin Council of Governments, Stanislaus Council of Governments, and Tulare County Association of Governments, 2007.

This report describes the San Joaquin Valley goods movement system and the growth pressures facing the Valley. Trends affecting the goods movement system are outlined and a flow analysis of goods movement is presented. The impacts of goods movement on Valley air quality are discussed. The various corridor projects and strategies comprising the Strategic Action Plan for Goods Movement are described, including cost estimates. Challenges facing the Plan and recommended considerations are discussed.

California Inter-Regional Intermodal System (CIRIS) Implementation Plan, Final Report. San Joaquin Council of Governments, prepared by The Tioga Group, Inc., Railroad Industries, Inc., and Cambridge Systematics, Inc., June 2006.

This report develops and documents a plan for an inter-regional, intermodal rail service between the Port of Oakland and its Northern California hinterland. The report lays out a logical progression toward an on-going service, including a pilot/demonstration project, transloading at the Port of Stockton, system organization, service start-up, and long-term market extension. An examination of CIRIS economics and benefits, operating options, and implementation choices is included.

2007 Regional Transportation Plan. San Joaquin Council of Governments, May 2007.

This plan presents goals, policies, objectives and performance indicators for San Joaquin County's future transportation system. The existing transportation system is described, and an overview of the funding available for future investments is presented. The public outreach and interagency consultation process followed during the development of the Plan is discussed, and the environmental impacts associated with its implementation are described.

## 2.6 San Mateo County Transportation Authority

The San Mateo County Transportation Authority (SMCTA) is an independent agency formed to administer the proceeds of a countywide sales tax tied to a specific expenditure plan. The plan includes a broad spectrum of projects and programs, including Caltrain upgrades and improvements, highway and street projects, paratransit service and transportation systems management programs. The Transportation Authority is also a sponsoring agency of the Dumbarton Rail Corridor project to extend commuter rail service across the South Bay between the Peninsula and the East Bay.

Dumbarton Rail Corridor Environmental Phase 1, Final Report. San Mateo County Transportation Authority, Alameda County Transportation Improvement Authority, Metropolitan Transportation Commission, and Santa Clara Valley Transportation Authority, prepared by HNTB Corporation in cooperation with Cambridge Systematics, Inc., Jones & Stokes, and STV, Inc., March 2006.

This document is the Final Report for Environmental Phase 1 of the Dumbarton Rail Corridor Project, compiling three technical memoranda regarding alternatives development, project definition, and alternatives analysis. The most feasible rail and bus alternatives presented in the report will be carried forward into Environmental Phase 2, which will include a more detailed analysis for potential environmental impacts, the preparation of an Environmental Impact Report/Statement, and project preliminary engineering.

Dumbarton Rail Corridor Project Study Report. San Mateo County Transportation Authority, prepared by HNTB and Earth Tech, May 2004.

This report consists of a series of technical reports documenting the Dumbarton Rail Corridor project. The series of technical reports include conceptual engineering, environmental studies, and documents from the preliminary engineering and environmental phase. The report defines the study area, mobility issues, and travel needs, and establishes goals and objectives. A range of possible alternatives is developed to address mobility issues and travel needs. The report includes preliminary environmental evaluation, cost estimates and a project schedule.

## 2.7 Stanislaus Council of Governments

The Stanislaus Council of Governments (StanCOG) is a Joint Powers Authority of city and county governments created to serve as the regional transportation planning agency for Stanislaus County and the nine cities located within the County. StanCOG is also the federally recognized Metropolitan Planning Organization (MPO). StanCOG coordinates regional issues such as transportation, growth, air quality, project development, and the fiscal management of transportation funding from state and federal sources. StanCOG works with planning, public works, and transit officials in the preparation of long range transportation plans and in the development of transportation improvement programs that utilize state and federal funds.

Stanislaus County Transit Needs Assessment, Recommendations and Implementation Plan. Stanislaus Council of Governments, prepared by HDR Engineering, Inc., The Hoyt Company, IBI Group, and PMC, April 2009.

This study focuses on the mobility needs of seniors and persons with disabilities residing in Stanislaus County, and identifies feasible service strategies to effectively and efficiently meet these needs. The study finds needs that extend beyond the current fixed route and dial-a-ride services provided by public transit operators. It is recommended that StanCOG work with social service, non-profits and transit agencies to improve access to federal and state transit funds, and that a Transportation Advisory Committee be formed. A recommended implementation plan is presented, organized into three project areas.

Stanislaus County Non-Motorized Transportation Plan. Stanislaus Council of Governments, prepared by Alta Planning and Design, September 2008.

This plan guides the future development of bicycle and pedestrian facilities within Stanislaus County. The plan was developed to increase bicycle and pedestrian access, increase bicycle use, and increase pedestrian activity. Existing bicycling and pedestrian conditions are described, bicyclist and pedestrian needs are outlined, and infrastructure improvement and safety and education programs are recommended. An implementation strategy is provided, including a prioritization of projects and cost estimates.

2007 Regional Transportation Plan. Stanislaus Council of Governments, 2007.

This document provides a blueprint for future transportation improvements and investments in Stanislaus County, based on specific transportation goals, objectives, policies and strategies. The document updates previous versions of the regional transportation plan released in 2004 and 2001. All major transportation projects to be undertaken within the region through 2030 are identified. The plan examines regional trends, land use, and all modes of transportation in the county. Environmental quality, transportation finance and monitoring programs are considered.

Local Transportation Improvement Plan, 30-Year Countywide Transportation Financial Expenditure Plan. Stanislaus Council of Governments, June 2006.

This document contains the Expenditure Plan of the Stanislaus County Local Transportation Improvement Plan. The plan was developed to improve major transportation corridors in Stanislaus County and address local streets and road repairs. It seeks to reduce congestion on streets and highways, improve air quality, enhance the County's ability to secure state and federal funds, and improve mobility for transit commuters, the disabled and senior citizens. The principles guiding the allocation of local retail transactions and use tax revenues are presented, along with descriptions of the projects designated for funding.

Central Stanislaus Freight Study, Final Report. Stanislaus Council of Governments, prepared by Dowling Associates, Inc., August 2001.

This study analyzes goods movement in a focused industrial area of central Stanislaus County called the State Route (SR) 132 Job Center. This industrial area plays a major role in the economic development of the region, but its continued success may be limited by the difficulty of accessing and traveling through the area. The study explores opportunities for improving access and internal travel in the SR 132 Job Center. Recommendations, in the form of capacity and operational improvements, are ranked according to priority and grouped into short and long term implementation packages.

## 2.8 City of Union City

The Economic and Community Development Department (ECD) of the City of Union City facilitates and assists business growth in the city. The ECD leads the development of the Union City Intermodal Station Passenger Rail Project, an effort to create a transportation hub with

Amtrak Capitol Corridor and Dumbarton Rail service at the site of the existing Union City BART Station.

Union City Intermodal Station Passenger Rail Project, Final Environmental Impact Report. City of Union City Economic and Community Development Department, prepared by Jones & Stokes, February 2006.

This report presents responses to comments submitted by agencies, individuals, and organizations concerning the April 2005 Draft Environmental Impact Report (DEIR) and the October 2005 Partial Revision of the Draft Environmental Impact Report (PRDEIR) for the Union City Intermodal Station Passenger Rail Project. Revisions to the Draft EIR and Partial Revision of the Draft EIR are documented.

Union City Intermodal Station Passenger Rail Project, Partial Revision of the Draft Environmental Impact Report. City of Union City Economic and Community Development Department, prepared by Jones & Stokes, October 2005.

This document revises and replaces Chapter 3.8, *Noise and Vibration* of the April 2005 draft environmental impact report (DEIR) for the proposed Union City Intermodal Station Passenger Rail Project.

Union City Intermodal Station Passenger Rail Project, Draft Environmental Impact Report. City of Union City Economic and Community Development Department, prepared by Jones & Stokes, April 2005.

This report describes and provides an environmental analysis of the Union City Intermodal Station Passenger Rail Project. Areas of known controversy regarding the project are discussed, along with the results of the analysis of key issues, including noise and vibration, traffic and safety, and air and water quality. Descriptions of the alternatives considered and their impacts are provided, along with proposed mitigation measures.

## 3.0 Transportation Service Providers and Planners

### 3.1 Bay Area Rapid Transit District

In 1957, the California State Legislature formed the San Francisco Bay Area Rapid Transit District, charged with developing a transit connection between San Francisco and Oakland as part of a greater Bay Area network. Following voter approval in 1962, planning commenced on a 72-mile rapid transit system serving Alameda, Contra Costa and San Francisco Counties, which opened in 1972. In the 1990s, the original system was expanded, including service on a new line to Dublin/Pleasanton. An extension of this line to Livermore was first considered as part of BART's original long-term expansion plans, and is the subject of a current Program Environmental Impact Report (EIR) process.

I-580 Corridor Study Phase 2: Livermore/Amador Valley "Rapid Bus" Plan, Technical Supplement 4 . San Francisco Bay Area Rapid Transit District, prepared by Nelson\Nygaard Consulting Associates, October 2004.

This paper proposes a "rapid bus" network covering the cities of Dublin, Pleasanton and Livermore as a short-term option in advance of a future rail extension. Over the course of conducting outreach for extending rail service from the existing Dublin/Pleasanton BART station into Livermore, several elected officials and staff members sought additional information on express bus and Bus Rapid Transit (BRT) options for the Tri-Valley, which resulted in the preparation of the paper. It proposes taking advantage of a number of existing resources in the Livermore/Amador Valley to implement "rapid bus" services, outlines possible service characteristics and evaluates the resulting ridership and costs.

I-580 Corridor Transit Study: Phase 2 – Draft Final Report. San Francisco Bay Area Rapid Transit District, prepared by Nelson\Nygaard Consulting Associates, June 2003.

This study expands upon earlier efforts to plan a transit connection from BART's Dublin/Pleasanton station to Livermore. The study considers a larger study area, includes additional transit technologies, provides a more sensitive travel demand analysis, and focuses on specific travel markets in order to identify a cost-effective project. Four alternatives are analyzed: two options using "light" diesel multiple unit (DMU) technology; an option using "heavy" DMU technology; and a hybrid of a BART extension with BRT services. These alternatives are evaluated with respect to ridership, capital and annual operating and maintenance costs, and BART's System Expansion Criteria.

I-580/BART to Livermore Study, Final Report. Alameda County Congestion Management Agency and San Francisco Bay Area Rapid Transit District, prepared by Cambridge Systematics, Inc., July 2002.

This study evaluates a variety of alternatives for improving transit services in the I-580 corridor between the cities of Pleasanton and Livermore. The study compares the benefits and costs of extending BART, building a new DMU or light rail transit (LRT) system, implementing new express bus service, and expanding existing BART parking. The study examines current and projected future land uses, surveys existing and potential transit users, forecasts ridership, identifies environmental challenges, and develops capital and operating cost estimates. Interim transit strategies to improve corridor mobility and accessibility in the short term are also evaluated. The study incorporates an integrated transportation planning analysis, including the evaluation of the interactions of transportation with land use regulations, real estate markets, community and global economic forces, travel demand, market segment analysis, environmental initiatives, engineering challenges, and financial constraints.

### 3.2 California High-Speed Rail Authority

The California High-Speed Rail Authority (CHSRA) was created in 1996 as the successor to the Intercity High Speed Rail Commission, and has developed plans for a statewide high-speed rail network linking San Francisco and Sacramento with Los Angeles, Orange County and San Diego.

In 2007, after considering both the Altamont Pass and Pacheco Pass for the alignment between the Bay Area and the Central Valley, the Authority recommended the Pacheco Pass route. However, the Authority is pursuing a partnership with local and regional agencies and transit providers to develop a joint-use (high-speed rail and “regional rail”) infrastructure project in the Altamont Pass corridor.

Bay Area to Central Valley High-Speed Train (HST) Final Program Environmental Impact Report / Environmental Impact Statement (EIR/EIS). California High-Speed Rail Authority and Federal Railroad Administration (FRA), May 2008.

This report considers, describes, and summarizes the environmental impacts—at a programmatic level of analysis—of the proposed California HST system within the broad corridor between and including the Altamont Pass and Pacheco Pass. In the document, the CHSRA and the FRA have identified a preferred HST Network Alternative and general alignments, station locations, mitigation strategies, design practices, and further measures to guide the system’s development and avoid and minimize potential adverse environmental impacts. The Final Program EIR/EIS was prepared to comply with two primary environmental laws: the federal National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The report explains why the project is proposed and provides a history of the planning process for the HST project. The proposed HST network, alignment alternatives and station location options are described. The findings of the analysis of potential environmental impacts are provided, along with mitigation strategies to reduce these impacts. The estimated capital and operations and maintenance costs for each HST alignment alternative are summarized. An analysis of the potential growth-inducing effects and related indirect impacts of the alternatives considered in the Program EIR/EIS are presented. The general principles and implementation approaches for HST station area development are described. The physical and operational characteristics and potential environmental consequences associated with different combinations of alignment alternatives that comprise the HST network are summarized. The Authority and FRA’s preferred HST network and alignment alternatives and station location options are described. Potentially significant adverse environmental effects that cannot be avoided should the proposed HST network alternative be implemented, and any unavoidable adverse impacts of the alternatives, are also disclosed. The report also contains summaries of coordination and outreach activities, identifies entities conferred with during the preparation of the report, and provides extensive reference material.

Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study, Ridership and Revenue Forecasts. Metropolitan Transportation Commission and California High-Speed Rail Authority, prepared by Cambridge Systematics, Inc., August 2007.

This report documents and analyzes the 2030 ridership for the set of high-speed rail alignment and network alternatives compared in the Draft Bay Area to Central Valley High Speed Train Program Environmental Impact Report/Environmental Impact Statement (DEIR/S) published in July 2007. The report analyzes the overall HST system and specific travel markets served by high-speed rail in terms of geography, original travel mode,

and trip purpose using each of the Altamont and Pacheco alignments as a base. The results from several sensitivity tests that were conducted to examine the effects of different level of service and cost assumptions are described. An overview of the results from all the network and alignment alternatives is provided, as well as detailed output from 37 modeled alternatives.

Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study, Final Report. Metropolitan Transportation Commission and California High-Speed Rail Authority, prepared by Cambridge Systematics, Inc., July 2007.

This report includes an overview of the model system developed to support evaluation of the California HST network alternatives. The report provides a summary of the data collection; descriptions of the modal networks; an overview of the model development by component, along with model validation and 2030 no-project forecasts; forecast assumptions by mode; ridership and revenue forecasts; the peer review panel; and a summary of the forecasting process and potential model improvements. Data sources include travel surveys, ridership counts, and traffic volumes. Model components include trip frequency, destination choice, mode choice, and trip assignment models.

Economic Growth Effects Analysis for the Bay Area to Central Valley Program-Level Environmental Impact Report and Tier 1 Environmental Impact Statement, Final Report. California High-Speed Rail Authority, prepared by Cambridge Systematics, Inc., July 2007.

This report focuses on the analysis of economic impacts and economic growth associated with the proposed California high-speed rail network. The report specifies the sub-state REMI economic growth model; develops and applies a system for evaluating and forecasting county-level business attraction impacts, along and accompanying changes in county-level employment and population; and reviews methods for applying the county-level analysis to develop finer-level forecasts of station area land development impacts. The analysis examines how high speed rail would change the pattern of accessibility for commuting, business-related travel and tourism travel and thus lead to changes in effective labor markets, business location and business delivery markets.

California High-Speed Train Program EIR/EIS, Bay Area-to-Merced Corridor High-Speed Train Alignments/Stations Screening Evaluation. California High Speed Rail Authority and Federal Railroad Administration, prepared by Parsons Transportation Group, Earth Tech, Inc., and Geotechnical Consultants, Inc., August 2001.

This report evaluates all reasonable and practical high-speed train alignment and station options within the Bay Area-to-Merced corridor at a consistent level of analysis. The report focuses the Program EIR/EIS on those alignment and station options that best attain a set of objectives established by the CHSRA. This alignment and station screening evaluation is accomplished through confirmation and reconsideration of prior alignment and station decisions based on review of previous studies; identification of alignment and station options not previously evaluated through meetings with elected officials and public agencies and through the environmental scoping process; evaluation of alignment and station options using standardized engineering, environmental, and financial criteria and evaluation

methodologies; and identification of the alignment and station options in attainment of the defined objectives.

California High-Speed Rail Corridor Evaluation Final Report. California High Speed Rail Authority, prepared by Parsons Brinckerhoff, December 1999.

This study assesses the viability of various corridors for implementation as part of the California high-speed rail system. The corridors are evaluated on the basis of capital, operating and maintenance costs, travel times and engineering, and operational and environmental constraints. The corridors are compared and evaluated on a regional basis and as part of a statewide system. The findings of this corridor evaluation study provide a basis for ridership, revenue and financial studies. The system of corridors developed also provides a basis for preparing an environmental impact statement and impact report for comparison of alternatives.

### 3.3 Peninsula Corridor Joint Powers Board

The Peninsula Corridor Joint Powers Board manages the Caltrain commuter rail line between Santa Clara County and San Francisco. The Board consists of three member agencies from the three counties served by Caltrain: City and County of San Francisco, San Mateo County Transit District, and Santa Clara Valley Transportation Authority. The Joint Powers Board is also a sponsoring agency of the Dumbarton Rail Corridor project to extend commuter rail service across the South Bay between the Peninsula and the East Bay.

Dumbarton Rail Corridor Project Environmental Scoping Report. Federal Transit Administration and Peninsula Corridor Joint Powers Board, prepared by Moore Iacofano Goltsman, Inc. in cooperation with Parsons Transportation Group, March 2007.

This report documents the scoping process conducted by the Peninsula Corridor Joint Powers Board and the Federal Transit Administration in the preparation of an Environmental Impact Statement / Environmental Impact Report (EIS/EIR) for the Dumbarton Rail Corridor Project. The process included scoping meetings at which the proposed project was presented to the public. The report summarizes the major comments received during each meeting as well as comments received after the meetings.

### 3.4 San Joaquin Regional Rail Commission

The San Joaquin Regional Rail Commission owns, operates, and is the policy-making body for the Altamont Commuter Express (ACE). The Rail Commission is governed by a Board of Directors, which is appointed by the San Joaquin Council of Governments from nominations by local agencies. ACE was established primarily to serve San Joaquin County residents commuting to jobs in Santa Clara County, and began service in 1998. Four roundtrips are operated each weekday between Stockton and San Jose with coaches propelled by diesel locomotives. Service is limited by freight traffic using the same tracks, and capacity constraints are the subject of ongoing study and planning. Service expansions toward Modesto, Sacramento and Pittsburg are also under exploration.

ACE Rail Passenger Survey 2007. San Joaquin Regional Rail Commission, prepared by Quality Resource Associates, November 2007.

This report presents data collected during an on-board survey of ACE passengers in September and October 2007, and provides an analysis of the survey's findings. The overall objectives of the study are to assess riders' overall impressions of ACE rail service; measure riders' perceptions of related services such as shuttles, special programs, and special events services; and to identify areas of strength and opportunities for improvement. A profile of ACE ridership is given as well as a summary of comments collected by the survey.

ACE Service Expansion Study, Central Valley Corridor, Merced-Stockton-Sacramento, Preliminary Analysis, Executive Summary. San Joaquin Regional Rail Commission, October 2007.

This document examines the prospects, possibilities and potential benefits of expanding the existing ACE system from Merced through Stockton to Sacramento. The access to existing rail lines is explored, and capacity improvements that may be required are outlined. Items required and next steps in the study process are discussed, including estimates of capital cost and operating expenses and of ridership potential.

ACE Corridor Analysis Study, Final Report. San Joaquin Regional Rail Commission, prepared by HDR Engineering, Inc., August 2007.

This study examines opportunities for improvement of ACE's existing corridor from Stockton to San Jose and the development of three Action Plans: a Short Term Action Plan, with a five-year horizon; a Long Term Action Plan, with a ten-year horizon; and a Connections Action Plan. The study examines the following opportunities: negotiation of improved trackage rights or other considerations that will improve reliability and decrease travel times; the purchase, use and upgrade of existing active or abandoned rail lines within the ACE corridor; the construction of dedicated ACE trackage parallel to existing rail lines; other improvements that support increasing service, higher speeds and improved reliability; rolling stock options; actions required to create a direct ACE-BART connection at Pleasanton; and improvements to connecting services.

Draft Short Range Transit Plan. San Joaquin Regional Rail Commission, August 2007.

This plan is a guide for the development and service expansion of ACE over the ten-year period following its release. The plan seeks to increase overall ACE ridership through a series of projects aimed to improve on-time performance, streamline support functions, expand connectivity and improve safety and security. The plan documents and assesses the financial capacity of ACE to fund the projects aimed to meet these goals.

The plan emphasizes the purchase of a publicly-owned alignment through the Altamont Pass and improvement projects such as tunnel rehabilitation and shoe-fly replacement that will reduce travel times and improve on-time performance. Improvements at the ACE stations, securing shuttle funding and additional means of moving riders to and from job sites are considered to expand the connectivity of ACE.

### 3.5 Santa Clara Valley Transportation Authority

The Santa Clara Valley Transportation Authority (VTA) is responsible for operating and maintaining public transit services, congestion management, highway improvement projects, and countywide transportation planning in Santa Clara County. VTA is a member agency of the Peninsula Corridor Joint Powers Board and of the Capitol Corridor Joint Powers Authority, which manage the Caltrain commuter rail line and Capitol Corridor rail service, respectively. VTA is also a party in a Cooperative Services Agreement with the San Joaquin Regional Rail Commission and the Alameda County Congestion Management Agency to fund the operations and capital projects of the Altamont Commuter Express service.

Silicon Valley Rapid Transit Project Diridon/Arena Station Profile, Draft Station Campus Access Study. Santa Clara Valley Transportation Authority, prepared by Kimley-Horn and Associates, Inc., July 2009.

This study provides a description of the future Diridon/Arena BART Station location and its land use context, access and circulation. It provides an estimate of station ridership and the resulting requirements for access modes and parking. Key access considerations are named and station layout alternatives are proposed.

Silicon Valley Rapid Transit Corridor, Draft Environmental Impact Statement and Draft Section 4(f) Evaluation. Santa Clara Valley Transportation Authority, March 2009.

This document follows the previous Environmental Impact Report (EIR) and Supplemental Environmental Impact Report (SEIR) prepared for the BART Extension Project to Milpitas, San Jose, and Santa Clara. This Environmental Impact Statement (EIS) includes three alternative projects, and evaluates and discloses the environmental effects of each: the No Build Project, the Silicon Valley Rapid Transit Project (SVRTP), which is similar to the project included in the EIR and SEIR, and the Berryessa Extension Project (BEP). Topics of concern include traffic, air quality, biological resources, cultural resources, and noise and vibration, and mitigation measures to reduce or avoid adverse effects are identified.

Silicon Valley Rapid Transit Corridor, BART Extension to Milpitas, San Jose and Santa Clara, Final Supplemental Environmental Impact Report. Santa Clara Valley Transportation Authority, May 2007.

This report updates information presented in the *Silicon Valley Rapid Transit Corridor - BART Extension to Milpitas, San Jose and Santa Clara - Final Environmental Impact Report (FEIR)*, November 2004. The report evaluates potential environmental impacts of the BART extension project, including increases in localized traffic; increases in noise and vibration levels; relocation of businesses and residences; and impacts on wetlands, special status species, and historic and cultural resources, among other topics, that result from design modifications to the project previously evaluated in the 2004 FEIR. The report also covers new information regarding the project since certification of the 2004 FEIR.

## 4.0 Research Institutions

### 4.1 Bay Area Council Economic Institute

The Bay Area Council Economic Institute is a public-private partnership of business, labor, government and higher education that works to support the economic vitality and competitiveness of California and the Bay Area. The Bay Area Council and the Association of Bay Area Governments (ABAG) are its leading institutional partners. Through its economic and policy research and partnerships, the Economic Institute addresses major issues impacting the competitiveness, economic development and quality of life of the region and the state, including infrastructure, globalization, science and innovation, and governance.

California High-Speed Rail: Economic Benefits and Impacts in the San Francisco Bay Area. Bay Area Council Economic Institute, October 2008.

This report analyzes the potential benefits and impacts of the proposed California high-speed rail project, which are organized into four categories: business, employment and commercial impacts; mobility and congestion relief; urban development, land use and quality of life; and environmental considerations. Benefits and impacts focus on a horizon year of 2030. The appendix includes ridership and mode share forecasts.

### 4.2 Public Policy Institute of California

The Public Policy Institute of California (PPIC) is a nonprofit, nonpartisan think tank founded in 1994 to inform and improve public policy in California. The Institute conducts independent and objective research, performed by a multidisciplinary staff including experts in economics, demography, political science, sociology, and environmental resources. Within the policy area of transportation, the Institute focuses on regional transportation planning, air quality goals, and climate change. Other research areas include transportation investment needs and funding sources.

Urban Development Futures in the San Joaquin Valley. Public Policy Institute of California, 2005.

This study explores the likely scale, extent and pattern of urban growth in the San Joaquin Valley through 2040. It is intended to help policymakers and the public assess the significance and implications of growth and to consider whether policy changes are merited. Varying scenarios are explored to forecast how growth patterns might change as a result of public policy. A model is used to project urban growth, both its scale and location, and to consider the potential effects of changes in factors that affect urban growth. Four broad scenarios are examined: Accommodating Urban Development, Prime Farmland Conservation, High-Speed Rail, and Automobile-Oriented Managed Growth. Conclusions are drawn based on the model results, and implications for urban development policy are outlined.

## 5.0 Additional References

The following documents, dating mostly from the 1980s and 1990s, have provided a basis for many of the reports and studies previously referenced.

Altamont Pass Commuter Survey. San Joaquin Council of Governments and San Joaquin Partnership, prepared by Systan, Inc., October 2000.

Altamont Pass Interregional Corridor Study: Operational Analysis – Current and Future Transportation Conditions. Metropolitan Transportation Commission, prepared by DKS Associates, July 1995.

Altamont Pass Interregional Corridor Study: Operational Analysis – Evaluation. Metropolitan Transportation Commission, prepared by DKS Associates, November 1995.

Altamont Pass Interregional Corridor Study: Operational Analysis – Final Report. Metropolitan Transportation Commission, prepared by DKS Associates, November 1995.

Altamont Interregional Corridor Transportation Study, Final Report. Metropolitan Transportation Commission, October 1996.

Altamont Pass Passenger Rail Corridor Study. San Joaquin County Council of Governments, prepared by Parsons De Leuw, Inc., November 1993.

Candidate High Speed Rail Stations and Intermodal Connectivity. California Intercity High Speed Rail Commission, prepared by Sharon Greene and Associates, March 1996.

Dumbarton Commuter Service Feasibility Study. San Mateo County Transportation Authority, prepared by Parsons Brinckerhoff, 1991.

Dumbarton Corridor Rehabilitation. San Mateo County Transportation Authority, prepared by Morrison Knudsen, 1996.

Dumbarton Corridor Study. San Mateo County Transportation Authority, prepared by Parsons Brinckerhoff, 1998.

Dumbarton Passenger Rail Preliminary Project Study Report. San Mateo County Transportation Authority, 2002.

Dumbarton Rail Corridor Study Service Plan Evaluations, San Mateo County Transportation Authority, prepared by Parsons Transportation Group, 1999.

A Final Report to the California Legislature: High Speed Rail for the California Corridor, Opportunities and Strategies. Los Angeles-Fresno-Bay Area/Sacramento High-Speed Rail Corridor Study Group, June 1990.

- High-speed Trains for California: Detailed Segment Descriptions, Cost Estimates, and Travel Time Calculations. University of California at Berkeley, Institute of Urban and Regional Development, June 1992.
- High-speed Trains for California: Strategic Choice – Comparison of Technologies and Choice of Route. University of California at Berkeley, Institute of Urban and Regional Development, June 1992.
- Livermore/Amador Valley Rail Alternatives Study, Final Report. Livermore/Amador Valley Transit Authority and Bay Area Rapid Transit District, December 1987.
- Livermore-Pleasanton BART Extension Study, Final Report. San Francisco Bay Area Rapid Transit District, prepared by Livingston and Blayney, De Leuw, Cather & Company, July 1976.
- Livermore-Pleasanton Extension Study: Supplemental Analysis, Interim Report: System Conceptual Design. San Francisco Bay Area Rapid Transit District, prepared by De Leuw, Cather & Co. in association with DKS Associates, October 1985.
- Livermore-Pleasanton Extension Study: Supplemental Analysis, Final Report. San Francisco Bay Area Rapid Transit District, February 1986.
- Livermore-Pleasanton Extension Study: Update Analysis, Final Report. San Francisco Bay Area Rapid Transit District, December 1983.
- Los Angeles-Fresno-Bay Area/Sacramento High-Speed Rail Corridor Study, Draft Final Report. Los Angeles-Fresno-Bay Area/Sacramento High Speed Rail Corridor Study Group, prepared by Parsons Brinckerhoff Quade & Douglas, Inc., March 1990.
- Potential for Improved Intercity Passenger Rail Service in California: Study of Corridors. University of California at Berkeley, Institute of Urban and Regional Development, March 1994.
- San Joaquin Regional Rail Commission Altamont Commuter Rail Service: Follow-up Survey of Area Residents and Potential Riders, Final Report. San Joaquin Regional Rail Commission, prepared by J.D. Franz Research, 1996.
- San Joaquin Regional Rail Commission Altamont Commuter Rail Service: Commuter and General Public Focus Groups, Final Report. San Joaquin Regional Rail Commission, prepared by J.D. Franz Research, 1995.
- Stanislaus County Regional Expressway Study. Stanislaus Area Association of Governments, prepared by Fehr & Peers Associates, June 1990.



**Appendix B**  
**ALIGNMENT ALTERNATIVE SEGMENTS**



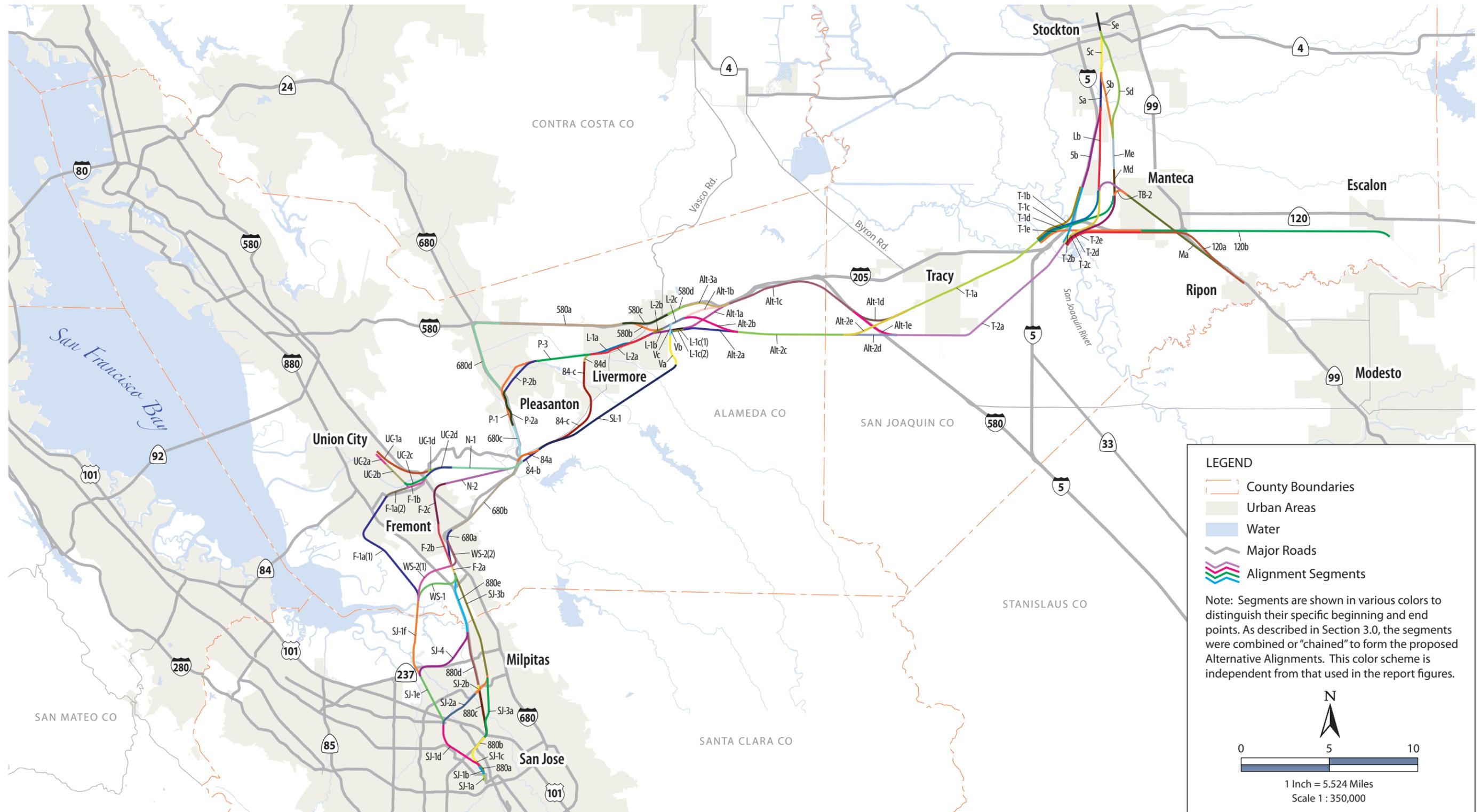
**Table B-1  
Description of Alignment Alternative Segments**

Segment	Segment Description	Station
<b>San Jose to Fremont (Area 1.1)</b>		
880a	Santa Clara Street to Taylor Street	
880b	Taylor Street to I-880/US 101	
880c	I-880/US 101 to north of I-880/Montague Expressway	
880d	North of I-880/Montague Expressway to south of I-880/Dixon Landing Road	Tasman/I-880
880e	South of I-880/Dixon Landing Road to Warm Springs Boulevard north of Mission Boulevard (SR 262)	
F-1a (1)	Adjacent to UPRR Coast Subdivision from north of Mud Slough to UP Centerville Line to Fremont Centerville ACE Station	Fremont Centerville ACE
F-2a	Warm Springs Boulevard north of Mission Boulevard to Warm Springs BART	Warm Springs BART
SJ-1a	San Jose Diridon to Santa Clara Street	San Jose Diridon
SJ-1b	Santa Clara Street to Hedding Street	
SJ-1c	SJ-1b to I-880b Connector	
SJ-1d	Hedding Street to Central Expressway adjacent to UP Coast Subdivision	Santa Clara
SJ-1e	Central Expressway to SR 237 adjacent to UP Coast Subdivision	Great America
SJ-1f	SR 237 to north of Mud Slough adjacent to UP Coast Subdivision	
SJ-2a	Central Expressway across US 101 to Trimble north to McCarthy Boulevard	First Street/Trimble
SJ-2b	Connects SJ-2a and I-880d	
SJ-2c	Montague Expressway west of I-880 to Vicinity of UPRR at Great Mall Parkway	
SJ-3a	North of I-880/Montague Expressway to Vicinity of UPRR at Great Mall Parkway adjacent to UP Warm Springs Subdivision	
SJ-3b	Vicinity of UPRR at Great Mall Parkway to Warm Springs Boulevard north of Mission Boulevard adjacent to UP Warm Springs Subdivision	Tasman/Great Mall
SJ-4	Tasman Drive to south of I-880/Dixon Landing Road	
UC-2d	Vicinity of Niles Junction to tunnel portal east of Niles Junction	
WS-1	UPRR Coast Subdivision north of Mud Slough to Warm Springs Boulevard south of Grimmer	
WS-2(1)	UPRR Coast Subdivision north of Mud Slough to Warm Springs BART south of Cushing	Warm Springs BART
WS-2(2)	Warm Springs BART to I-680 north of Durham Road	Warm Springs BART
<b>Fremont to I-680/SR 84 (Area 1.2)</b>		
680a	Warm Springs BART to I-680 north of Durham Road	Warm Springs BART
680b	I-680 north of Durham Road to west of I-680/SR 84	I-680/SR 84
F-1a (2)	Adjacent to UPRR Centerville Line from Fremont Centerville ACE Station to east of Paseo Padre Parkway	Fremont Centerville ACE
F-1b	East of Paseo Padre Parkway to Vicinity of Niles Junction	
F-2b	Warm Springs BART to North of Driscoll adjacent to UP Warm Springs Subdivision	Warm Springs BART
F-2c	North of Driscoll Road to Stevenson Blvd. adjacent to UP Warm Springs Subdivision	
N-2	Middle Tunnel from Stevenson Blvd. (Fremont) I-680/SR 84 (Sunol)	I-680/SR 84
<b>Union City to I-680/SR 84 (Area 1.3)</b>		
N-1	East of Niles Junction to I-680/SR-84	
UC-1a	Union City BART to near Niles Junction via UP Niles Subdivision	Union City Intermodal
UC-1d	Niles Junction to tunnel portal east of Niles Junction	
UC-2a	Union City BART to Alvarado Niles Road via UP Oakland Subdivision	Union City Intermodal
UC-2b	UP Oakland Subdivision from Alvarado Niles Road to Alameda Creek	
UC-2c	UP Oakland Subdivision from Alameda Creek to Niles Junction	
UC-2d	Niles Junction to tunnel portal east of Niles Junction	
<b>Tri-Valley (Area 2)</b>		
580a	I-580 at Dublin/Pleasanton BART to I-580 east of North Livermore Avenue	Isabel/I-580
580c	I-580 East of North Livermore Avenue to I-580 east of Vasco Road	

Segment	Segment Description	Station
580d	I-580 East of Vasco Road to I-580 at Greenville Road	
680c	I-680/SR 84 Junction to I-680 south of Sunol Boulevard	I-680/SR-84
680d	I-680 South of Sunol Boulevard to I-580 at Dublin/Pleasanton BART	Bernal/I-680 Dublin/Pleasanton BART
84a	West of I-680 to SR 84	I-680/SR 84
84b	East of I-680 to SR 84	I-680/SR 84
84c	East of I-680/SR 84 to south of Stanley Boulevard, along SR 84	
84d	Connects 84c to L-1a/L-2a	
L-1a (1)	Stanley Boulevard east of Isabel Avenue to Las Positas Road north of UP (Aerial)	Downtown Livermore
L-1a (2)	Stanley Boulevard east of Isabel Avenue to Las Positas Road north of UP (Tunnel)	
L-1b	Las Positas Road to Vasco Road north of UP	Vasco Road (UP)
L-1c (1)	East of Vasco Road to Greenville Road via north of UP	Vasco Road (UP)
L-1c (2)	East of Vasco Road to Greenville Road via south of UP	Vasco Road (UP)
L-2a	West of Murrieta Avenue to Contractor's Street via Railroad Avenue (Tunnel)	
L-2b	Las Positas Road to Vasco Road via former SP	Vasco Road (SP)
L-2c	Vasco Road to Greenville Road via former SP	Vasco Road (SP)
P-1	I-680 south of Sunol Boulevard to Valley Avenue (via UP)	Downtown Pleasanton (UP)
P-2a	I-680 south of Sunol Boulevard to north of Sunol Boulevard on former SP	
P-2b (1)	North of Sunol Boulevard to Stanley Boulevard via former SP (Aerial)	Downtown Pleasanton (SP)
P-2b (2)	North of Sunol Boulevard to Stanley Boulevard via former SP (Tunnel)	Downtown Pleasanton (SP)
P-3	Along Stanley Boulevard from Valley Avenue to east of Isabel Avenue	
SL-1	East of I-680/SR 84 to East of Vasco Road along power line alignment	
Va	East of Vasco Road to East of Vasco Road at Patterson Pass Road	
Vb	East of Vasco Road at Patterson Pass Road to north of UP	Vasco Road (UP)
Vc	East of Vasco Road at Patterson Pass Road to former SP	Vasco Road (SP)
<b>Altamont Pass (Area 3)</b>		
ALT-1a	North of UP at Greenville Road to North Flynn Road	
ALT-1b	Former SP at Greenville Road to North Flynn Road	
ALT-1c	I-580 at North Flynn Road to North of Via Nicolo Road	
ALT-1d	North of Via Nicolo Road to east of Delta Mendota Canal (to T-1a)	
ALT-1e	North of Via Nicolo Road to E. of California Aqueduct (to T-2a)	
ALT-2a	North of UP at Greenville Road to east of Livermore	
ALT-2c	East of Livermore to west of I-580	
ALT-2d	West of I-580 to west of California Aqueduct (to T-2a)	
ALT-2e	West of I-580 to E. of Delta Mendota Canal (to T-1a)	
ALT-3a	I-580 at Greenville Road to N. Flynn Road	
<b>Tracy (Area 4.1)</b>		
T-1a	East of Delta Mendota Canal to west of San Joaquin River (through downtown Tracy)	Downtown Tracy
T-2a	East of California Aqueduct to west of San Joaquin River (via south of Tracy))	S Tracy
<b>San Joaquin River to Stockton, San Joaquin River to Ripon/Modesto Vicinity (Area 4.2 and Area 4.3)</b>		
120a	SR 120 at South Union Road to east of SR 99 south of Manteca	Manteca/SR 120
120b	SR 120 at South Union Road to BNSF south of Escalon via SR 120 Plan line	Manteca/SR 120
5b	I-5 north of Louise Avenue to south of French Camp Road, via I-5	Lathrop/I-5
Lb	Louise Road to north of Sharpe Depot via former SP	Lathrop/Manteca (Louise Avenue)
Lc	North of Sharpe Depot to S. French Camp Road via former SP	

Segment	Segment Description	Station
Ma	East of UP Fresno Subdivision from east of Airport Way to East of SR 99 south of Manteca	
Mb	Louise Avenue to North of Lathrop Road, east of UP	Lathrop/Manteca (West Yosemite Bo)
Me	North of Lathrop Road to N. of Roth Road, east of UP	
Sa	South of French Camp Road to near McKinney Avenue (south of rail yard)	
Sb	French Camp Road to near McKinney Ave (S. of rail yard)	
Sc	McKinney Avenue (south of rail yard) to rail junction north of Charter Way	
Sd	North of Roth Road to Rail Junction north of Charter Way via Airport Way	
Se	Rail junction north of Charter Way to Stockton Cabral ACE Station	Downtown Stockton (Cabral)
T-1b	West of San Joaquin River (north of I-5) to I-5 north of Louise Avenue	
T-1c	West of San Joaquin River to Louise Avenue (former SP)	Lathrop/Manteca (Louise Avenue)
T-1d	West of San Joaquin River to Louise Ave. (east of UP)	Lathrop-Manteca (W. Yosemite)
T-1e	West of San Joaquin River to SR 120 at South Union Road	
T-2b	West of San Joaquin River (S. of I-5) to I-5 N. of Louise Ave.	
T-2c	West of San Joaquin River to Louise Avenue via former SP	Lathrop/Manteca (Louise Avenue)
T-2d	West of San Joaquin River to Louise Avenue (east of UP)	Lathrop/Manteca (West Yosemite Avenue)
T-2e	West of San Joaquin River to SR 120 at South Union Road	Manteca/SR 120
TB-1	Louise Avenue (on former SP) to near UP Fresno Subdivision east of Airport Way	
TB-2	Louise Road (east of UP) to near UP Fresno Subdivision east of Airport Way	

**Figure B-1**  
**Alternative Alignment Segments**

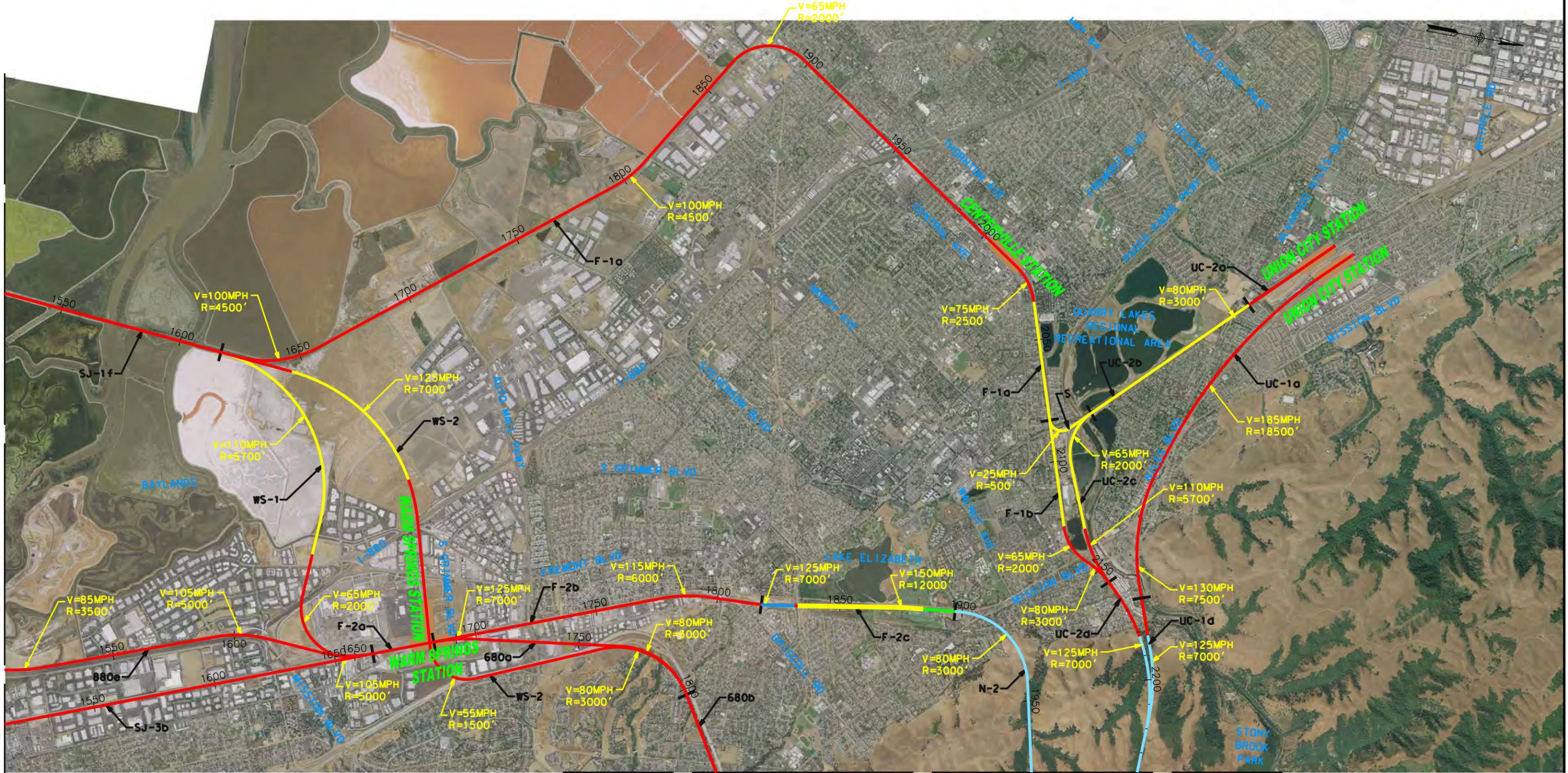


**Appendix C**  
**ENGINEERING DRAWINGS**





MATCH LINE - SEE DRAWING SJ-1



MATCH LINE - SEE DRAWING SJ-3

**LEGEND:**

- AT-GRADE
- AERIAL
- TUNNEL
- RETAINED CUT
- RETAINED FILL
- STATION



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FOR DISCUSSION PURPOSES ONLY**

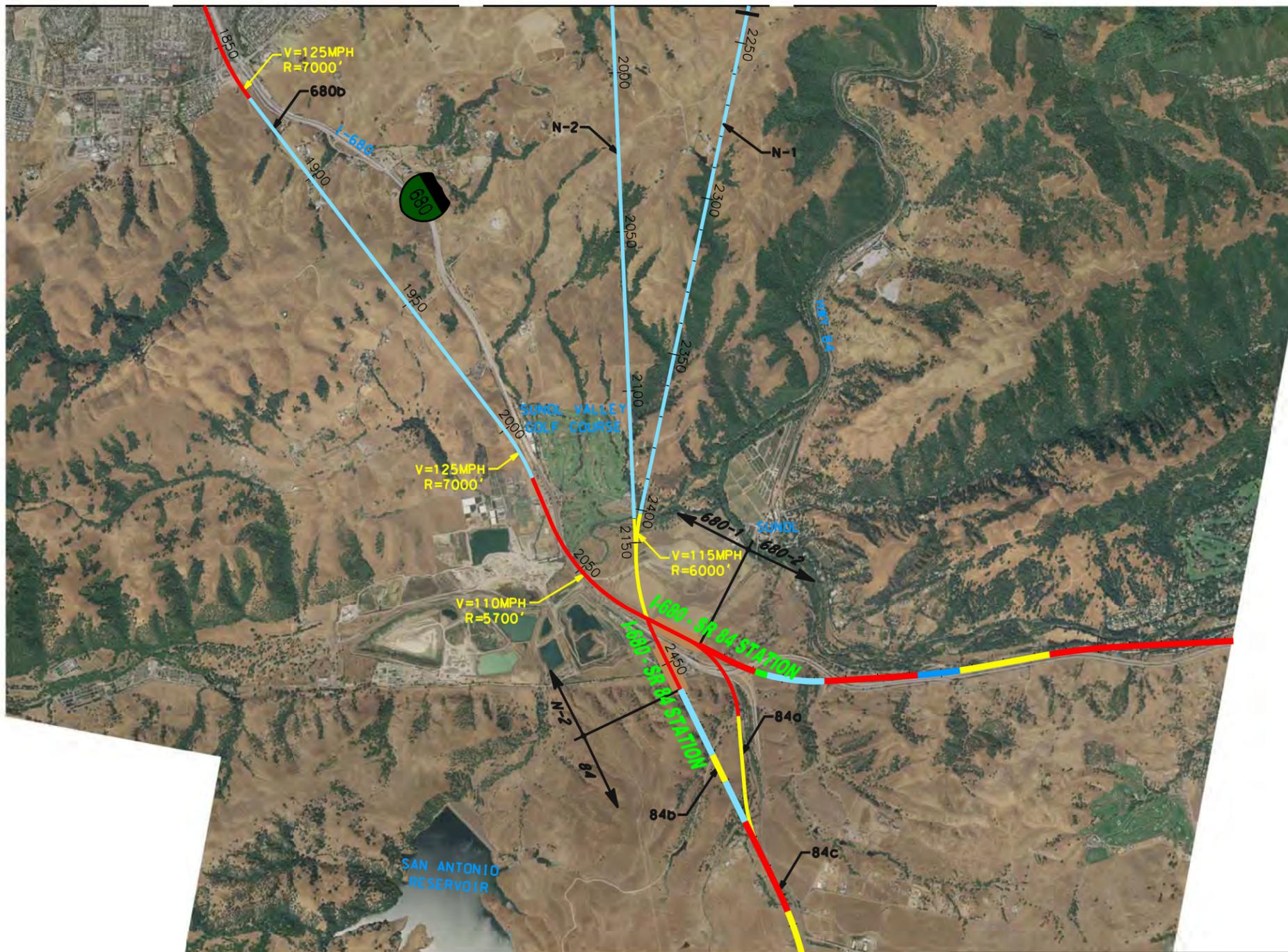
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**ALTAMONT RAIL CORRIDOR PROJECT  
ALTAMONT PASS  
SUBSECTION 2 AND 3**

SHEET 2 OF 3

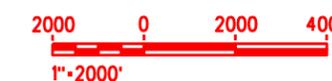
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SCALE	1" = 2000'
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MATCH LINE - SEE DRAWING SJ-2



**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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FOR DISCUSSION PURPOSES ONLY**

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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS  
SUBSECTION 3 AND 4**

SHEET 3 OF 3

CONTRACT NO. -  
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SCALE 1" = 2000'  
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**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
AREA 2, ALTERNATIVE TV-1  
SEGMENTS 680-c AND 680-d

SHEET 1 OF 1

CONTRACT NO.	-
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**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
 AREA 2, ALTERNATIVE TV-1b  
 SEGMENTS 580a, 580c AND 580d  
 SHEET 1 OF 1

CONTRACT NO.	-
DRAWING NO.	I-580
SCALE	1"=2000'-0"
SHEET NO.	### OF ###



**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
AREA 2, ALTERNATIVE TV-2b  
P-2a, P-2b(2), P-3, L-2a, L-2b & L-2c  
SUBWAY AT PLEASANTON  
SHEET 1 OF 1

CONTRACT NO.	-
DRAWING NO.	P-2B
SCALE	1"=2000'-0"
SHEET NO.	### OF ###



**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

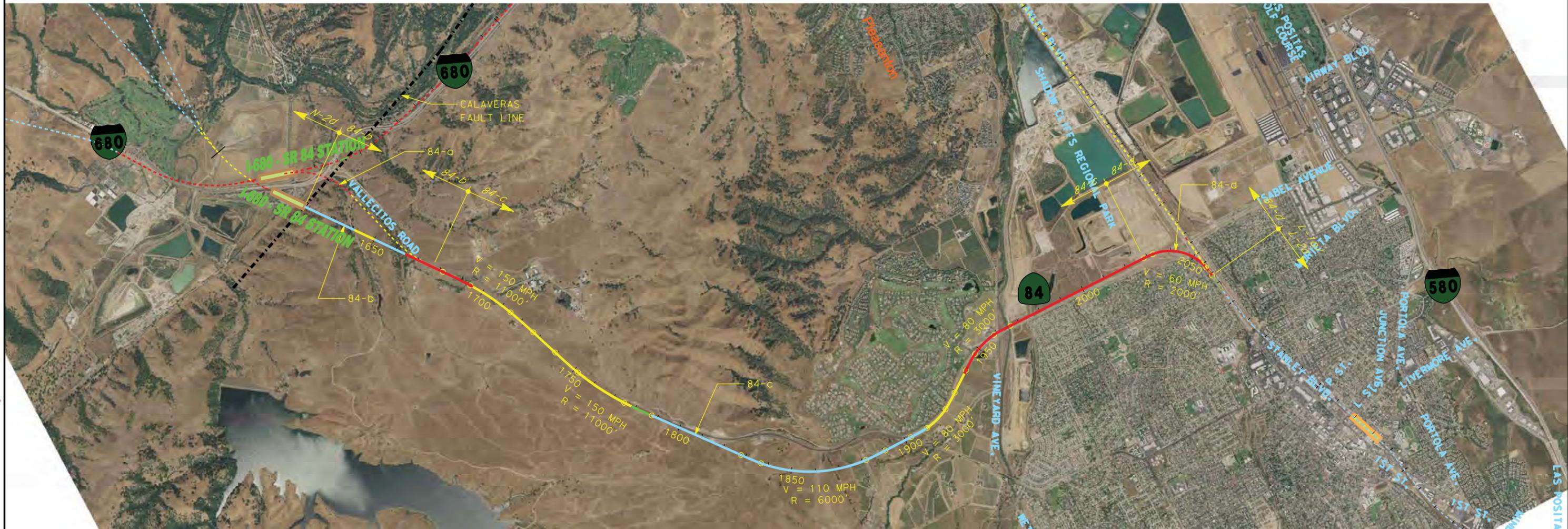
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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
AREA 2, ALTERNATIVE TV-2C  
SEGMENTS P-1, P-3, L-1a(2), L-2b AND L-2c

SHEET 1 OF 1

CONTRACT NO.	-
DRAWING NO.	P-1
SCALE	1"=2000'-0"
SHEET NO.	### OF ###



**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

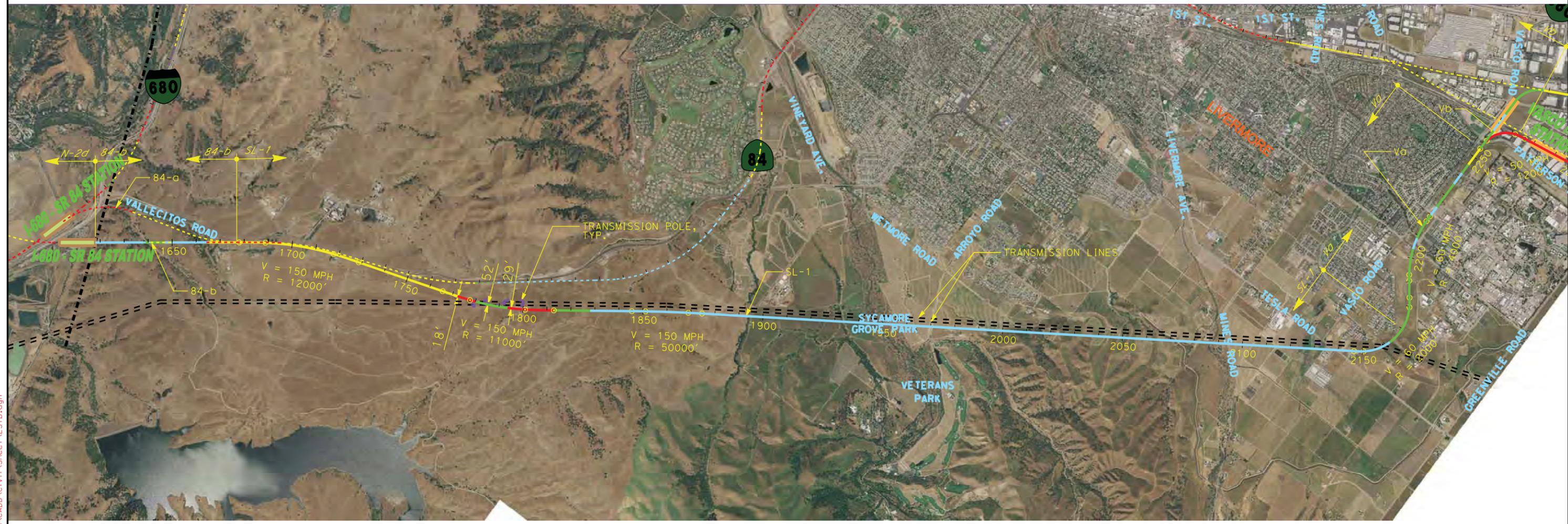
DESIGNED BY	
DRAWN BY	
CHECKED BY	
IN CHARGE	
DATE	07-29-10

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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
AREA 2, ALTERNATIVE TV-3  
SEGMENTS 84-a or b, 84-c AND 84-d

SHEET 1 OF 1

CONTRACT NO.	-
DRAWING NO.	SR-84A
SCALE	1"=2000'-0"
SHEET NO.	### OF ###



**LEGEND:**

AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
STATION	



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**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

DESIGNED BY	
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DATE	07-29-10

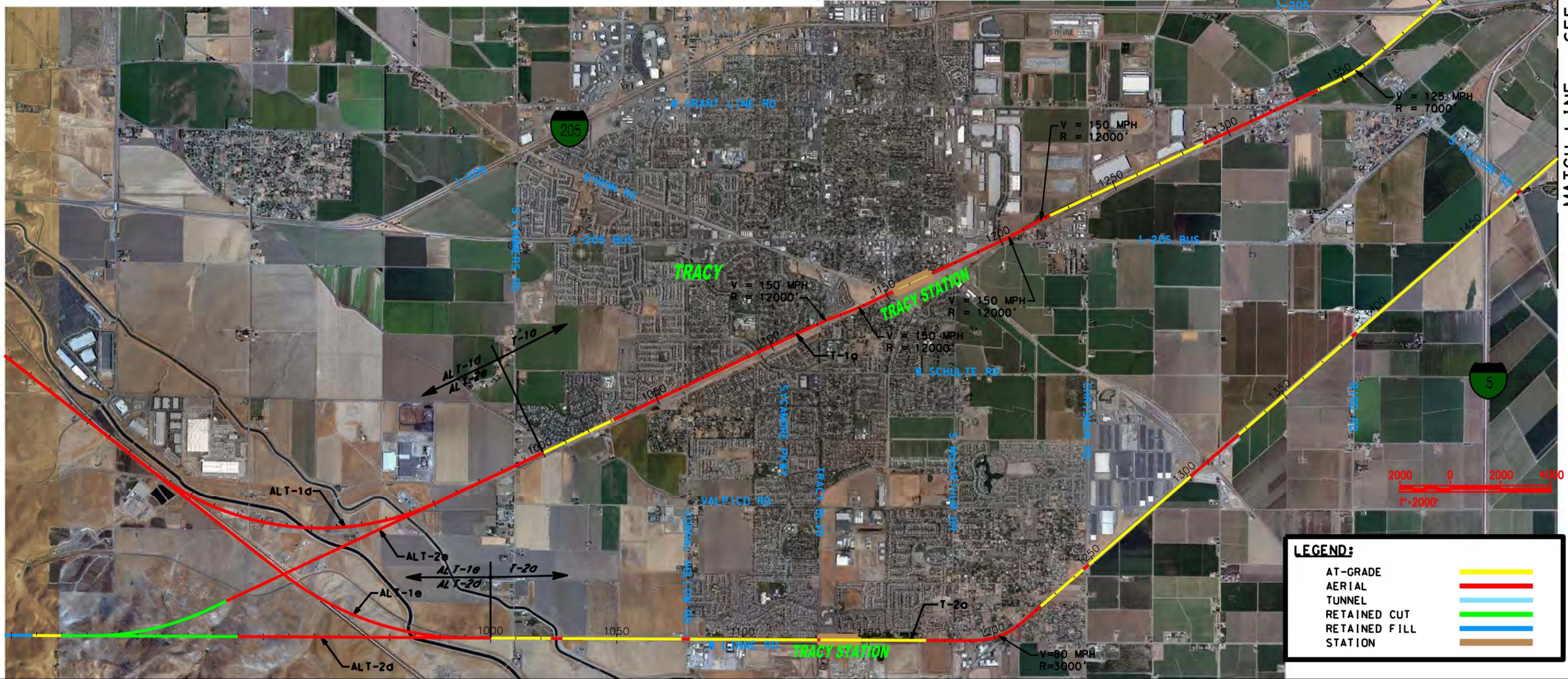
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**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS**  
 AREA 2, ALTERNATIVE TV-4a  
 SEGMENTS 84-a OR b, SL-1, Va, Vb AND L1-c

SHEET 1 OF 1

CONTRACT NO.	-
DRAWING NO.	LS1B
SCALE	1"=2000'-0"
SHEET NO.	### OF ###





MATCH LINE - SEE DRAWING CV-2

**LEGEND:**

- AT-GRADE
- AERIAL
- TUNNEL
- RETAINED CUT
- RETAINED FILL
- STATION

**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

DESIGNED BY	
DRAWN BY	
CHECKED BY	
IN CHARGE	
DATE	

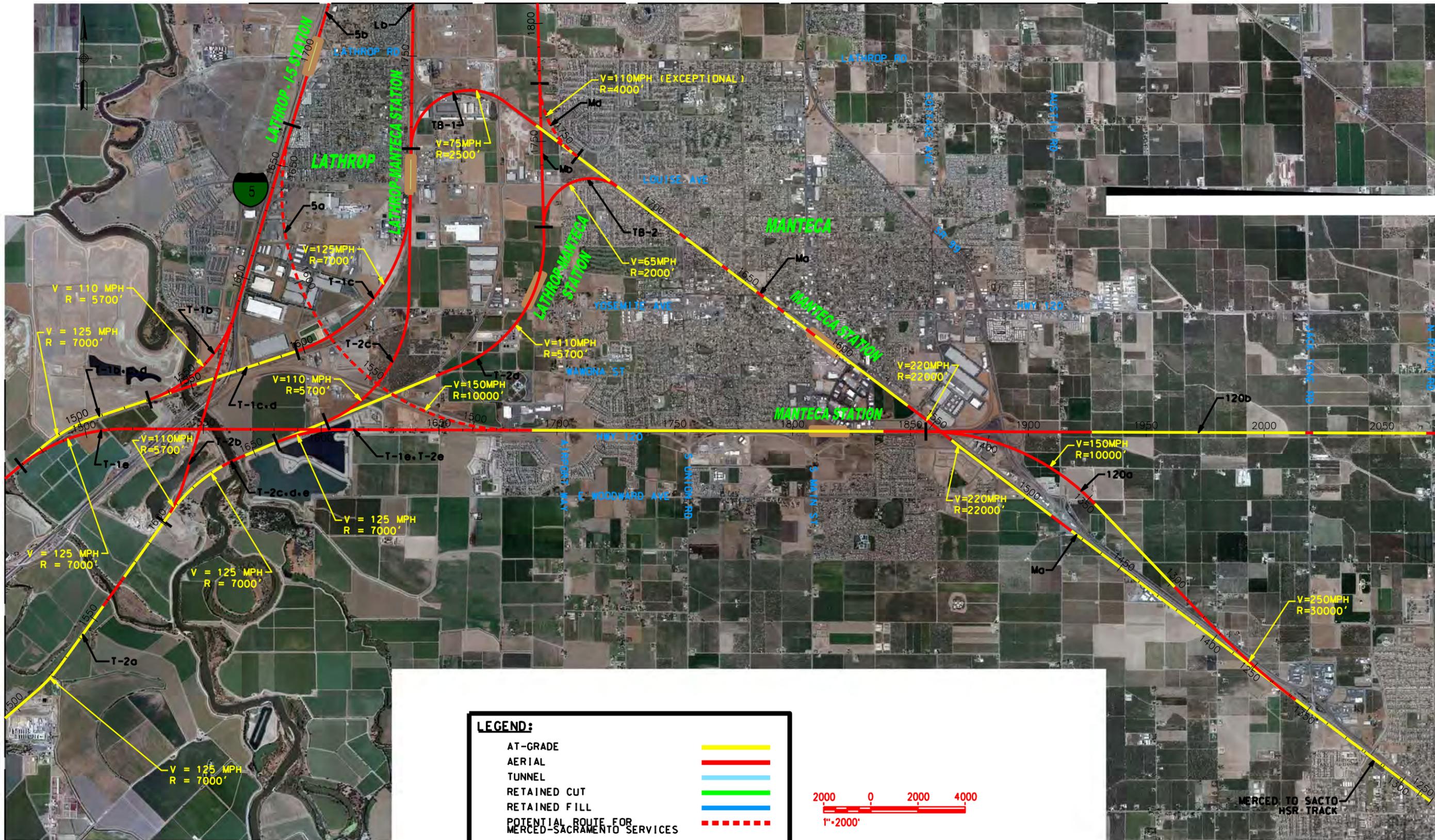
**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS  
SUBSECTIONS 8**

SHEET 1 OF 4

CONTRACT NO.	
DRAWING NO.	CV-1
SCALE	1" = 2000'
SHEET NO.	#### OF ####

MATCH LINE - SEE DRAWING CV-1

MATCH LINE - SEE DRAWING CV-4



**LEGEND:**

- AT-GRADE
- AERIAL
- TUNNEL
- RETAINED CUT
- RETAINED FILL
- POTENTIAL ROUTE FOR MERCED-SACRAMENTO SERVICES
- STATION



**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

DESIGNED BY	
DRAWN BY	
CHECKED BY	
IN CHARGE	
DATE	

**ALTAMONT CORRIDOR RAIL PROJECT  
ALTAMONT PASS  
SUBSECTIONS 8**

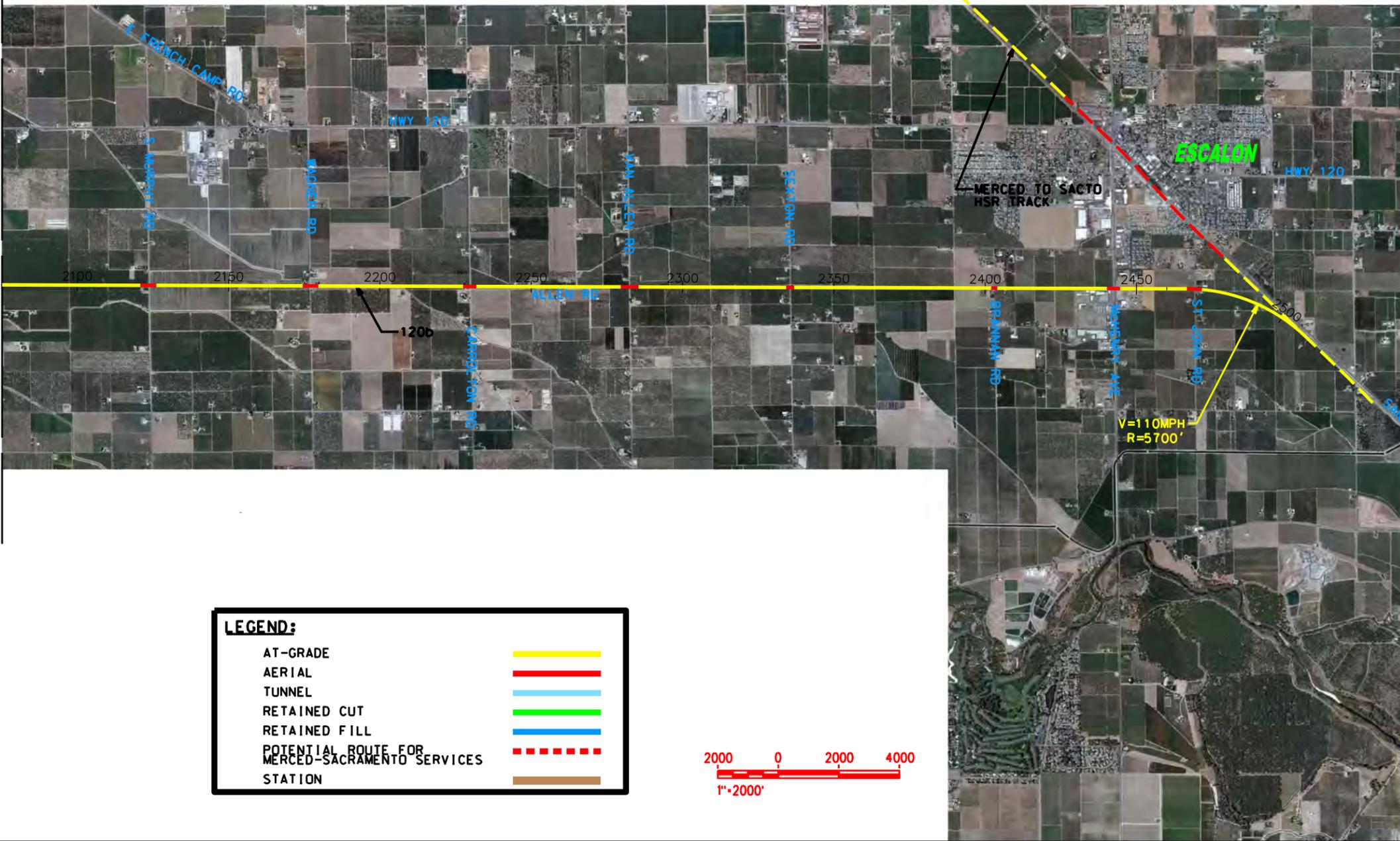
SHEET 2 OF 4

CONTRACT NO.	
DRAWING NO.	CV-2
SCALE	1" = 2000'
SHEET NO.	#### OF ####





MATCH LINE - SEE DRAWING CV-2



LEGEND:	
AT-GRADE	
AERIAL	
TUNNEL	
RETAINED CUT	
RETAINED FILL	
POTENTIAL ROUTE FOR MERCED-SACRAMENTO SERVICES	
STATION	



**PRELIMINARY AND TENTATIVE  
FOR DISCUSSION PURPOSES ONLY**

DESIGNED BY	
DRAWN BY	
CHECKED BY	
IN CHARGE	
DATE	

**CALIFORNIA HIGH-SPEED TRAIN PROJECT  
ALTAMONT PASS  
SUBSECTION 10**

SHEET 4 OF 4

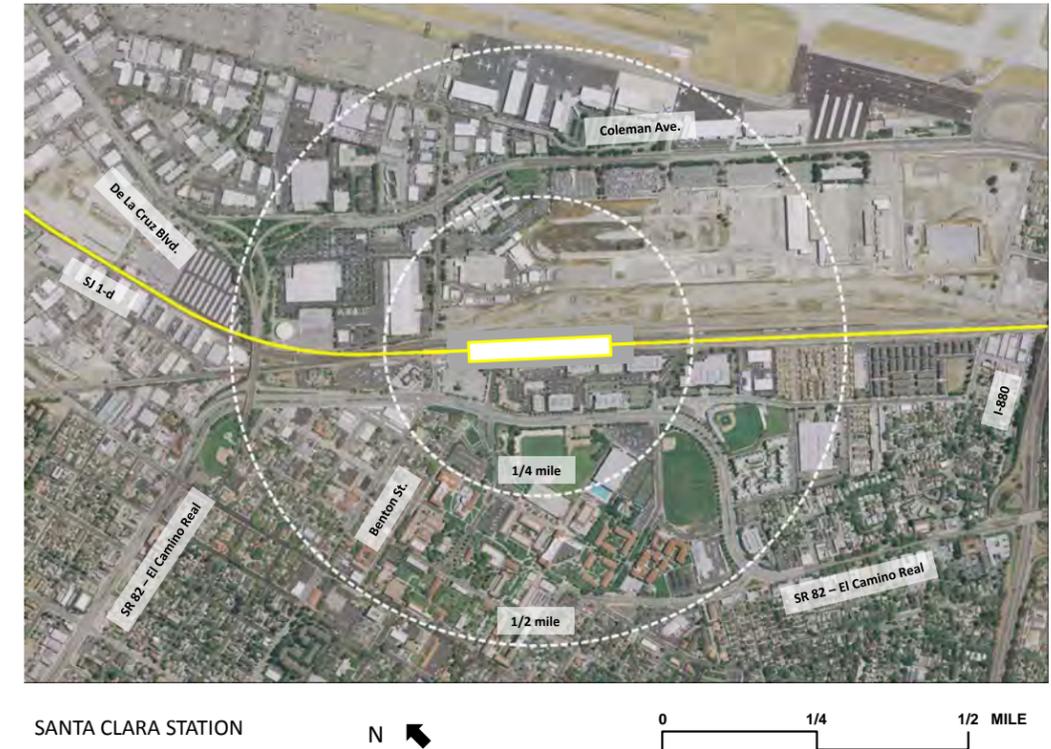
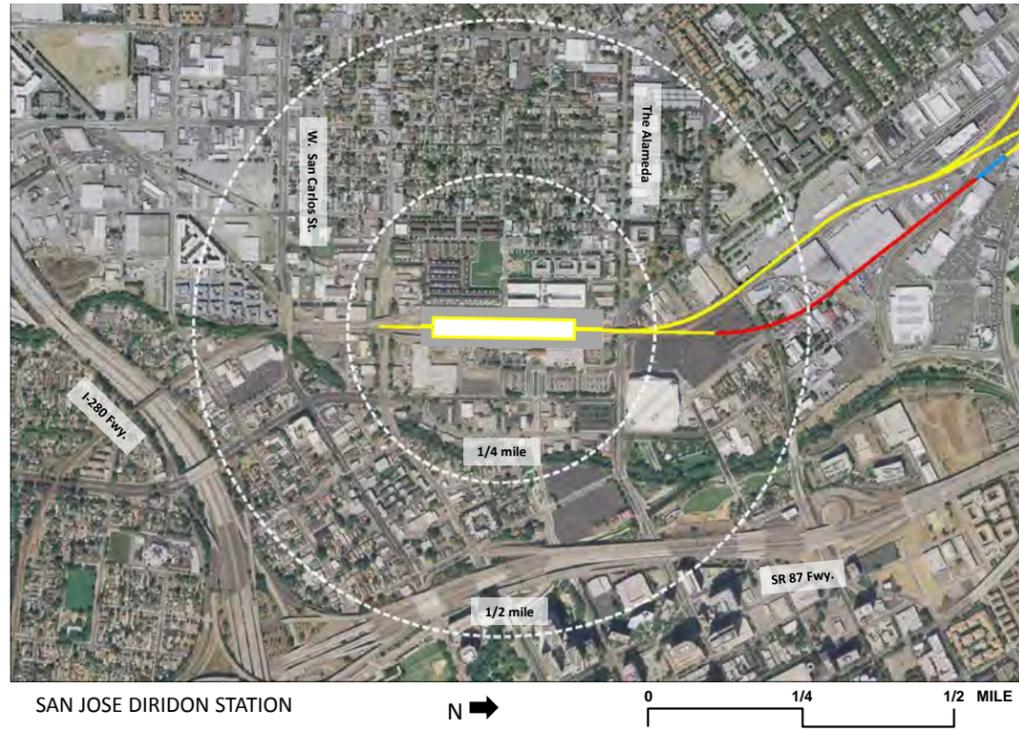
CONTRACT NO.	
DRAWING NO.	CV-4
SCALE	1" = 2000'
SHEET NO.	#### OF ####



**Appendix D**  
**STATION LAYOUT DRAWINGS**



Figure D-1  
Station Maps: San Jose to Fremont (Area 1.1)



**LEGEND**

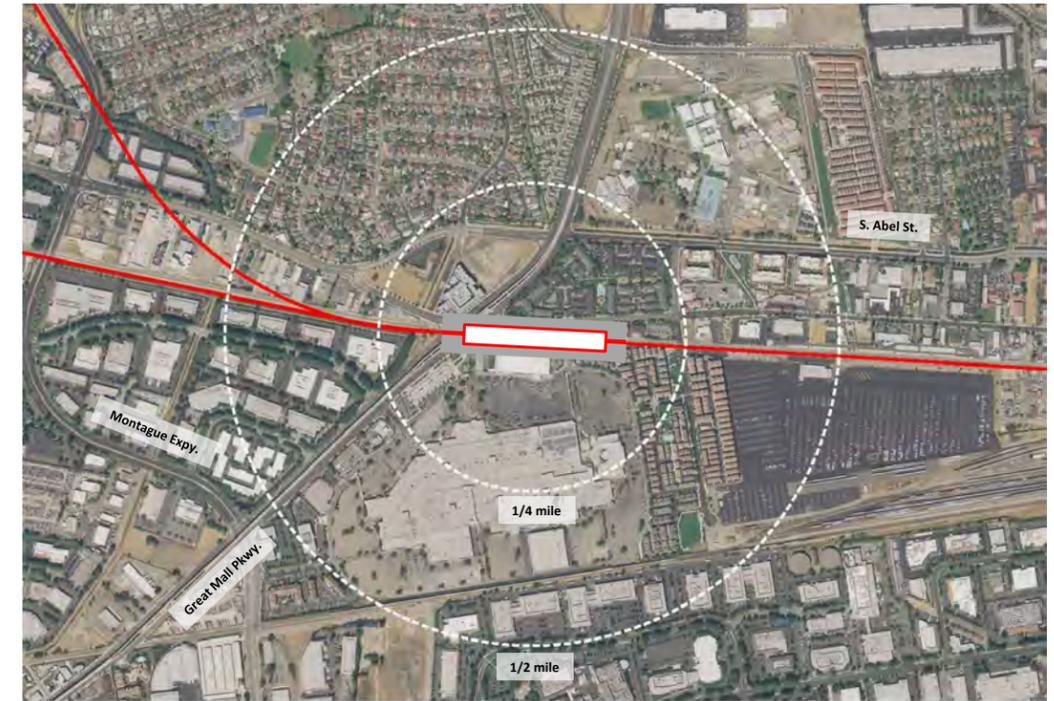
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- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

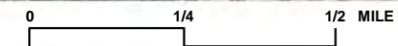
Figure D-2  
Station Maps: San Jose to Fremont (Area 1.1)



TASMAN / I-880 STATION



TASMAN / GREAT MALL STATION



WARM SPRINGS BART STATION (ALT. 1)



WARM SPRINGS BART STATION (ALT. 2)



LEGEND

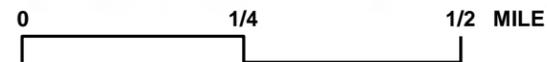
- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

Figure D-3  
Station Maps: Fremont to I-680/SR 84 (Area 1.2)



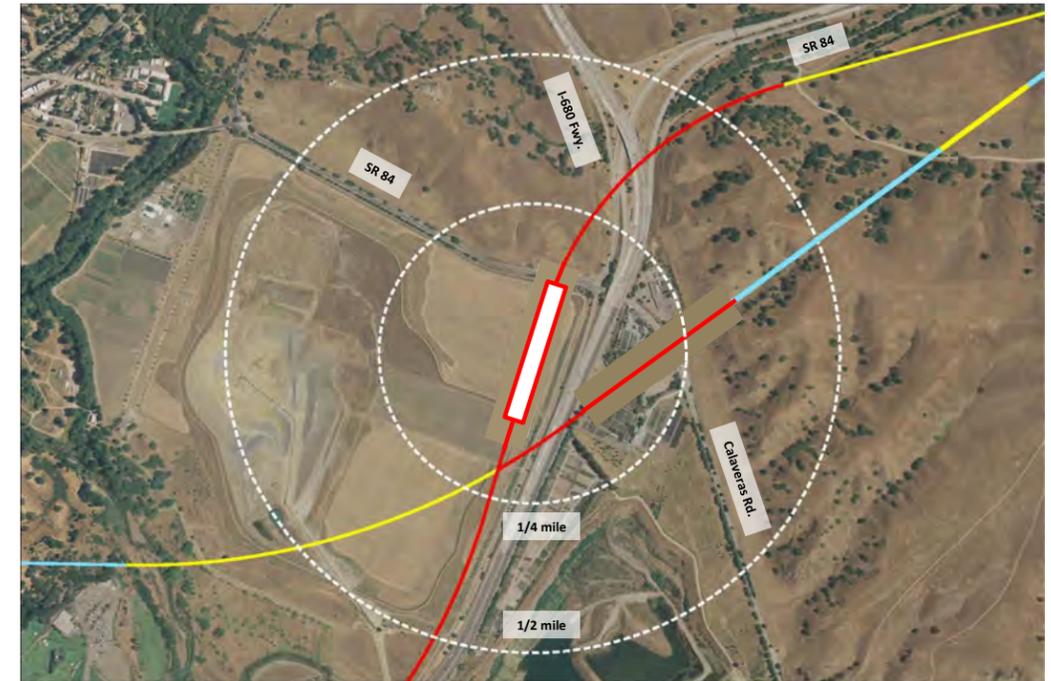
FREMONT CENTERVILLE STATION



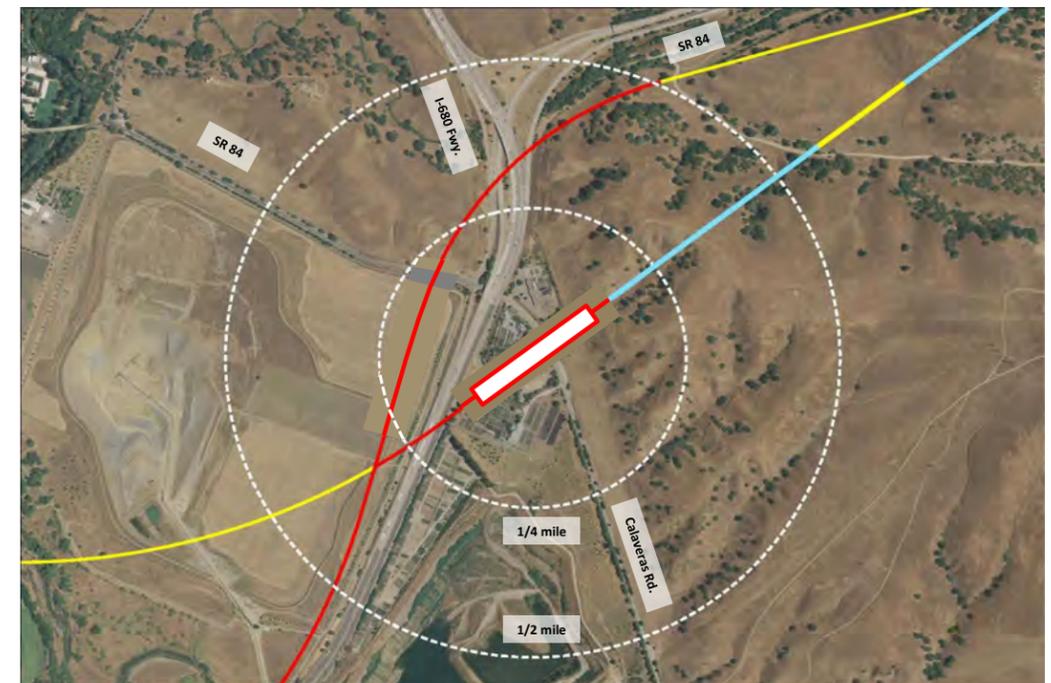
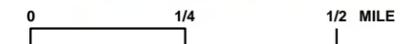
LEGEND

- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.



I-680/SR 84 STATION (ALT. 1)



I-680/SR 84 STATION (ALT. 2)



Figure D-4  
Station Maps: Union City to I-680/SR 84 (Area 1.3)



UNION CITY INTERMODAL STATION (ALT. 1) N →



UNION CITY INTERMODAL STATION (ALT. 2) N →



LEGEND

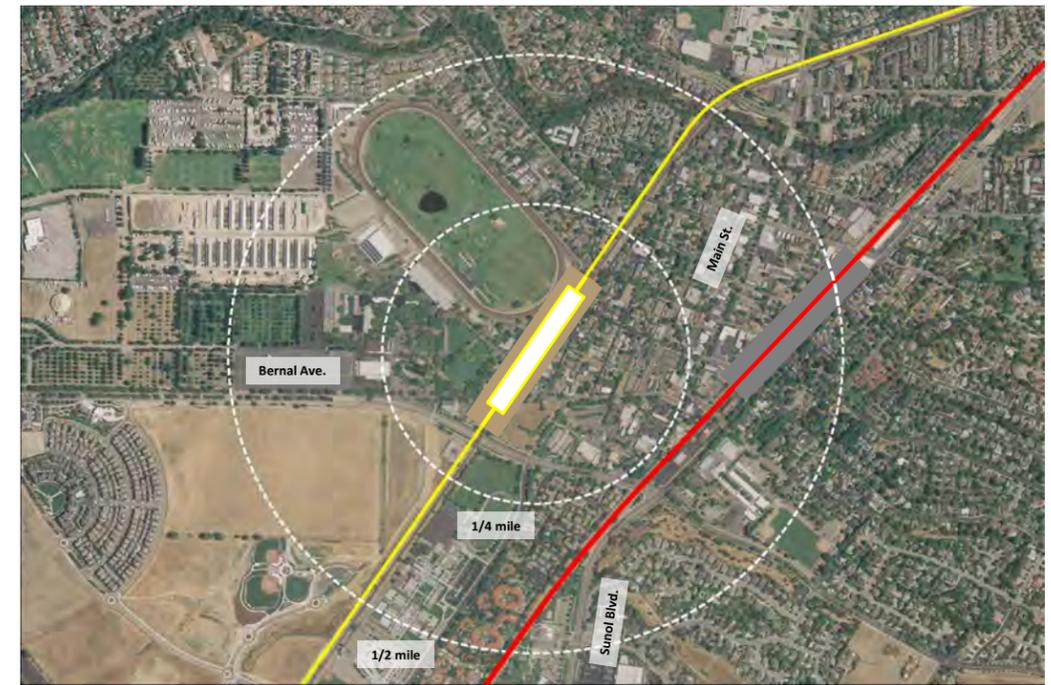
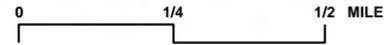
- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

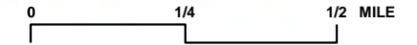
Figure D-5  
Station Maps: Tri-Valley (Area 2)



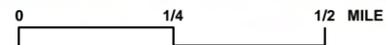
BERNAL/I-680 STATION



PLEASANTON UP STATION



PLEASANTON SP STATION



DUBLIN/PLEASANTON BART STATION

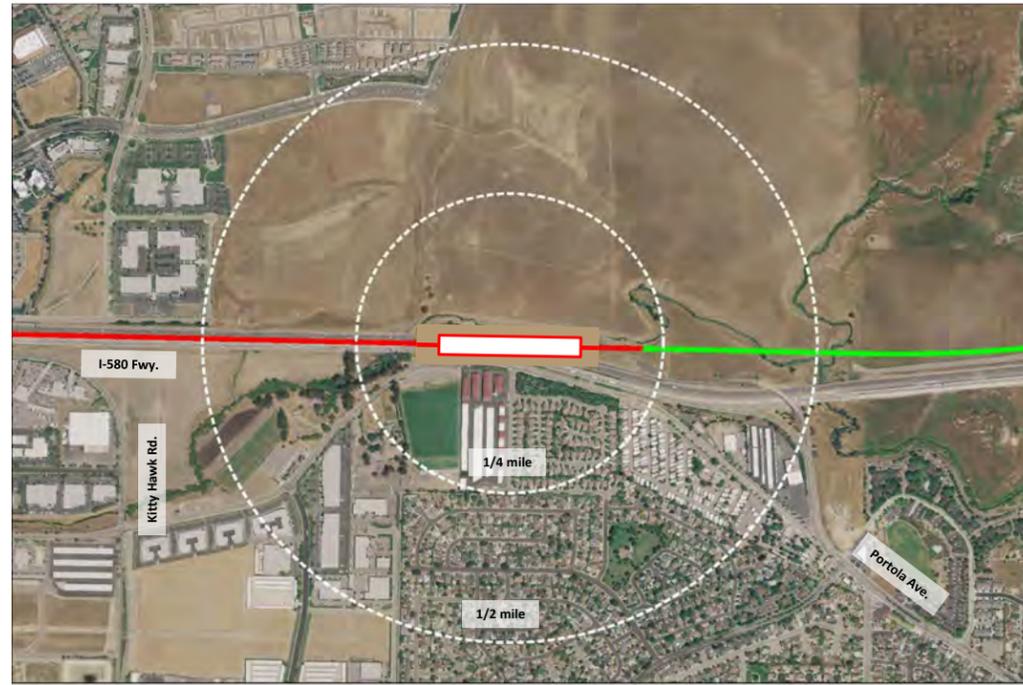


LEGEND

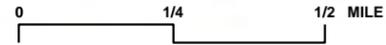
- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

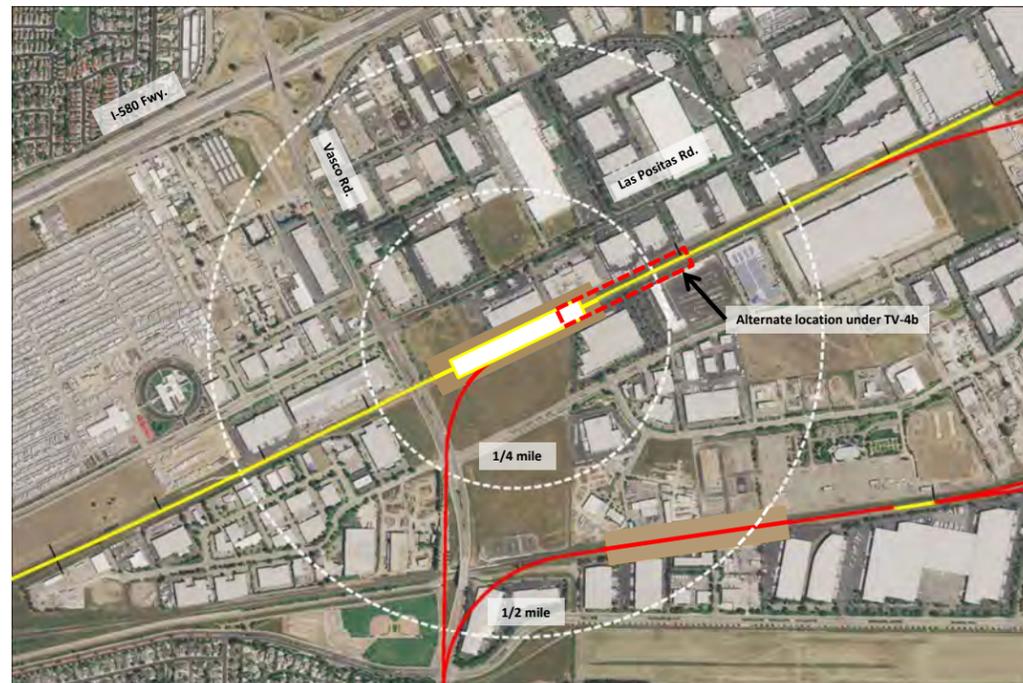
Figure D-6  
Station Maps: Tri-Valley (Area 2)



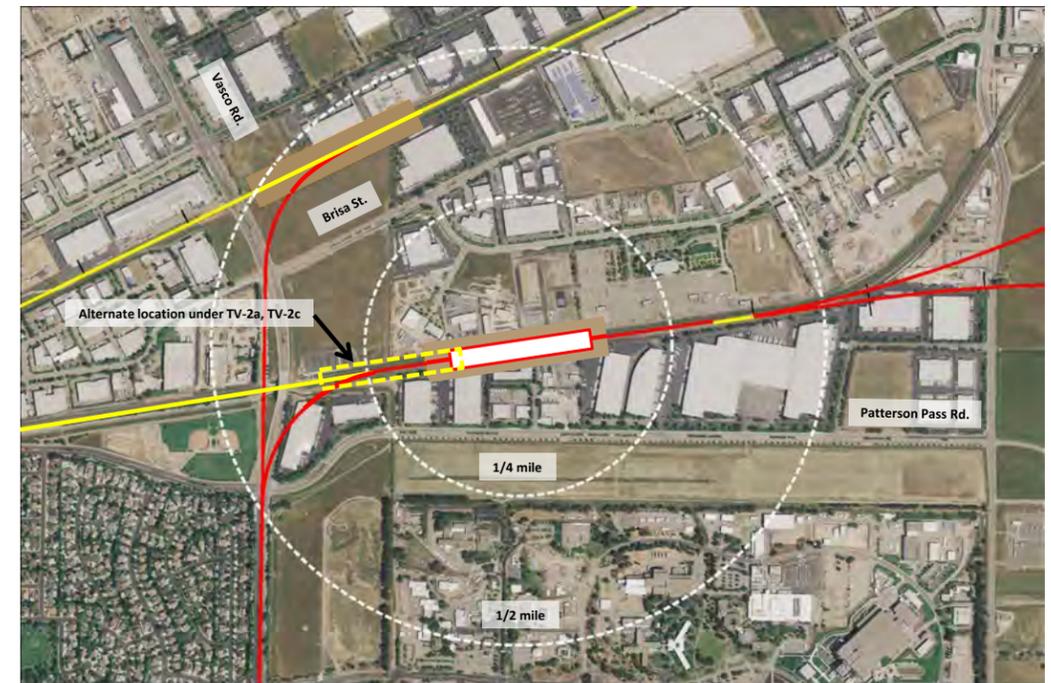
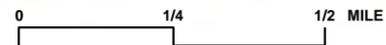
ISABEL/I-580 STATION



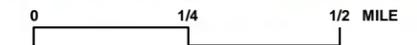
DOWNTOWN LIVERMORE STATION



VASCO SP STATION



VASCO UP STATION



LEGEND

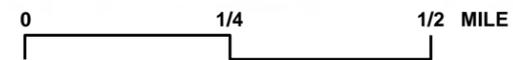
- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

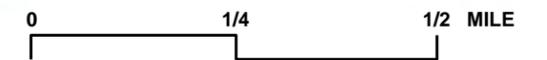
Figure D-7  
Station Maps: Tracy (Area 4.1)



DOWNTOWN TRACY STATION



SOUTH TRACY STATION



LEGEND

- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

Figure D-8  
Station Maps: San Joaquin River to Stockton (Area 4.2)



LATHROP/I-5 STATION N ↑ 0 1/4 1/2 MILE



LATHROP/MANTECA (LOUISE AVE.) STATION N ↑ 0 1/4 1/2 MILE



LATHROP/MANTECA (W. YOSEMITE AVE.) STATION N ↑ 0 1/4 1/2 MILE



STOCKTON STATION N ↑ 0 1/4 1/2 MILE

LEGEND

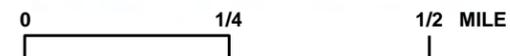
- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.

Figure D-9  
Station Maps: San Joaquin River to Ripon/Escalon Vicinity (Area 4.3)



MANTECA DOWNTOWN STATION



MANTECA/SR 120 STATION



LEGEND

- At-Grade
- Aerial
- Tunnel
- Retained Cut
- Retained Fill

Source: HNTB 2010.



**Appendix E**  
**SCREENING ANALYSIS SUMMARY TABLES**



**Table E-1  
San Jose to Fremont (Area 1.1)**

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)								
Category	Criteria	Measurement	EB-1 (WITHDRAWN)	EB-2 (WITHDRAWN)	EB-3 (WITHDRAWN)	EB-4 (CARRIED FORWARD)	EB-5 (CARRIED FORWARD)	EB-6 (CARRIED FORWARD)	EB-7 (WITHDRAWN)	EB-8 (WITHDRAWN)	
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	24.49	19.84	20.84	18.59	19.73	20.03	15.18	14.83	
		Route length (within option) - Miles	19	15	15	16	15	15	13	13	
	Maximize connectivity and accessibility	Intermodal connections	Connects to VTA Light Rail, Amtrak, Capitol Corridor, Regional Bus Services and future HST and SJC Connection.	Connects to VTA Light Rail, Amtrak, Capitol Corridor, Regional Bus Services and future HST and SJC Connection.	Connects to VTA Light Rail, Amtrak, Capitol Corridor, Regional Bus Services and future HST and SJC Connection.	Connects to VTA Light Rail, Amtrak, Capitol Corridor, Regional Bus Services and future HST and SJC Connection.	Connects to VTA Light Rail, Caltrain, Amtrak, Regional Bus Services, and future BART, HST, and SJC Connection.	Connects to VTA Light Rail, Caltrain, Amtrak, Regional Bus Services, and future BART, HST, and SJC Connection.	Connects to VTA Light Rail, Amtrak, Regional Bus Services, and future BART and HST. However, only has one station (Tasman/880) between Fremont and San Jose, and thus provides limited service with within primary employment centers.	Connects to VTA Light Rail, Amtrak, Regional Bus Services, and future BART and HST. However, only has one station (Tasman/Great Mall) between Fremont and San Jose, and thus provides limited service with within primary employment centers.	
			Minimize operating and capital costs	Daily Train Hours	13.9	11.2	11.8	10.5	11.2	11.4	8.6
	Minimize operating and capital costs	Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)	Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)	1.65	1.33	1.40	1.25	1.33	1.35	1.02	1.00
			Capital cost, does not include ROW	1.40	1.0	1.01	1.16	1.37	1.37	1.70 (Highest Cost of Alternatives in Area)	1.66 (2 <sup>nd</sup> Highest Cost of Alternatives in Area)
			Acquisition cost of additional ROW	1.5	1.13	1.80	1.20	1.11	1.14	1.0	1.01
Land Use	Development potential for TOD within walking distance of station	Development potential for TOD within 1/2 mile of station location	Strong support in downtown San Jose for development around the future SJ Diridon Station, moderate long-term TOD development potential for land north of Santa Clara Station, at the Great America Station there is long-term redevelopment potential if 49ers stadium and associated mixed use is constructed, and small infill opportunities, but unknown long-term larger redevelopment potential associated with Fremont-Centerville Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, moderate long-term TOD development potential for land north of Santa Clara Station, at the Great America Station there is long-term redevelopment potential if 49ers stadium and associated mixed use is constructed, and large TOD opportunities adjacent to the Warm Springs Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, moderate long-term TOD development potential for land north of Santa Clara Station, at the Great America Station there is long-term redevelopment potential if 49ers stadium and associated mixed use is constructed, and large TOD opportunities adjacent to the Warm Springs Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, moderate long-term TOD development potential for land north of Santa Clara Station, at the First Street/Trimble future Station there are several large vacant commercial parcels within 1/2 of a mile, two modest sized parcels at I-880/Tasman Station and there are large TOD opportunities adjacent to the Warm Springs Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, moderate long-term TOD development potential for land north of Santa Clara Station, at the First Street/Trimble future Station there are several large vacant commercial parcels within 1/2 of a mile, several small parcels and conversion of a parking lot near the Great Mall/Tasman Station, and there are large TOD opportunities adjacent to the Warm Springs Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, several small parcels plus a parking lot renovation at I-880/Tasman Station, and there are large TOD opportunities adjacent to the Warm Springs Station.	Strong support in downtown San Jose for development around the future SJ Diridon Station, small parcels and a parking lot conversion near Great Mall/Tasman Station, and there are large TOD opportunities adjacent to the Warm Springs Station.		

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)							
Category	Criteria	Measurement	EB-1 (WITHDRAWN)	EB-2 (WITHDRAWN)	EB-3 (WITHDRAWN)	EB-4 (CARRIED FORWARD)	EB-5 (CARRIED FORWARD)	EB-6 (CARRIED FORWARD)	EB-7 (WITHDRAWN)	EB-8 (WITHDRAWN)
Land Use cont'd	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Generally consistent with the transportation intent in the General Plans of the City of San Jose, City of Santa Clara, City of Fremont, and City of Newark. Use of Caltrain ROW consistent with existing rail use. High level of inconsistency of new ROW in Don Edwards National Wildlife Refuge. Inconsistent with circulation use of Lafayette St. if lanes taken. High level of inconsistency where ROW through residential areas adjacent to UP Centerville Line. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses.	Generally consistent with transportation intent in the General Plans of the City of San Jose, City of Santa Clara, and City of Fremont. Use of Caltrain ROW consistent with existing rail use. High level of inconsistency of new ROW in Don Edwards National Wildlife Refuge. Inconsistent with circulation use of Lafayette St. if lanes taken. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plans of the City of San Jose, City of Santa Clara, and the City of Fremont. Use of Caltrain ROW consistent with existing rail use. High level of inconsistency of new ROW in Don Edwards National Wildlife Refuge. Inconsistent with circulation use of Lafayette St. if lanes taken. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plans of the City of San Jose, City of Santa Clara, City of Milpitas, and City of Fremont. Use of Caltrain ROW consistent with existing rail use. Inconsistent with circulation use of Lafayette St. if lanes taken. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plans of the City of San Jose, City of Santa Clara, City of Milpitas, and City of Fremont. Use of Caltrain ROW consistent with existing rail use and use of I-880 consistent with existing transportation corridor use. Land use inconsistencies where route is located outside of existing rail or freeway ROWs in land designated for commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plans of the City of Fremont, City of Milpitas, City of San Jose, and City of Santa Clara. Use of Caltrain ROW consistent with existing rail use. High level of inconsistency where routes through commercial or residential areas adjacent to UP Warm Springs Subdivision. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plans of the City of San Jose, City of Milpitas and City of Fremont. Route requires use of certain commercial and residential properties in downtown San Jose redevelopment area which would be inconsistent with existing/intended uses. Use of I-880 consistent with existing transportation corridor use. Other land use inconsistencies where route is located outside of freeway ROWs in land designated for commercial, park, industrial or other uses.	Generally consistent with the transportation intent in the General Plan of the City of Fremont, City of Milpitas, and City of San Jose. Route requires use of certain commercial and residential properties in downtown San Jose redevelopment area which would be inconsistent with existing/intended uses. Use of I-880 consistent with existing transportation corridor use. High level of inconsistency where routes through commercial or residential areas adjacent to UP Warm Springs Subdivision. Other Land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses.
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	8 ac (4 ac at De La Cruz Boulevard and Reed Street, and 4 ac at Gold Street and El Dorado Street)	18 ac (4 ac at Del La Cruz Boulevard and Reed Street, 4 ac at Gold Street and El Dorado Street, and 10 ac at Grimmer Boulevard)	18 ac (4 ac at De La Cruz Boulevard and Reed Street, 4 ac at Gold Street and El Dorado Street, and 10 ac at Fremont Boulevard)	15 ac (4 ac at De La Cruz Boulevard and Reed Street, 7 ac at Zanker Road and SR 237, and 4 ac at Dixon Landing Road)	8 ac (4 ac at De La Cruz Boulevard and Reed Street and 4 ac at Dixon Landing Road)	8 ac (4 ac at De La Cruz Boulevard and Reed Street and 4 ac at Mission Falls Court)	6 ac (2 ac at McKendrie Street [Tunnel In Portal] and 4 ac at Dixon Landing Road)	6 ac (2 ac at McKendrie Street [Tunnel In Portal] and 4 ac at Mission Falls Court)
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	SR 82, I-880, US 101, SR 237	SR 82, I-880, US 101, SR 237, I-680	SR 82, I-880, US 101, SR 237	SR 82, I-880, US 101, SR 237, SR 262	SR 82, I-880, US 101, SR 237	SR 82, I-880, US 101, SR 237	SR 82, I-880, US 101, SR 237, SR 262	SR 82, I-880, US 101, SR 237
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Amtrak, Caltrain, Capitol Corridor, UP, HST and BART (future)	Amtrak, Caltrain, Capitol Corridor, UP, HST and BART (future)	Amtrak, Caltrain, Capitol Corridor, UP, HST and BART (future)	Amtrak, Caltrain, Capitol Corridor, UP, HST and BART (future)	Amtrak, Caltrain, UP, Capitol Corridor, BART and HST (future)	Amtrak, Caltrain, UP, Capitol Corridor, BART and HST (future)	Amtrak, Caltrain, UP, Capitol Corridor, BART and HST (future)	Amtrak, Caltrain, HST, UP, BART (future)
	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings	High-voltage power line crossings

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)							
Category	Criteria	Measurement	EB-1 (WITHDRAWN)	EB-2 (WITHDRAWN)	EB-3 (WITHDRAWN)	EB-4 (CARRIED FORWARD)	EB-5 (CARRIED FORWARD)	EB-6 (CARRIED FORWARD)	EB-7 (WITHDRAWN)	EB-8 (WITHDRAWN)
Constructability cont'd	Residential and Business Displacement	Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Residential: 56 Business: 29 Total: 85 Displacement most intense in Fremont Centerville area. Highest displacement of alternatives in area.	Residential: 0 Business: 14 Total: 14	Residential: 0 Business: 17 Total: 17	Residential: 0 Business: 6 Total: 6	Residential: 0 Business: 11 Total: 11	Residential: 10 Business: 35 Total: 45	Residential: 5 Business: 27 Total: 32	Residential: 29 Business: 42 Total: 71 Displacement is focused within areas adjacent to UP Warm Springs Subdivision. 2 <sup>nd</sup> Highest displacement of alternatives in area.
Disruption to Communities	Properties with access affected	Properties with access affected	None	None	None	1	1	None	None	None
	Local traffic effects around station	Increase in traffic congestion	Minor impacts at Diridon, Great America, and Fremont-Centerville Stations, increases in local traffic at new Santa Clara Station and future BART Warm Springs stations	Minor impacts at Diridon, Great America Stations, increases in local traffic at new Santa Clara and future BART Warm Springs stations	Minor impacts at Diridon, Great America Stations, increases in local traffic at new Santa Clara and future BART Warm Springs Stations	Minor impacts at Diridon, Great America Stations, increases in local traffic at new Santa Clara and future BART Warm Springs Stations	Minor impacts at Diridon station, increases in local traffic at new Santa Clara, First/Trimble, I-880/Tasman interchange, and future BART Warm Springs Stations	Minor impacts at Diridon Station, increases in local traffic at new Great Mall, Santa Clara, First/Trimble corridor, and future BART Warm Springs stations	Minor impacts at Diridon station, and I-880/Tasman interchange, and increases in local traffic at future BART Warm Springs stations	Minor impacts at Diridon station, increases in local traffic at new Great Mall station and future BART Warm Springs station
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	Traffic delays increased for at-grade crossing at Martin Avenue, Lafayette Street would lose lanes due to ROW for at-grade design option (but not for aerial option).	Traffic delays increased for at-grade crossing at Martin Avenue, Lafayette Street would lose lanes due to ROW for at-grade design option (but not for aerial option).	Traffic delays increased for at-grade crossing at Martin Avenue, Lafayette Street would lose lanes due to ROW for at-grade design option (but not for aerial option).	Traffic delays increased for at-grade crossing at Martin Avenue, Lafayette Street would lose lanes due to ROW for at-grade design option (but not for aerial option).	Traffic delays increased for at-grade crossing at Martin Avenue.	Traffic delays increased for at-grade crossing at Martin Avenue.	Circulation within HP Pavilion Parking Lot may need to be modified.	Circulation within HP Pavilion Parking Lot may need to be modified.
Environmental Resources	Waterways and Wetlands and Natural Preserves or Biologically Sensitive Habitat Areas Affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetland: 53 acres Streams: 0.40 mi Large areas of wetlands affected in Don Edwards National Wildlife Refuge.	Wetlands: 50 ac Streams: 0.40 mi Large areas of wetlands affected in Don Edwards National Wildlife Refuge and vernal pools in mitigation complex near Cushing Parkway.	Wetlands: 59 ac Streams: 0.50 mi Large areas of wetlands affected in Don Edwards National Wildlife Refuge and vernal pools in mitigation complex near Cushing Parkway.	Wetlands: 17 ac Streams: 1.4 mi	Wetlands: 8 ac Streams: 2.4 mi	Wetlands: 0 ac Streams: 0.20 mi	Wetlands: 9 ac Streams: 2.44 mi	Wetlands: 0.42 ac Streams: 0.20 mi
		Critical habitat (acres) Threatened and endangered species habitat (acres)	0 acres of critical habitat 81 acres of habitat for listed species including Salt Marsh Harvest Mouse, California Clapper Rail, California Black Rail and California tiger salamander.	0.29 acre of critical habitat for vernal pool species. 85 acres of habitat for listed species including Salt Marsh Harvest Mouse, California Clapper Rail, California Black Rail, California tiger salamander and vernal pool species.	0 acres of critical habitat 74 acres of habitat for listed species including Salt Marsh Harvest Mouse, California Clapper Rail, California Black Rail, California tiger salamander and vernal pool species.	0 acres of critical habitat 26 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 5 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 2 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 5 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 2 acres of habitat area with potential for presence of threatened and endangered species.

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)							
Category	Criteria	Measurement	EB-1 (WITHDRAWN)	EB-2 (WITHDRAWN)	EB-3 (WITHDRAWN)	EB-4 (CARRIED FORWARD)	EB-5 (CARRIED FORWARD)	EB-6 (CARRIED FORWARD)	EB-7 (WITHDRAWN)	EB-8 (WITHDRAWN)
Environmental Resources cont'd	Cultural Resources	Number of (previously recorded) historic structures within ultimate ROW	12	5	5	1	2	4	2 Historic Structures, 1 Historic District	3 Historic Structures, 1 Historic District
		Archeological Sensitivity (identified as present or not previously recorded archaeological sites within ROW)	0	1	1	0	1	1	1	1
	Parklands	Acres of parklands within ultimate ROW	29 acres of publicly owned land affected (Don Edwards National Wildlife Refuge, Guadalupe River trail, and Coyote Creek Parkchain)	42 acres of publicly owned land affected (Don Edwards National Wildlife Refuge)	40 acres of publicly owned land affected (Don Edwards National Wildlife Refuge)	3 acres of publicly owned land affected (Guadalupe River trail and Coyote Creek Parkchain)	1 acre of publicly owned lands affected (Don Edwards National Wildlife Refuge)	0 acres	2 acres of publicly owned land affected (Coyote Creek Parkchain)	0.5 acre of publicly owned land affected (Coyote Creek Parkchain)
	Agricultural Lands	Acres of farmland Acres of land in Williamson Act <sup>1</sup> contract	Williamson Act: 9 acres	0 acres	0 acres	Prime: 9 acres	Prime: 1 acre	0 acres	Prime: 1 acre	0 acres
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 590 Institutional: 3 School: 4 Park: 2 Noise impacts particularly extensive in Fremont/Centerville area. Highest number of sensitive receptors of alternatives in area.	Residential: 249 Institutional: 2 School: 1 Park: 1	Residential: 249 Institutional: 1 School: 1 Park: 1	Residential: 295 Institutional: 1 School: 1 Park: 1	Residential: 47 Institutional: 1 Medical: 2 Park: 1	Residential: 346 Institutional: 8 Medical: 1 School: 5 Park: 2	Residential: 156 Institutional: 8 School: 5 Park: 4	Residential: 373 Institutional: 14 School: 11 Park: 5 Noise impacts particularly extensive in area along UP Warm Springs Subdivision. 2 <sup>nd</sup> highest number of receptors of alternatives in area.
	Change in Visual/Scenic Resources	Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	At-grade structures visible from Cahill Park, residences adjacent to train tracks, residences along Lafayette Street, Lick Mill Park, Santa Clara Municipal Golf Course. Aerial structure visible from residences along Elizabeth Street and Thornton Ave and from Civic Center Park. Visual impacts particularly high in Fremont Centerville Area due to large number of residential receptors.	At-grade structures visible from Cahill Park, residences adjacent to train tracks, residences along Lafayette Street, Lick Mill Park, Santa Clara Municipal Golf Course and Don Edwards NWR. Aerial structure visible from residences along Elizabeth Street.	At-grade structures visible from Cahill Park, residences adjacent to train tracks, residences along Lafayette Street, Lick Mill Park, Santa Clara Municipal Golf Course and Don Edwards NWR. Aerial structure visible from residences along Elizabeth Street.	At-grade structures visible from Cahill Park, residences adjacent to train tracks, residences along Lafayette Street, Lick Mill Park, and Santa Clara Municipal Golf Course. Aerial structure visible from residences along SR 237.	At-grade structures visible from Cahill Park, and residences adjacent to train tracks. Aerial structure visible from residences along I-880.	At-grade structures visible from Cahill Park, and residences adjacent to train tracks. Aerial structure visible from neighborhood north of Montague Expwy and adjacent to train tracks and Dixon Landing Park.	At-grade structures visible from Cahill Park. Aerial structure visible from neighborhood adjacent to I-880.	At-grade structures visible from Cahill Park. Aerial Structure visible from neighborhood along Fumuaia Place and from neighborhoods adjacent to train tracks and Dixon Landing Park. Visual impacts particularly high adjacent to UP Warm Springs Subdivision with high number of residential receptors.

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)							
Category	Criteria	Measurement	EB-1 (WITHDRAWN)	EB-2 (WITHDRAWN)	EB-3 (WITHDRAWN)	EB-4 (CARRIED FORWARD)	EB-5 (CARRIED FORWARD)	EB-6 (CARRIED FORWARD)	EB-7 (WITHDRAWN)	EB-8 (WITHDRAWN)
Environmental Quality cont'd	Change in Visual/Scenic Resources	Number of scenic roadways that cross the ROW	0	0	0	0	0	0	0	0
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	1 Fault Crossing (Silver Creek)	2 Fault Crossings (Silver Creek, and unnamed)	2 Fault Crossings (Silver Creek, and unnamed)	2 Fault Crossings (Silver Creek, and unnamed)	1 Fault crossing (Silver Creek)	1 Fault crossing (Silver Creek)	1 fault crossing (Silver Creek)	1 fault crossing (Silver Creek)
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 28 1/4-mile: 2,130	100-ft ROW: 23 1/4 mile: 1,844	100-foot ROW: 21 1/4-mile: 1,874	100-ft. ROW: 26 1/4-mile: 2,093	100-ft. ROW: 138 1/4-mile: 2,130	100-ft. ROW: 157 1/4-mile: 2,699	100-ft. ROW: 70 1/4-mile: 1,825	100-ft. ROW: 57 1/4-mile: 2,244

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

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**Table E-2  
Fremont to I-680/SR 84 (Area 1.2)**

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)		
Category	Criteria	Measurement	EBWS-1 (CARRIED FORWARD)	EBWS-2 (CARRIED FORWARD)	EBF-1 (WITHDRAWN)
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	5.85	7.24	8.96 In combination with connecting Alternative EB-1, has slowest time between I-680/ SR84 and San Jose (by far) of all possible combinations.
		Route length (within option) - Miles	7.52	9.73	8.38
	Maximize connectivity and accessibility	Intermodal connections	Connects to future Warm Springs BART station, which will also have AC Transit links.	Connects to future Warm Springs BART station which will also have AC Transit links.	Connects to AMTRAK, Capitol Corridor, and is walking distance from AC Transit.
	Minimize operating and capital costs	Daily Train Hours	3.3	4.1	5.1
		Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)	1.0	1.23	1.53
		Capital cost, does not include ROW	1.0	1.44	1.25
		Acquisition cost of additional ROW	1.0	1.29	1.11
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	Large TOD opportunities adjacent to Warm Springs BART Station. Alameda County prohibits residential/commercial development in adjacent areas to I-680/SR 84 station, and therefore TOD potential does not exist at this station.	Large TOD opportunities adjacent to Warm Springs BART Station. Alameda County prohibits residential/commercial development in adjacent areas to I-680/SR 84 station, and therefore TOD potential does not exist at this station.	Fremont/Centerville ACE Station small infill opportunities at present with unknown potential for long -term larger redevelopment exist at Fremont/ Centerville ACE station. Alameda County prohibits residential/commercial development in adjacent areas to I-680/SR 84 station, and therefore TOD potential does not exist at this station.
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Generally consistent with the City of Fremont General Plan and transportation goals of East County Area Plan. Inconsistencies with crossing certain industrial areas from Warm Springs Station to I-680. Use of I-680 consistent with transportation corridor existing use. Other land use inconsistencies where route is located outside of freeway ROW in land designated for residential or open space uses. Potential inconsistency in Sunol Valley with active quarry areas along I-680.	Generally consistent with Fremont General Plan and transportation goals of East County Area Plan. High level of inconsistency where ROW through residential or park areas adjacent to UP Warm Springs Subdivision in Fremont. Other land use inconsistencies in Fremont where route is located outside of existing rail ROWs in land designated for commercial or industrial uses. Potential inconsistency in Sunol Valley with active quarry areas along I-680.	Generally consistent with Fremont General Plan and transportation goals of East County Area Plan. High level of inconsistency where ROW through residential areas adjacent to UP Centerville Line. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for commercial or industrial uses. Potential inconsistency in Sunol Valley with active quarry areas along I-680.
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	4 acres east of Mission Blvd. (Tunnel Portal)	4 acres near Stevenson Blvd. (Tunnel Portal)	4 acres south of SR 84 (Tunnel Portal)
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	I-680, SR 238 (Mission Boulevard)	SR 238	I-880, SR 238, SR 84
	Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP	UP
Disruption/relocation of existing utilities		Identify major utilities requiring relocation	None	High-voltage power line, Hetch-Hetchy Aqueduct	High-voltage power line
Residential and Business Displacement		Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Residential: 48 Businesses: 5	Residential: 3 Businesses: 17	Residential: 82 Businesses: 19 Highest Displacement of alternatives in area and requires connection Alternative EB-1 which also requires substantial displacement, particularly in the Fremont Centerville area

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)		
Category	Criteria	Measurement	EBWS-1 (CARRIED FORWARD)	EBWS-2 (CARRIED FORWARD)	EBF-1 (WITHDRAWN)
Disruption to Communities	Properties with access affected	Properties with access affected	None	One at Quarry private driveway (may not be in operation)	1 - at Quarry's private driveway (may not be in operation)
	Local traffic effects around station	Increase in traffic congestion	Increase in traffic near BART Warm Springs station. Minor increase in traffic at I-680/SR 84 junction	Increase in traffic near BART Warm Springs station. Minor increase in traffic at I-680/SR 84 junction	Replaces existing ACE service at Fremont-Centerville Station - traffic impact likely minor. Minor increase in traffic at I-680/SR 84 junction.
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	Permanent loss of traffic lanes not expected but, there may be some delays at the grade-crossing.	Permanent loss of traffic lanes not expected but, there may be some delays at the grade-crossing.
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 0.81 acres Streams: 0.15 mile	Wetlands: 3.57 acres Streams: 0.2 mile	Wetlands: 0.26 acres Stream 0.02 mile Alternative requires connecting alternative EB-1 which has substantial impacts to wetlands in the Don Edwards National Wildlife Refuge (see Table E-1)
		Critical habitat (acres) Threatened and endangered species habitat (acres)	0 acres of critical habitat 17 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 4.4 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 6 acres of habitat area with potential for presence of threatened and endangered species. Alternative requires connecting alternative EB-1 which has substantial impacts to T & E species in the Don Edwards National Wildlife Refuge (see Table E-1)
	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	1	3	0
		Archeological Sensitivity (identified as present or not previously recorded archaeological sites within ROW)	0	0	0
	Parklands	Acres of parklands within ultimate ROW	11 acres of publicly owned land and lands with public uses (includes SFPUC-owned watershed lands)	10.1 acres of publicly owned land and lands with public uses (includes part of Fremont Central Park, and SFPUC watershed land; EBRPD land crossed beneath by tunnel not included)	13.75 acres of publicly owned land and lands with public uses (includes EBRPD land crossed under by proposed tunnel and SFPUC-owned watershed lands)
	Agricultural lands	Acres of farmland Acres of land in Williamson Act <sup>1</sup> contract	Prime: 7 acres Williamson Act: 1 acre	No farmland.	Prime: 5 acres Unique: 3 acres Williamson Act: 1 acre
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 133 Institutional: 1 Medical: 1 Park: 1	Residential: 213 Business: 2 Institutional: 1 Medical: 0 School: 1 Park: 1	Residential: 273 Institutional: 1 Medical: 1 Park: 1 In combination with connecting Alternative EB-1, would have highest number of sensitive receptors between I-680/SR84 and San Jose.
	Change in visual/scenic resources	Aerial structure visible from residences along Castillejo Drive, Sabercat Court, and Sabercat Drive.	Aerial structure visible from residences along Castillejo Drive, Sabercat Court, and Sabercat Drive.	Aerial structure visible from residences west of UP Warm Springs Subdivision between Auto Mall Parkway and Washington Blvd. and from residential neighborhoods east of route between Paseo Padre Parkway and Driscoll Road. High visual impact from golf course and other areas in Fremont Central Park.	At grade structure visible from residential neighborhoods along the train tracks and from Alameda Quarries Regional Park, and an aerial structure visible from residential neighborhoods along Waach Drive and Balton Drive. In combination with connecting Alternative EB-1, would have highest number of residential receptors between I-680/SR 84 and San Jose.

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)		
Category	Criteria	Measurement	EBWS-1 (CARRIED FORWARD)	EBWS-2 (CARRIED FORWARD)	EBF-1 (WITHDRAWN)
Environmental Quality cont'd	Change in visual/scenic resources cont'd	Number of scenic roadways that cross the ROW	State Scenic Highway: I-680 State Scenic Route: SR 238 (Mission Boulevard) Local Scenic roads: Paseo Padre Parkway, Washington Boulevard	State Scenic Highways: I-680 State Scenic Route: SR 238 (Mission Boulevard) Local Scenic Roads: Paseo Padre Parkway, Stevenson Boulevard, Washington Boulevard.	State Scenic Highway: I-680, SR84.
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	Fault Crossing: 4, (Hayward, Mission, 2 crossings of the Calaveras) Alquist-Priolo Zones: Hayward, Calaveras High Landslide Susceptibility: 13 acres [NOTE: I-680/SR84 station in Calaveras fault zone]	Fault Crossing: 3, (Hayward, Calaveras, Mission) Alquist-Priolo Zones: Calaveras, Hayward High Landslide Susceptibility: 7 acres [NOTE: I-680/SR84 station in Calaveras fault zone]	Fault Crossing: 4 (Mission, Hayward, 2 crossings of the Calaveras) Alquist-Priolo Zones: Hayward, Calaveras; High Landslide Susceptibility: 7 acres [NOTE: I-680/SR84 station in Calaveras fault zone]
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100ft: 8 1/4-mi: 230	100ft: 4 1/4-mi: 303	100ft: 0 1/4-mi: 134

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

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**Table E-3  
Union City to I-680/SR 84 (Area 1.3)**

Evaluation Measure			Alternative (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)		
Category	Criteria	Measurement	EBUC-1 (WITHDRAWN)	EBUC-2 (CARRIED FORWARD)	
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	8.41	9.52	
		Route length (within option) - Miles	9.01	9.43	
	Maximize connectivity and accessibility	Intermodal connections	Does not connect directly to Union City Intermodal Station due to 800-foot separation of Niles Subdivision from the station. Connections can be made to existing BART, AC Transit and future Capitol Corridor and Dumbarton Commuter Rail) but the extensive separation will slow transfer time I-680/SR 84 Station has no existing transit service, but could have potential AC Transit or other connections.	Connects to Union City Intermodal Station (including existing BART, AC Transit and future Capital Corridor and Dumbarton Commuter Rail), I-680/SR 84 Station has no existing transit service, but could have potential AC Transit or other connections.	
			Daily Train Hours	4.76	5.40
			Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)	1.0	1.13
	Minimize operating and capital costs	Capital cost, does not include ROW	1.06	1.0	
			Acquisition cost of additional ROW	1.0	1.04
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	Substantial TOD opportunities adjacent to the future Union City Intermodal station. Alameda County prohibits residential/commercial development in adjacent areas to I-680/SR 84; therefore TOD at this station is unlikely.	Substantial TOD opportunities adjacent to the future Union City Intermodal station. Alameda County prohibits residential/commercial development in adjacent areas to I-680/SR 84; therefore TOD at this station is unlikely.	
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Not consistent with transportation and land use policies of City of Union City and City of Fremont General Plans. due to routing through residential areas. Tunnel portal would be located on open space designated land. Near I-680, route would cross at-grade through land designated for sand and gravel quarrying and could conflict with mining activity.	Generally consistent with transportation and land use policies of City of Union City and City of Fremont General Plans. Alternative would use existing railroad corridor (UP Oakland subdivision) for passenger rail uses between Union City station and near Niles Junction. Aerial section east of Niles Junction would be inconsistent with residential land use designation in this part of Fremont and tunnel portal would be located on open space designated land. Near I-680, route would cross at-grade through land designated for sand and gravel quarrying and could conflict with mining activity.	
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	4 acres south of SR 84 (Tunnel Portal)	4 acres south of SR 84 (Tunnel Portal)	
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	SR 238, SR 84	SR 238, I-680	
	Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP Niles Subdivision - route would be adjacent to UP ROW from Union City Intermodal Station to near Niles Junction.	BART, UP Oakland Subdivision - route would be within ROW from Union City Intermodal Station to Niles Junction but it is assumed Oakland Subdivision would be acquired in this area by others planning for Capitol Corridor and Dumbarton Rail services.
Disruption/relocation of existing utilities		Identify major utilities requiring relocation	No major utility conflicts identified to date.	No major utility conflicts identified to date.	
Residential and Business Displacement		Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Residential: 101; Business: 16	Residential: 18	

Evaluation Measure			Alternative (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)	
Category	Criteria	Measurement	EBUC-1 (WITHDRAWN)	EBUC-2 (CARRIED FORWARD)
Disruption to Communities	Properties with access affected	Properties with access affected	1 affected property at Quarry private driveway (may not be in operation)	1 affected property at Quarry's private driveway (may not be in operation)
	Local traffic effects around station	Increase in traffic congestion	New connection at Union City Station will likely increase local traffic in the area; traffic would be in addition to local traffic related to the existing BART station, and future traffic related to the Dumbarton/Capitol Corridor service. There would also be traffic increases around the I-680/SR84 interchange that could affect I-680, SR 84, and Calaveras Road.	New connection at Union City Station will likely increase local traffic in the area; traffic would be in addition to local traffic related to the existing BART station, and future traffic related to the Dumbarton/Capitol Corridor service. There would also be traffic increases around the I-680/SR84 interchange that could affect I-680, SR 84, and Calaveras Road.
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	Permanent loss of traffic lanes not expected. Potential for delays at the grade-crossing.	Alternative alignment travels within rail corridor or existing ROW and permanent loss of traffic lanes not expected. Potential for delays at the grade-crossing.
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 0.30 acres Streams: 0.05 miles	Wetlands: 0.40 acres Streams: 0.02 miles
		Critical habitat (acres) Threatened and endangered (T&E) species habitat (acres)	0 acres of critical habitat 14.2 acres of habitat area with potential for presence of threatened and endangered species	0 acres of critical habitat 23 acres of habitat area with potential for presence of threatened and endangered species
	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	Route crosses through Vallejo Mill Historic Park, which is a state landmark, and may contain structure elements of a historic mill.	1 previously identified historic structure in ROW
		Archeological Sensitivity (identified as present or not previously recorded archaeological sites within ROW)	Route crosses through Vallejo Mill Historic Park, which may be sensitive for historic archaeology.	None
	Parklands	Acres of parklands within ultimate ROW	15 acres of publicly owned and publicly used land (consists mostly of EBRPD Vargas Plateau unit which will be crossed under by tunnel and SFPUC owned lands in Sunol Valley; also crosses Vallejo Mill Historic Park)	15 acres of publicly owned and publicly used land (consists mostly EBRPD Vargas Plateau unit which will be crossed under by tunnel and SFPUC owned lands in Sunol Valley; also crossed portion of Alameda Quarries recreational area)
	Agricultural lands	Acres of farmland Acres of land in Williamson Act contract <sup>1</sup>	Prime: 5 acres Unique: 3 acres	Prime: 5 acres Unique: 3 acres Williamson Act: 0.94 acres
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 583 Business: 35 Institutional: 3 Parks: 1	Residential: 250 Parks: 2
	Change in visual/scenic resources	Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	Aerial structures would be visible from numerous residences adjacent to the UP Niles Subdivision and from Old Canyon Road east of Niles Junction.	Aerial structures would be visible from residences along Herringbone Way, Batton Drive, Pecan Court, Carnation Way, Gold Street, Silver Street and Rail Drive; at-grade structures are visible from Alameda Creek Quarries Regional Recreational Area, Niles Community Park, and Rancho Arroyo Park.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	State Scenic Highway: I-680 State Scenic Route: SR 238 (Mission Boulevard)	State Scenic Highways: 1-680 State Scenic Route: SR 238 (Mission Boulevard)
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	4 fault crossings (Hayward, Mission, 2 on Calaveras) Alquist-Priolo Fault Zone: Hayward, Calaveras High Landslide Susceptibility: 7 acres [NOTE: I-680/SR 84 station is in Calaveras Fault zone]	4 fault crossings (Hayward, Mission, 2 times on Calaveras) Alquist-Priolo Fault Zone: Hayward, Calaveras High Landslide Susceptibility: 7 acres [NOTE: I-680/SR 84 station is in Calaveras Fault zone]
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 0 1/4-mile: 144	100-ft. ROW: 0 1/4-mile: 119

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

**Table E-4  
Tri-Valley (Area 2)**

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)						
Category	Criteria	Measurement	TV-1 (WITHDRAWN)	TV-2a (CARRIED FORWARD)	TV-2b (CARRIED FORWARD)	TV-2c (WITHDRAWN)	TV-3 (WITHDRAWN) <sup>2</sup>	TV-4 (CARRIED FORWARD) <sup>2</sup>	
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	18.03	17.92	18.23	17.11	11.41	9.25	
		Route length (within option) - Miles	20.43	15	16	16	14	13	
	Maximize connectivity and accessibility	Intermodal connections	Bernal/I-680 - no existing connections, but possible future LAVTA/Wheels connection. Pleasanton-Dublin BART - BART, LAVTA/Wheels, County Connection (CCCTA), San Joaquin RTD, and Tri-Delta Transit. Isabel-580 - no existing connections, but possible future LAVTA/Wheels, SJRTD and Tri-Delta Transit. Vasco - existing ACE and LLNL shuttles.	Pleasanton (SP) Station - no existing service, potential future LAVTA/Wheels connection. Downtown Livermore - LAVTA/Wheels, Amtrak connector buses, Greyhound bus service. Vasco - existing ACE and LLNL shuttles.	Pleasanton (SP) Station - no existing service, potential future LAVTA/Wheels connection. Vasco - existing ACE and LLNL shuttles.	Pleasanton (UP) Station - existing LAVTA/Wheels and CCCTA connection. Vasco - existing ACE and LLNL shuttles.	Vasco - existing ACE and LLNL shuttles.	Vasco - existing ACE and LLNL shuttles.	
		Minimize operating and capital costs	Train-hours	10.2	10.15	10.33	9.70	6.47	5.24
			Operating and Maintenance (O&M) costs (relative costs associated with different options)	2.20	1.93	1.97	1.85	1.23	1.0
	Capital cost, does not include ROW	2.28 Although capital costs are in the middle range for alternatives in this area, this alternative would have segments parallel to proposed BART service which could put the ACRP and BART in competition for public transportation funding.	1.0	2.30	3.39 Highest cost of all alternatives in area.	2.07	2.99		
	Acquisition cost of additional ROW	3.42	2.12	2.11	2.12	2.35	1.0		
Land Use	Development potential for TOD within walking distance of station	Development potential for TOD within 1/2 mile of station location	Bernal/I-680 station - Large parcels of undeveloped developable land directly adjacent to site, but may require changes in local planning to facilitate higher density, etc. Dublin- Pleasanton BART - Large Parcels E. of existing TOD plus commercial land south of I-580. Isabel/I-580 - Long-term potential for at least 50 acres of undeveloped land zoned for residential at this location. Vasco (SP) - Mixed use possibilities on undeveloped land directly adjacent to station.	Pleasanton (SP) Station - no undeveloped land within 1.4 mile of site - little to no TOD potential. Downtown Livermore- Several small parcels and parking lot conversion TOD potential. Vasco (UP) - Mixed use possibilities on undeveloped land directly adjacent to station.	Pleasanton (SP) Station - no undeveloped land within 1.4 mile of site - little to no TOD potential. Vasco (UP) - Mixed use possibilities on undeveloped land directly adjacent to station.	Pleasanton (UP) Station - Large undeveloped parcel SW of station but still close to downtown. Vasco (SP) - Mixed use possibilities on undeveloped land directly adjacent to station.	Vasco (SP) - Mixed use possibilities on undeveloped land directly adjacent to station.	Vasco (UP) - Mixed use possibilities on undeveloped land directly adjacent to station.	

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)					
Category	Criteria	Measurement	TV-1 (WITHDRAWN)	TV-2a (CARRIED FORWARD)	TV-2b (CARRIED FORWARD)	TV-2c (WITHDRAWN)	TV-3 (WITHDRAWN) <sup>2</sup>	TV-4 (CARRIED FORWARD) <sup>2</sup>
Land Use cont'd	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Use of I-680 and I-580 consistent with use of existing transportation corridor. Other land use inconsistencies where route is located outside of existing freeway ROWs in land designated for residential, commercial, recreational or other uses. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion on the I-580 corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands. Consistent with Pleasanton and Livermore General Plans. Consistent with Cities' plans to promote ACE service via 580/680 corridor and connections to other operators, such as BART.	Use of former SP route consistent with planned use of former rail corridor in general. Inconsistent with Pleasanton plans for downtown area including adjacent local park. Inconsistent in downtown Livermore where aerial ROW crosses areas north of UP ROW. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses. Consistent with Livermore General Plan. Generally consistent with the general plan's overall goal of supporting regional rail systems to serve Livermore. Inconsistent, City of Pleasanton General Plan. Inconsistent with proposed use via former SP through downtown rail as it does not meet the City's goal of supporting extension of regional (and high speed) rail on the existing ACE corridor (GP Goal 4, Policies 14 and 19). Inconsistent, City of Pleasanton Downtown Specific Plan. The Pleasanton Downtown Specific Plan focused on maintaining pedestrian character of the area, which would preclude the development of a regional rail line via the former SP. Also inconsistent with intent of Plan as related to Alameda County Transportation Corridor. County has considered corridor for light rail use. Plan calls for development of parking uses, bicycle and pedestrian trails. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion in Altamont corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands.	Use of former SP route consistent with planned use of former rail corridor. Use of tunnel through downtown Pleasanton and Livermore minimizes land use inconsistency with overlying land. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses. Consistent with Livermore General Plan. Generally consistent with the general plan's overall goal of supporting regional rail systems to serve Livermore. Inconsistent, City of Pleasanton General Plan. Inconsistent with proposed use via former SP through downtown rail as it does not meet the City's goal of supporting extension of regional (and high speed) rail on the existing ACE corridor (GP Goal 4, Policies 14 and 19). Inconsistent, City of Pleasanton Downtown Specific Plan. The Pleasanton Downtown Specific Plan focused on maintaining pedestrian character of the area, which would preclude the development of a regional rail line via the former SP. Also inconsistent with intent of Plan as related to Alameda County Transportation Corridor. County has considered corridor for light rail use. Plan calls for development of parking uses, bicycle and pedestrian trails. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion in Altamont corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands.	Use of UP route in Pleasanton consistent with existing use of corridor with accommodation for freight. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses. Consistent with Livermore General Plan. Generally consistent with the general plan's overall goal of supporting regional rail systems to serve Livermore. Consistent, City of Pleasanton General Plan. Avoids use of former SP through downtown Pleasanton and maintains ACE services on existing UP line. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion in Altamont corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands.	Location adjacent to SR84 consistent in general with use of existing transportation corridor, but inconsistent with open space designations in County land use plan outside the road ROW. Use of tunnel in downtown Livermore minimizes conflict with overlying land uses. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses. Potentially Inconsistent, City of Livermore General Plan and South Livermore Specific Plan. Generally consistent with the general plan's overall goal of supporting regional rail systems to serve Livermore. But alignment does not support goals to provide transportation in Livermore that avoids land use conflicts, especially maintaining "wine country character" and further environmental impacts where route crosses through open space and sensitive habitats in south Livermore. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion in Altamont corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands.	New transportation corridor inconsistent with open space designations in County land use plan (ECAP). Inconsistent use with Sycamore Grove Park. Aerial route along Vasco Road could create potential compatibility issues with adjacent residential areas. Other land use inconsistencies where route is located outside of existing rail ROWs in land designated for residential, commercial, park, industrial or other uses. Potentially Inconsistent, City of Livermore General Plan and South Livermore Specific Plan. Generally consistent with the general plan's overall goal of supporting regional rail systems to serve Livermore. But alignment does not support goals to provide transportation in Livermore that avoids land use conflicts, especially maintaining "wine country character" and further environmental impacts where route crosses through open space and sensitive habitats in south Livermore. Inconsistent with ECAP. In general ECAP does not preclude new rail capacity to help reduce traffic congestion in Altamont corridor, but rail alignment would be inconsistent with open space and agricultural designations where route cross such designated lands.

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)					
Category	Criteria	Measurement	TV-1 (WITHDRAWN)	TV-2a (CARRIED FORWARD)	TV-2b (CARRIED FORWARD)	TV-2c (WITHDRAWN)	TV-3 (WITHDRAWN) <sup>2</sup>	TV-4 (CARRIED FORWARD) <sup>2</sup>
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	14 acres Access within active freeway ROWs will be challenging.	17 acres	17 Acres	17 Acres	17 acres	17 Acres
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	I-680, I-580, SR 84 Construction through extensive parts of I-680/I-580 poses high constructability risks.	I-680, SR 84	I-680, SR 84	I-680, SR 84	SR-84	SR-84
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP, BART	UP	UP	UP Only alternative located within active UP ROW with substantial constructability risk. Difficulty to get UPRR agreement to alternative, establish operating agreement, and/or obtain ROW necessary to implement.	UP	UP
	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	Sewer Line along I-580 but practicable to relocate.	Storm Drain Line in downtown Pleasanton, Overhead Electrical, storm drains and water mains in Livermore but practicable to relocate.	Storm drain in Pleasanton, Storm Drains, water mains, and sanitary sewer in Livermore but all practicable to relocate.	Storm drain in Pleasanton, overhead electrical and storm drains in Livermore, but practicable to relocate.	Storm Drains, water main, and sanitary sewer in downtown Livermore but practicable to relocate.	Storm Drain and sewer lines along Vasco Road, but practicable to relocate.
	Residential and Business Displacement	Potential impact on properties due to ultimate ROW requirements and grade separations	Residential: 2 Business: 8 Total: 10	Residential: 40 Business: 41 Total: 81	Residential: 0 Business: 6 Total: 6	Residential: 0 Business: 7 Total: 7	Residential: 2 Business: 7 Total: 9 Alternative routed through private quarry land south of Stanley Boulevard with associated high risk or ROW acquisition due to significant mineral resources	Residential: 0 Business: 0 Total: 0
Disruption to Communities	Properties with access affected	Properties with access affected	No conflict	9 properties with access affected	4 properties with access affected	7 properties with access affected	4 properties with access affected	1 property with access affected
	Local traffic effects around station	Increase in traffic congestion	Bernal station: moderate increase in local traffic in vicinity of I-680/Bernal interchange (due to park & ride potential); Pleasanton/Dublin Station: New station will increase local traffic in addition to BART traffic. Replaces existing ACE service at Vasco station – traffic impact moderate due to park & ride potential	New station – will increase local traffic adjacent to residential area. Replaces existing ACE service Vasco Station– traffic impact moderate due to park & ride potential	New station – will increase local traffic adjacent to residential area.	Replaces existing ACE service at Vasco Station – traffic impact moderate due to park & ride potential	Replaces existing ACE service at Vasco Station – traffic impact moderate due to park & ride potential.	Replaces existing ACE service at Vasco Station – traffic impact moderate due to park & ride potential.

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)					
Category	Criteria	Measurement	TV-1 (WITHDRAWN)	TV-2a (CARRIED FORWARD)	TV-2b (CARRIED FORWARD)	TV-2c (WITHDRAWN)	TV-3 (WITHDRAWN) <sup>2</sup>	TV-4 (CARRIED FORWARD) <sup>2</sup>
Disruption to Communities cont'd	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	No Conflict	Contractor's Place needs to be closed; new access will be via the parking space north	Contractor's Place needs to be closed; new access will be via the parking space north. Vasco Road (6 lanes) needs to be grade separated either by an overcrossing or undercrossing.	Contractor's Place needs to be closed; new access will be via the parking space north. Vasco Road (6 lanes) needs to be grade separated either by an overcrossing or undercrossing.	Contractor's Place needs to be closed; new access will be via the parking space north. Vasco Road (6 lanes) needs to be grade separated either by an overcrossing or undercrossing.	No conflict
Environmental Resources	Waterways and Wetlands and Natural Preserves or Biologically Sensitive Habitat Areas Affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 1 acre Streams: 0.43 mile	Wetlands: 0.49 acres Streams: 0.16 mile	Wetlands: 0.47 acres Streams: .014 mile	Wetlands: 0.17 acres Streams: 0.28 mile	Wetlands: 2.65 acres (highest wetland impact of all area alternatives) Streams: 0.23 mile	Wetlands: 1.3 acres Streams: 0.24 mile
		Critical habitat (acres) Threatened and endangered (T&E) species habitat (acres)	0 acres of critical habitat 95 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 47 acres of habitat area with potential for presence of threatened and endangered species.	Critical Habitat: 0 acres of critical habitat 45 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 42 acres of habitat area with potential for presence of threatened and endangered species.	0 acres of critical habitat 59 acres of habitat area with potential for presence of threatened and endangered species.	9 acres of critical habitat 73 acres of habitat area with potential for presence of threatened and endangered species.
	Cultural Resources	Number of (previously recorded) historic structures within ultimate ROW	2	1	1	2	0	0
		Archeological Sensitivity (present and previously recorded and/or not previously recorded archaeological sites)	0	2	2	3	0	0
		Acres of parklands within ultimate ROW	29 acres (all SFPUC watershed lands near Sunol)	30 acres (mostly SFPUC watershed lands near Sunol)	29 acres (mostly SFPUC watershed lands near Sunol)	29 acres (all SFPUC watershed lands near Sunol)	18 acres (mostly SFPUC Watershed land near Sunol)	17 acres of uses (all SFPUC watershed land) above ground. Alternative crosses under >1 mile of Sycamore Grove Regional Park, but in tunnel.
	Agricultural Lands	Acres of farmland Acres of land in Williamson Act <sup>1</sup> contract	Williamson Act: 12 acres Prime: 0.79 acres	Williamson Act: 0.5 acres Prime: 0.79 acres	Williamson Act 0.50 acres Prime: 0.79 acres	Prime: 0.79 acres	Williamson Act: 22 acres Prime: 9 acres Statewide Importance: 0.9 acres Highest farmland impacts of all area alternatives (in vineyard areas south of Livermore)	Williamson Act: 34 acres Prime: 0.79 acres Statewide Importance: 4 acres Unique: 2 acres
Environmental Measures	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 371 Institutional: 3 School: 2 Parks: 3	Residential: 504 Medical: 2 Parks: 6	Residential: 17	Residential: 26 Institutional: 1 School: 2 Parks: 3	Residential: 163 Institutional: 1 Medical: 2 Parks: 3	Residential: 5 Institutional: 0 Medical: 0 Parks: 0

Evaluation Measure			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)					
Category	Criteria	Measurement	TV-1 (WITHDRAWN)	TV-2a (CARRIED FORWARD)	TV-2b (CARRIED FORWARD)	TV-2c (WITHDRAWN)	TV-3 (WITHDRAWN) <sup>2</sup>	TV-4 (CARRIED FORWARD) <sup>2</sup>
Environmental Measures cont'd	Change in visual/scenic resources	Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	By routing along freeways, alternative would not introduce new features within Pleasanton or Livermore residential areas. However aerial segments along I-680 and I-580 would affect scenic views of adjacent hill areas along portions of freeways. In certain areas, the alignment will be visible from adjacent residential and park areas near the freeway.	Substantial visual impacts in downtown Pleasanton and Livermore with high visibility from adjacent residential and commercial areas, including in both downtown areas. Also visible from other residential areas outside of both downtown areas.	Use of tunnels minimizes visual impacts in downtown Pleasanton and Livermore. Outside of downtown areas, aerial sections will be visible from certain adjacent residential and park areas.	Use of tunnels minimizes visual impacts in downtown Pleasanton and Livermore. Outside of downtown areas, aerial sections will be visible from certain adjacent residential and park areas. Alternative has benefit of removing surface freight travel near downtown Pleasanton.	South of Pleasanton, new alignment would affect visual aesthetics along SR84 and views of open space. Would also affect views from residences in south Pleasanton (Ruby Hill) and western Livermore. Tunnel would minimize visual in downtown Livermore. Visible from certain residential areas east of downtown Livermore.	South of Pleasanton, new alignment would affect visual aesthetics along SR84 and views of open space. South Livermore retained cut sections would change existing views of agricultural lands from residences along Silverado Rd and Silverado Court. Aerial portions would be visible from William Payne Sports Park.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	Scenic Highway: I-680 (Caltrans) Scenic Corridor: I-580 (Livermore) Local Scenic Road: Paloma Road (Alameda County)	Scenic Highway: I-680 (Caltrans) Local Scenic Road: Paloma Road (Alameda County) Patterson Pass Road (Livermore)	Scenic Highway: I-680 (Caltrans)	Scenic Highway: I-680 (Caltrans)	Scenic Highway: I-680 (Caltrans) Local Scenic Roads: Vallecitos Road (Alameda County), Isabel Avenue (Livermore)	Scenic Highway: I-680 (Alameda County), Tesla Road (Alameda County), Patterson Pass Road (Livermore)
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	Fault crossings: 4 (Calaveras, Pleasanton, Livermore, Mocho) Fault zones: 1 (Calaveras) High Landslide Susceptibility: 99 acres	Fault crossings: 2 (Calaveras, Pleasanton) Alquist-Priolo Fault zones: 1 (Calaveras)	Fault crossings: 3 (Calaveras, Pleasanton, Livermore) Alquist-Priolo Fault zones: 1 (Calaveras)	Fault crossings: 3 (Calaveras, Pleasanton, Livermore) Alquist-Priolo Fault zones: 1 (Calaveras)	Fault crossings: 3 (Calaveras, Verona, Livermore) Alquist-Priolo Fault zones: 2 (Calaveras, Verona) High Landslide Susceptibility: 1.2 acres	Fault crossing(s): 4 (Calaveras, Las Positas (two locations), Verona) Alquist Priolo Fault Zones: 3 (Calaveras, Verona, Las Positas) High landslide susceptibility: 17 acres
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 11 1/4-mile: 602	100-ft. ROW: 34 1/4-mile: 724	100-ft. ROW: 114 1/4-mile: 722	100-ft. ROW: 19 1/4-mile: 728	100-ft. ROW: 86 1/4-mile: 474	100-ft. ROW: 1 1/4-mile: 64

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

<sup>2</sup> Alternatives TV-3 and TV-4's summary results are with the segment option "84a" only, as it represents the worst case scenario.

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**Table E-5  
Altamont Pass (Area 3)**

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)	
Category	Criteria	Measurement	A-1 (CARRIED FORWARD)	A-2 (CARRIED FORWARD)
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	5.99	5.50
		Route length (within option) - Miles	13.58	12.30
	Maximize connectivity and accessibility	Intermodal connections	No stations or any direct connections to other transit operators in alignment.	No stations or any direct connections to other transit operators in alignment.
		Minimize operating and capital costs	Daily Train Hours	3.59
	Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)		1.08	1.00
	Capital cost, does not include ROW		1.24	1.0
	Acquisition cost of additional ROW	1.58	1.0	
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	No stations in alignment.	No stations in alignment.
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	<p>City of Livermore General Plan - Consistent (Transportation System). The GP promotes alternative transportation modes (Goal CIR-3, Objective CIR-3.10). Goal CIR-7, Objective CIR-7.1, supports a well-coordinated regional transportation system that serves Livermore and the surrounding region.</p> <p>East County Area Plan - Inconsistent. The ECAP designates the land along the proposed alignment east of Livermore as "Large Parcel Agriculture." This designation does not specifically permit transportation or rail uses. Policy 177 of the ECAP states that improvements that would expand the capacity of the Altamont Pass and Vasco Road gateways leading into the planning area from San Joaquin and Contra Costa Counties would be inconsistent with the policies of the plan. However, Policy 177 specifically notes that "This policy shall not preclude the County from supporting or approving any rail projects or improvements required for roadway safety." Thus, the project would be inconsistent with the land use designations but with the overall intent of the plan as it relates to transportation.</p> <p>Alameda County Countywide Transportation Plan - Consistent. The Plan identifies the following performance objective to reduce automobile trips, maintain clean air, and reduce greenhouse gases: A transportation system that enables and encourages an increased share of commute trips to be made by commuter rail, mass transit, carpool, vanpool, walking, or bicycle.</p> <p>San Joaquin County General Plan - Consistent (Transportation). The General Plan states that one of its long-term goals is to upgrade the rail service between the County and Sacramento, the Bay Area, and Los Angeles to competitive 125-mile-per-hour service on existing or new alignments (IV. Community Development, F. Transportation, 4. Public Mass Transit, Policy #10), with the ultimate goal of providing very high speed (185 mph) interregional rail service.</p> <p>San Joaquin County Regional Transportation Plan - Consistent. The RTP broadly supports region wide planning efforts that would increase accessibility to passenger rail service. The RTP states that the Central Valley passenger rail system "should be designed to fully integrate the larger intermodal passenger transportation network including multimodal stations that provide convenient and direct access to all appropriate state, regional, and local modes, including, where</p>	<p>City of Livermore General Plan - Consistent (Transportation System). The GP promotes alternative transportation modes (Goal CIR-3, Objective CIR-3.10). Goal CIR-7, Objective CIR-7.1, supports a well-coordinated regional transportation system that serves Livermore and the surrounding region.</p> <p>East County Area Plan - Inconsistent. The ECAP designates the land along the proposed alignment east of Livermore as "Large Parcel Agriculture." This designation does not specifically permit transportation or rail uses. Policy 177 of the ECAP states that improvements that would expand the capacity of the Altamont Pass and Vasco Road gateways leading into the planning area from San Joaquin and Contra Costa Counties would be inconsistent with the policies of the plan. However, Policy 177 specifically notes that "This policy shall not preclude the County from supporting or approving any rail projects or improvements required for roadway safety." Thus, the project would be inconsistent with the land use designations but with the overall intent of the plan as it relates to transportation.</p> <p>Alameda County Countywide Transportation Plan - Consistent. The Plan identifies the following performance objective to reduce automobile trips, maintain clean air, and reduce greenhouse gases: "A transportation system that enables and encourages an increased share of commute trips to be made by commuter rail, mass transit, carpool, vanpool, walking, or bicycle."</p> <p>San Joaquin County General Plan - Consistent (Transportation). The General Plan states that one of its long-term goals is to upgrade the rail service between the County and Sacramento, the Bay Area, and Los Angeles to competitive 125-mile-per-hour service on existing or new alignments (IV. Community Development, F. Transportation, 4. Public Mass Transit, Policy #10), with the ultimate goal of providing very high speed (185 mph) interregional rail service.</p> <p>San Joaquin County Regional Transportation Plan - Consistent. The RTP broadly supports region wide planning efforts that would increase accessibility to passenger rail service. The RTP states that the Central Valley passenger rail system "should be designed to fully integrate the larger intermodal passenger transportation network including multimodal stations that provide convenient and direct access to all appropriate state, regional, and local modes, including, where</p>

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)	
Category	Criteria	Measurement	A-1 (CARRIED FORWARD)	A-2 (CARRIED FORWARD)
			applicable, urban commuter, inter-city and high speed rail service, regional and local bus service, airport shuttle services, and other feeder serviced that provide intermodal linkage."	applicable, urban commuter, inter-city and high speed rail service, regional and local bus service, airport shuttle services, and other feeder serviced that provide intermodal linkage."
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	8 ac at Jess Ranch Road	10 ac at Patterson Pass Road
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	I-580	I-580
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP	UP and proposed BART overcrossing at west end
	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	Data not available.	Data not available.
	Residential and Business Displacement	Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Business: 2	Business: 2
Disruption to Communities	Properties with access affected	Properties with access affected	Access may be affected for rural parcels but alternative access can be provided as necessary	2 Industrial Properties affected. Access may be affected for rural parcels but alternative access can be provided as necessary
	Local traffic effects around station	Increase in traffic congestion	No stations in alignment.	No stations in alignment.
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	No conflict	No conflict
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 3 acres Streams: 0.70 miles	Wetlands: 0.70 acres Streams: 0.30 miles
		Critical habitat (acres) Threatened and endangered species habitat (acres)	27 acres of critical habitat that may support threatened or endangered species is present. 95 acres of habitat area with potential for presence of threatened and endangered species	92 acres of critical habitat that may support threatened or endangered species is present. 121 acres of habitat area with potential for presence of threatened and endangered species
	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	5	0
		Archeological Sensitivity (presence of previously recorded and/or not previously recorded archaeological sites within ROW)	0	0
	Parklands	Acres of parklands within ultimate ROW	0 acres	No Parklands. However, alignment crosses 11 acres of proposed mitigation area/species conservation area on eastern side.
	Agricultural lands	Acres of farmland Acres of land in Williamson Act contract <sup>1</sup>	Prime: 14 acres Unique: 0.10 acres Locally Important: 13 acres Williamson Act: 37 acres	Locally Important: 8 acres Williamson Act: 89 acres
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	0	0
	Change in visual/scenic resources	Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	Aerial or at-grade structures would not be visible from a residence or park.	Aerial, retained cut and at-grade structures would not be visible from a residence or park.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	Scenic Highways: I-580 Scenic Roadways: Greenville Road, Flynn Road, Patterson Pass Road	Scenic Highways: I-580 Scenic Roadways: Greenville Road, Flynn Road, Patterson Pass Road
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	2 Fault Crossings (Greenville, Midway) Alquist-Priolo Zone: Greenville High landslide susceptibility: 11 acres	2 Fault Crossings (Greenville, Midway) Alquist-Priolo Zone: Greenville High landslide susceptibility: 66 acres
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100 ft: 0 1/4 mi: 43	100 ft: 0 1/4 mi: 29

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

**Table E-6  
Tracy (Area 4.1)**

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)	
Category	Criteria	Measurement	T-1 (CARRIED FORWARD)	T-2 (CARRIED FORWARD)
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	6.26	7.46
		Route length (within option) - Miles	8.88	11.37
	Maximize connectivity and accessibility	Intermodal connections	Connection to Tracy Transit Station, Tracer Bus, and SJRTD	No direct connections to other transit operators at South Tracy Station.
	Minimize operating and capital costs	Daily Train Hours	3.5	4.2
		Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)	1.00	1.19
		Capital cost, does not include ROW	1.35	1.0
Acquisition cost of additional ROW		1.0	1.07	
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	Good potential for TOD exists in downtown Tracy.	Available vacant land near South Tracy station, but possibility of TOD is very low because would likely require travel by car to and from site into Tracy.
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Tracy General Plan, Tracy Short-range Transit Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan supportive of extensions of interregional passenger rail service. Tracy Short-Range Transit Plan shows future ACRE rail service through downtown Tracy. Tracy General Plan - There will likely be several inconsistencies where the route near downtown crosses low-density residential or central business district - designated areas. San Joaquin County General Plan - Inconsistent with land use policies for agricultural land crossed.	Tracy General Plan, Tracy Short-Range Transit Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan supportive of extensions of interregional passenger rail service. However, the Tracy Short-Range Transit Plan does not show a future ACE rail corridor south of downtown. Tracy General Plan - There will likely be several inconsistencies where the route crosses several industrial-designated properties. San Joaquin County General Plan - Inconsistent with land use policies for agricultural land crossed.
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	7 acres	7 acres
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	I-205 to remain at existing grade, and rail to cross at grade (maintain existing grade separation)	None
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP	UP
	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	Delta-Mendota Canal (While this alternative does not cross the Delta-Mendota aqueduct, it starts just east of the aqueduct, it's connecting alternative ALT-1 does cross the aqueduct, so this alternative would require a canal crossing like T-2).	Crosses Delta-Mendota aqueduct
	Residential and Business Displacement	Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	None	None
Disruption to Communities	Properties with access affected	Properties with access affected	None	None
	Local traffic effects around station	Increase in traffic congestion	New Tracy station may increase local traffic in downtown area	Replaces existing ACE service at Tracy station - traffic impact likely minor
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	Two of the existing rural at-grade crossings may be kept. Other existing at-grade crossings will be grade separated in this alignment.
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 0 acres Stream: 0.04 miles	Wetlands: 1.97 acres Stream: 0.02 miles
		Critical habitat (acres) Threatened and endangered (T&E) species habitat (acres)	0.21 acres of critical habitat that may support threatened or endangered species is present. 4 acres of habitat area with potential for presence of threatened and endangered species	0.51 acres of critical habitat that may support threatened or endangered species is present. 14 acres of habitat area with potential for presence of threatened and endangered species

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)	
Category	Criteria	Measurement	T-1 (CARRIED FORWARD)	T-2 (CARRIED FORWARD)
Environmental Resources cont'd	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	4	2
		Archeological Sensitivity (presence of previously recorded and/or not previously recorded archaeological sites within ROW)	0	0
	Parklands	Acres of parklands within ultimate ROW	0 acres	9 acres (consists of State Lands Commission land east of I-5 - not an active park)
	Agricultural lands	Acres of farmland Acres of land in Williamson Act contract <sup>1</sup>	Prime: 36 acres Unique: 8 acres Williamson Act: 0.24 acres	Prime: 59 acres Unique: 0.4 acres Locally important: 23 acres Williamson Act: 21 acres
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 587 Institutional: 1 Parks: 2	Residential: 178 Parks: 2
		Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	Aerial structure would be visible from the residences along 6th Streets and adjacent to the UP alignment, and from Joan Sparks Park.	Aerial structure would be visible from Don Close Park and Veterans Park and residences along West Linne Road, Falcone Drive, and Depot Master Drive.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	0	0
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	1 fault crossing (unnamed)	1 fault crossing (unnamed)
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 2 1/4-mile: 150	100-ft. ROW: 17 1/4-mile: 185

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

**Table E-7  
San Joaquin River to Stockton (Area 4.2)**

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TS-1 (CARRIED FORWARD)	TS-2 (WITHDRAWN)	TS-3 (CARRIED FORWARD)	TS-4 (CARRIED FORWARD)
Design Objectives	Maximize ridership/ revenue potential	Travel time (within option) - Minutes	9.18	9.28	10.28	10.15
		Route length (within option) - Miles	13.79	14.11	14.95	15.06
	Maximize connectivity and accessibility	Intermodal connections	Connects to HST, Sac-Merced Regional, Amtrak, and SJRTD at Stockton Station. Likely able to connect to SJRTD at new Lathrop/I-5 station.	Connects to HST, Sac-Merced Regional, Amtrak, and SJRTD at Stockton Station. Likely able to connect to SJRTD at new Lathrop- Manteca station.	Connects to HST, Sac-Merced Regional, Amtrak, and SJRTD at Stockton Station. Likely able to connect to SJRTD at new Lathrop- Manteca station.	Connects to HST, Sac-Merced Regional, Amtrak, and SJRTD at Stockton Station. Likely able to connect to SJRTD at new Lathrop- Manteca station.
		Minimize operating and capital costs	Daily Train Hours	5.2	5.3	5.8
	Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train- hour and 17 RT per day)		1.00	1.01	1.12	1.10
	Capital cost, does not include ROW		1.06	1.08 Although capital cost of ACRP alternative is only slightly higher than other alternatives in this area, this alternative would not allow for a combined ACRP/HST alignment through Lathrop/Manteca. Using average capital cost per mile for the ACRP, the redundant 7-mile segment could cost hundreds of millions of dollars more than the other alternatives.	1.0	1.01
	Acquisition cost of additional ROW	1.0	1.02	1.08	1.09	
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	There is developable land adjacent to the Lathrop/I-5 station, west of the freeway. However, there is favorable potential for TOD at Downtown Stockton ACE (Cabral).	In the vicinity of Louise Avenue, there are large-scale stable industrial uses that set a non-residential context, although there is interspersed developable land. However, there is favorable potential for TOD at Downtown Stockton ACE (Cabral).	There are a number of undeveloped parcels outside Lathrop/Manteca (West Yosemite Avenue), but this is outside of built up parts of Lathrop/Manteca, so TOD would be isolated. However, there is favorable potential for TOD at Downtown Stockton ACE (Cabral).	There are a number of undeveloped parcels outside Lathrop/Manteca (West Yosemite Avenue), but this is outside of built up parts of Lathrop/Manteca, so TOD would be isolated. However, there is favorable potential for TOD at Downtown Stockton ACE (Cabral).
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Lathrop General Plan, Stockton General Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Although the Lathrop GP does not specify use of I-5 corridor for rail; as a state ROW it is available for transportation purposes. There will be certain inconsistencies in the southern part of Lathrop with placing a new ROW outside of the I-5 corridor on lands designated for commercial, urban reserve, recreation or other uses and in the southern part of Stockton where acquiring ROW for rail on industrial-designated lands. San Joaquin County General Plan - Inconsistent with land use policies for agricultural land crossed.	Lathrop General Plan, Stockton General Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Lathrop GP specifically mentions use of the former SP route for rail connections. There will be certain inconsistencies in the southern part of Lathrop with placing a new ROW outside of the former SP corridor on lands designated for commercial, recreation or other uses. San Joaquin County General Plan - Inconsistent with land use policies for agricultural land crossed.	Manteca General Plan, Stockton General Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Manteca GP encourages passenger rail service that benefits Manteca. San Joaquin County General Plan - inconsistent with land use policies for agricultural land crossed. There will be certain inconsistencies in the west part of Manteca with placing a new ROW outside of the UP corridor on lands designated for industrial, public/quasi public, residential, or other uses and the southern part of Stockton where acquiring ROW for rail on industrial, residential or "village" designated properties. San Joaquin County General Plan - Inconsistent with land use policies for agricultural land crossed.	Manteca General Plan, Stockton General Plan, San Joaquin General Plan, and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Manteca GP encourages passenger rail service that benefits Manteca. San Joaquin County General Plan - inconsistent with land use policies for agricultural land crossed. There will be certain inconsistencies in the west part of Manteca with placing a new ROW outside of the UP corridor on lands designated for industrial, public/quasi public, residential, or other uses and the southern part of Stockton where acquiring ROW west of the airport on industrial, residential or "village" designated properties and on commercial property near Charter Way.

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TS-1 (CARRIED FORWARD)	TS-2 (WITHDRAWN)	TS-3 (CARRIED FORWARD)	TS-4 (CARRIED FORWARD)
Land Use cont'd	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	6 acres	12 acres	8 acres	8 acres
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	I-5, SR 4	SR 120, SR 4	SR 120, SR 4	SR 120, SR 4
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP, including two rail yards. Risk of acquisition of ROW or lease arrangement from UP in two rail yards.	UP, including two rail yards. Risk of acquisition of ROW or lease arrangement from UP in two rail yards.	UP, including two rail yards. Risk of acquisition of ROW or lease arrangement from UP in two rail yards.	UP
Constructability cont'd	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	High-voltage power line	High-voltage power line	High-voltage power line	High-voltage power line
	Residential and Business Displacement	Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Residential: 1 Business: 12	Business: 11	Residential: 1 Business: 9	Residential: 9 Business: 19
Disruption to Communities	Properties with access affected	Properties with access affected	None	None	None	None
	Local traffic effects around station	Increase in traffic congestion	Increased traffic at I-5/Lathrop Rd interchange to access new station. Other station (Cabral) traffic increases likely minor.	Increased local traffic along Louise and Lathrop Rd near (with new Lathrop-Manteca station). Other station (Cabral) traffic increases likely minor.	Increased local traffic along Lathrop Rd near (with new station at W. Yosemite). Other station (Cabral) traffic increases likely minor.	Increased local traffic along Lathrop Rd near (with new station at W. Yosemite). Other station (Cabral) traffic increases likely minor.
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	None	Traffic delays at Ross Road at-grade crossing may increase.	Traffic delays at Ross Road may increase
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 1.5 acres Streams: 0.14 miles	Wetlands: 0.86 acres Streams: 0.10 miles	Wetlands: 0.81 acres Streams: 0.15 miles	Wetlands: 0.81 acres Streams: 0.07 miles
		Critical habitat (acres) Threatened and endangered (T&E) species habitat (acres)	1.0 acres of critical habitat that may support threatened or endangered species is present. 45 acres of habitat area with potential for presence of threatened and endangered species	0.72 acres of critical habitat that may support threatened or endangered species is present. 52 acres of habitat area with potential for presence of threatened and endangered species. Additional impact due to 7-mile redundant segment.	0.72 acres of critical habitat that may support threatened or endangered species is present. 115 acres of habitat area with potential for presence of threatened and endangered species.	0.72 acres of critical habitat that may support threatened or endangered species is present. 116 acres of habitat area with potential for presence of threatened and endangered species.
	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	3	3 Additional impact due to 7-mile redundant segment.	8	6
		Archeological Sensitivity (identified as present or not previously recorded archaeological sites within ROW)	1	1	0	0

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TS-1 (CARRIED FORWARD)	TS-2 (WITHDRAWN)	TS-3 (CARRIED FORWARD)	TS-4 (CARRIED FORWARD)
Environmental Resources cont'd	Parklands	Acres of parklands within ultimate ROW	2 acres (Mossdale Crossing Regional Park)	0 acres	0 acres	0 acres
	Agricultural lands	Acres of farmland Acres of land in Williamson Act contract <sup>1</sup>	Prime: 7 acres Statewide Importance: 1 acre Local Importance: 7 acres	Prime: 9 acres Statewide Importance: 12 acres Local Important: 3 acres Additional impact due to 7-mile redundant segment.	Prime: 43 acres Statewide Importance: 26 acres Local Importance: 21 acre Animal Agriculture: 0.70 acre Williamson Act: 0.01 acre	Prime: 37 acres Local Importance: 17 acre Statewide Importance: 26 acres Animal Agriculture: 0.70 acre
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 208 Institutional: 3 Parks: 3	Residential: 260 Institutional: 4 School: 1 Parks: 3	Residential: 94 Institutional: 1 Parks: 2	Residential: 216 Institutional: 3 Parks: 3
		Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	The aerial structure would be visible from residences along South Harian Road, the Head Start Child Development facility and the Sahib Sikh Temple, and an institution along South Harian Road.	The aerial structure would be visible from residences along the train tracks, along Mingo Way, South McKinley Avenue, South Harian Road, the Head Start Child Development facility, Sahib Sikh Temple, Woodfield Park, Union Square Park, and Constitution Park.	This alternative would be visible from residences along Fisk Road and East French Camp Road, Head Start Child Development Facility, Sahib Sikh Temple, and Union Square Park and Constitution Park.	The aerial structure would be visible from residences along South Airport Way, Fisk Road, East French Camp Road, South Union Street, Williams Brotherhood Park, Union Square Park, Constitution Park, and an institutional long South Union Street.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	0	0	0	0
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	0	0	0	0
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 58 1/4-mile: 716	100-ft. ROW: 18 1/4-mile: 756 Additional impact due to 7-mile redundant segment.	100-foot ROW: 18 1/4-mile: 615	100-ft. ROW: 51 1/4-mile: 593

Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

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**Table E-8  
San Joaquin River to Ripon/Escalon Vicinity (Area 4.3)**

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TM-1a (WITHDRAWN)	TM-1b (CARRIED FORWARD)	TM-2a (CARRIED FORWARD)	TM-2b (CARRIED FORWARD)
Design Objectives	Maximize ridership/revenue potential	Travel time (within option) - Minutes	9.60	13.33	8.77	6.12
		Route length (within option) - Miles	13.92	21.77	18.55	9.94
	Maximize connectivity and accessibility	Intermodal connections	Connects to HST, Sac-Merced Regional, and MAX at downtown Modesto Station. Likely able to connect to SJRTD at new Lathrop-Manteca station.	Connects to HST, Sac-Merced Regional, and MAX at Modesto Station. Likely able to connect to SJRTD at new Lathrop-Manteca station.	Connects to HST, Amtrak and MAX at Modesto (BNSF) Station. Connects to Sac-Merced Regional at Manteca/SR120 station.	Connects to HST, Sac-Merced Regional, and MAX at Modesto Station. Connects to Sac Merced Regional at Manteca/ SR120 station
		Minimize operating and capital costs	Daily Train Hours	5.4	7.6	5.0
	Daily Operating and Maintenance (O&M) costs (based on \$1,500 per train-hour and 17 RT per day)		1.56	2.17	1.43	1.0
	Capital cost, does not include ROW		1.05 Although alternative is only slightly more cost than the other alternatives connecting to the HST route adjacent to the UPRR/SR-99, this alternative would require redundant ACRP and HST alignments through the Lathrop/Manteca area. The capital cost of the additional 7-miles of route could add hundreds of millions to the resultant cost.	1.0	1.30	1.01
	Acquisition cost of additional ROW	1.4	2.19	1.01	1.0	
Land Use	Development potential for TOD within walking distance	Development potential for TOD within 1/2 mile of station location	Within a 1/2 mile of the future Lathrop/Manteca (Louise Avenue) station are large-scale stable industrial uses that set a non-residential context even though there is interspersed developable land. The TOD potential is limited.	Near the future Lathrop/Manteca (West Yosemite Avenue) station are a number of undeveloped parcels, but this area is outside of developed areas of Lathrop or Manteca, so TOD uses would be isolated. Therefore, the TOD potential is limited.	There are large parcels south of the SR 120 but not near downtown Manteca where TOD uses exist. However, with available development lands, there is still TOD potential.	There are large parcels south of the SR 120 but not near downtown Manteca where TOD uses exist. However, with available development lands, there is still TOD potential.
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Lathrop General Plan, Manteca General Plan, City of Ripon General Plan, San Joaquin General Plan and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Lathrop GP encourages use of former SP ROW. Manteca GP encourages passenger rail service that benefits Manteca. There will be certain inconsistencies in the southern part of Lathrop with placing a new ROW outside of the former SP corridor on lands designated for commercial, recreation or other uses. There will be inconsistencies with land use designation in Manteca where acquiring property in residential, commercial, and industrial areas adjacent to the UP corridor through the middle of Manteca. San Joaquin County General Plan - inconsistent with land use policies for agricultural land crossed.	Lathrop General Plan, Manteca General Plan, City of Ripon General Plan, and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Manteca GP encourages passenger rail service that benefits Manteca. There will be certain inconsistencies in the west part of Manteca with placing a new ROW outside of the UP corridor on lands designated for industrial, public/quasi public, residential, or other uses. There will be inconsistencies with land use designation in Manteca where acquiring property in residential, commercial, and industrial areas adjacent to the UP corridor through the middle of Manteca. San Joaquin County General Plan - inconsistent with land use policies for agricultural land crossed.	Manteca General Plan, Escalon General Plan, San Joaquin General Plan and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Manteca GP encourages passenger rail service that benefits Manteca. There will be inconsistencies with land use designation in western Manteca (where the route diverges from SR 120) where acquiring property in residential, commercial, and industrial areas. The use of SR 120 would be consistent with a transportation corridor. San Joaquin County General Plan - east of Manteca would be inconsistent with land use policies for agricultural land crossed, although project would mostly be located on plan line for SR 120 extension. In Escalon, there would be inconsistencies with land designated for industrial, commercial, or residential use.	Manteca General Plan, City of Ripon General Plan, San Joaquin General Plan and San Joaquin Regional Transportation Plan are supportive of extensions of interregional passenger rail service. Manteca GP encourages passenger rail service that benefits Manteca. There will be inconsistencies with land use designation in western Manteca (where the route diverges from SR 120) where acquiring property in residential, commercial, and industrial areas. There will also be land use inconsistencies where acquiring property west of SR 99 in Ripon in mixed use, school, urban core or other designated areas. San Joaquin County General Plan - inconsistent with land use policies for agricultural land crossed.

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TM-1a (WITHDRAWN)	TM-1b (CARRIED FORWARD)	TM-2a (CARRIED FORWARD)	TM-2b (CARRIED FORWARD)
Land Use cont'd	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	6 Acres	6 acres	8 Acres	8 Acres
	Disruption to State Highways	Identify State Highways impacted through ROW use or crossing	SR 99	SR 120, SR 99	SR 120, SR 99	SR 120, SR 99
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	UP	UP	None	None
	Disruption/relocation of existing utilities	Identify major utilities requiring relocation	High-voltage line.	High-voltage line.	None	None
	Residential and Business Displacement	Potential displacement of existing residences or businesses due to ultimate ROW requirements and grade separations	Residences: 49 Business: 27	Residences: 49 Businesses: 27	Residences: 21 Businesses: 1	Residences: 23 Businesses: 5
Disruption to Communities	Properties with access affected	Properties with access affected	None	None	1	1
	Local traffic effects around station	Increase in traffic congestion	Local traffic effects would likely be minor at the Lathrop/Manteca station.	Local traffic effects will likely be minor at the Lathrop/Manteca station.	New Manteca Station will increase local traffic near SR 120/South Main Street interchange.	New Manteca station will increase local traffic near SR120/South Main Street interchange.
	Local traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	None	New at-grade crossing of SR 120 at existing farm access roads.	New at-grade crossing of SR 120 at existing farm access roads.
Environmental Resources	Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Waterways (acres of wetlands and length of streams within 100 foot ROW)	Wetlands: 3 acres	Wetlands: 0.61 acres,	0	0
		Critical habitat (acres) Threatened and endangered (T&E) species habitat (acres)	0.83 acres of critical habitat that may support threatened or endangered species is present. 93 acres of habitat area with potential for presence of threatened and endangered species. Additional impact due to 7-mile redundant segment.	0.72 acres of critical habitat that may support threatened or endangered species is present. 54 acres of habitat area with potential for presence of threatened and endangered species.	0.72 acres of critical habitat that may support threatened or endangered species is present. 184 acres of habitat area with potential for presence of threatened and endangered species.	0.72 acres of critical habitat that may support threatened or endangered species is present. 80 acres of habitat area with potential for presence of threatened and endangered species.
	Cultural resources	Number of (previously recorded) historic structures within ultimate ROW	3 Additional impact due to 7-mile redundant segment.	1	1	0
		Archeological Sensitivity (identified as present or not previously recorded archaeological sites within ROW)	1 prehistoric and 1 multi-component site.	0	0	0
	Parklands	Acres of parklands within ultimate ROW	0 acres	0 acres	0 acres	0 acres
	Agricultural lands	Acres of farmland Acres of land in Williamson Act contract <sup>1</sup>	Prime: 28 acres Local Importance: 9 acres Statewide Importance: 39 acres Williamson Act: 6 acres Additional impact due to 7-mile redundant segment.	Prime: 17 acres Local Importance: 6 acres Statewide Importance: 47 acres Williamson Act: 6 acres	Prime: 24 acres Local Importance: 4 acres Statewide Importance: 124 acres Williamson Act: 75 acres	Prime: 18 acres Local Importance: 2 acres Statewide Importance: 44 acres Williamson Act: 13 acres

Evaluation Criteria			Alternatives (Yellow = Primary Rationale for Alternative to be Withdrawn; See Detailed Discussion in Section 4.0)			
Category	Criteria	Measurement	TM-1a (WITHDRAWN)	TM-1b (CARRIED FORWARD)	TM-2a (CARRIED FORWARD)	TM-2b (CARRIED FORWARD)
Environmental Quality	Noise and vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), School (S) and park (P) properties within 300' of ultimate ROW	Residential: 389 Institutional: 3 School: 1 Parks: 4	Residential: 362 Institutional: 2 Parks: 3	Residential: 147 Parks: 2	Residential: 146 Institutional: 1 School: 1 Parks: 2
	Noise and vibration effects on sensitive receivers cont'd	Number of residential (R), institutional (I) and park (P) properties immediately adjacent to the ultimate ROW	This alternative would introduce new structures and affect views of residential neighborhoods from Gianna Lane, Phillips Drive, Kelley Drive, Pearl Place, Pioneer Avenue, and Moffat Boulevard, institution, and from Primavera Park, Walnut Place, Tidwater Bikeway, Mini Park, Lib Park, and Mayor's Park.	This alternative would introduce new aerial and at-grade structures resulting in visual impacts on residences along McKinley Avenue, West Yosemite Avenue, from Phillips Drive, Kelley Drive, Meadowbrook Court, Pearl Place, Pioneer Avenue, Moffet Boulevard, an institution, and Gianna Lane Park, Primavera Park, Walnut Place, Tidwater Bikeway, Mini Park, Lib Park, and Mayor's Park.	This alternative would introduce new aerial and at-grade structures resulting in visual impacts on residences along Atherton Drive, Laurel Park Circle, Nohr Circle, Hunt Road, Winterbrook Street, Sexton Road, South Wagner Avenue, North Ripon Road, Jack Tone Road, and Dutra Northeast and Quail Ridge Parks.	This alternative would introduce new aerial and at-grade structures resulting in visual impacts on residences along Atherton Drive, Laurel Park Circle, Nohr Circle, Hunt Road, Mission Ridge Drive, Pine Street, Frontage Road, and McKee Court, Dutra Northeast Park, Quail Ridge Park, Cotta Park and an institution.
	Change in visual/scenic resources	Number of scenic roadways that cross the ROW	0	0	0	0
	Maximize avoidance of areas with geological and soils constraints	Number of fault crossings (FC) Alquist-Priolo fault zones (APZ) Area (acres) of high landslide susceptibility	0	0	0	0
	Maximize avoidance of areas with potential hazardous materials	Number of potential hazardous material sites within 100 foot ROW and within 1/4 mile as two different counts (1/4 mile does not include 100 foot ROW)	100-ft. ROW: 6 1/4-mile: 422 Additional impact due to 7-mile redundant segment.	100-ft. ROW: 6 1/4-mile: 329	100-ft. ROW: 3 1/4-mile: 148	100-ft. ROW: 5 1/4-mile 180

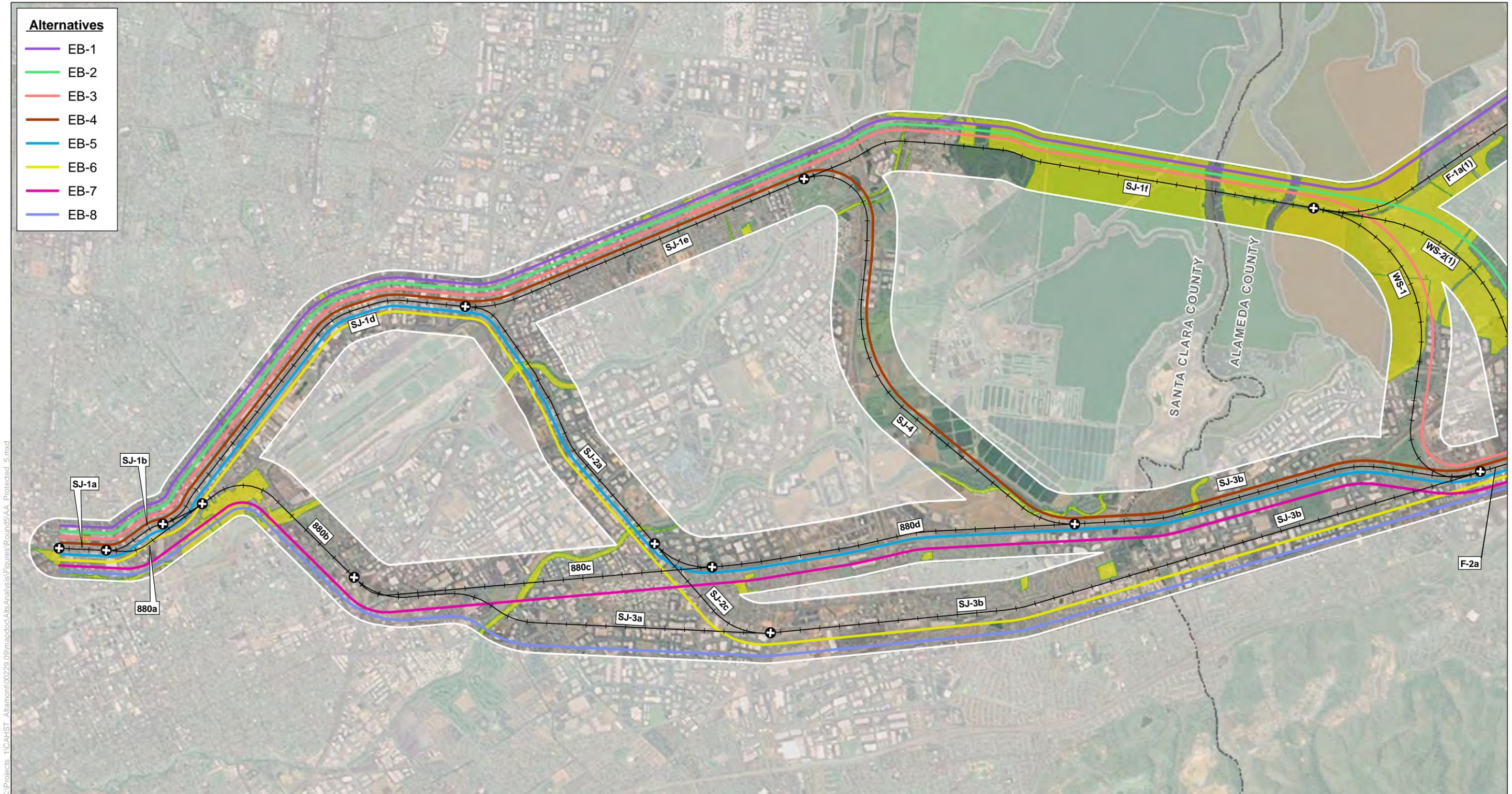
Notes:

<sup>1</sup> Williamson Act lands are lands under which local governments enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

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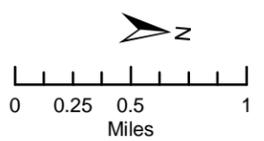
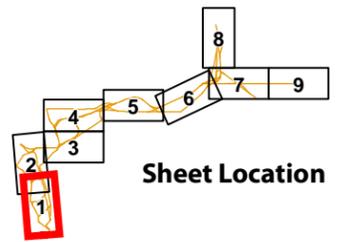
**Appendix F**  
**ENVIRONMENTAL MAPS**





- Alternatives**
- EB-1
  - EB-2
  - EB-3
  - EB-4
  - EB-5
  - EB-6
  - EB-7
  - EB-8

K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Round5\AAA\_Protected\_5.mxd



Source: California Dept. of Conservation

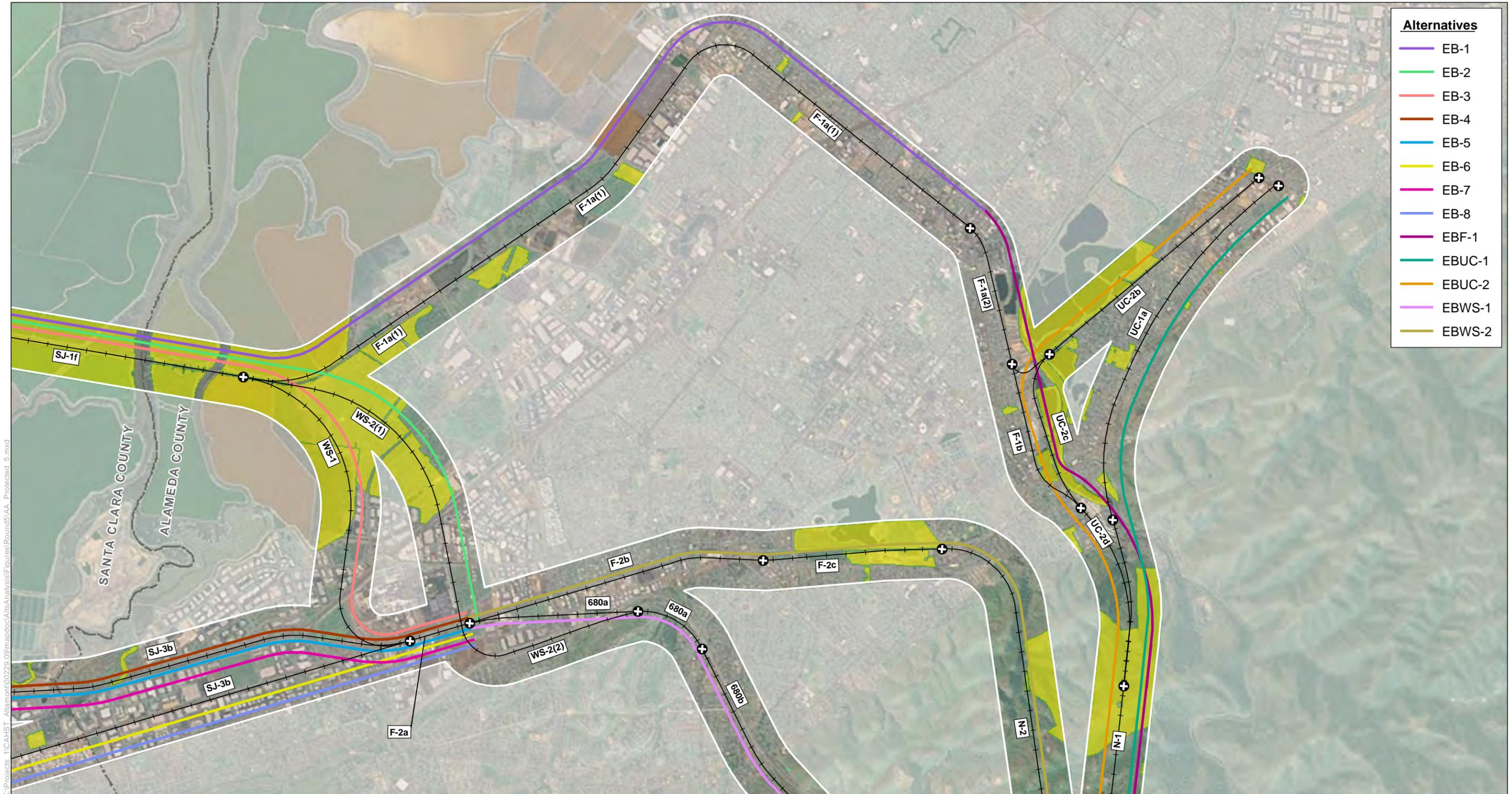
- Alignment Centerlines
- Parks and Other Protected Lands
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

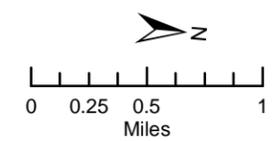
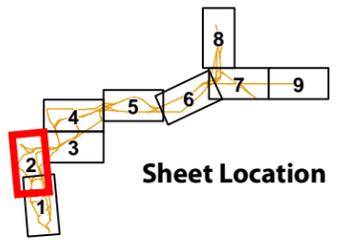
**Protected Lands**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EB-1
  - EB-2
  - EB-3
  - EB-4
  - EB-5
  - EB-6
  - EB-7
  - EB-8
  - EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2

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Source: California Dept. of Conservation

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

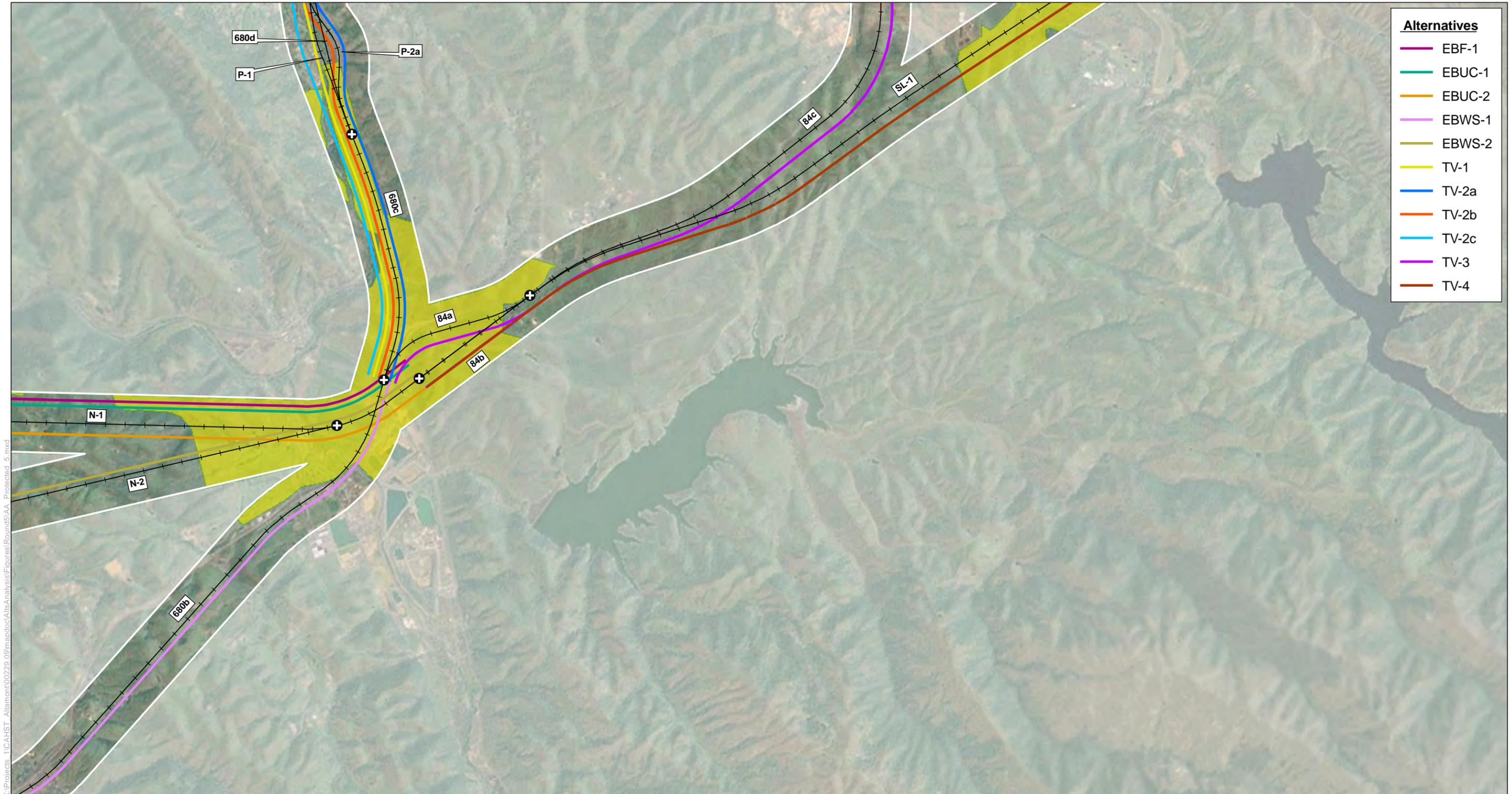
Parks and Other Protected Lands

**Altamont Corridor Rail Project**

**Alternatives Analysis**

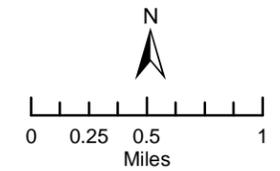
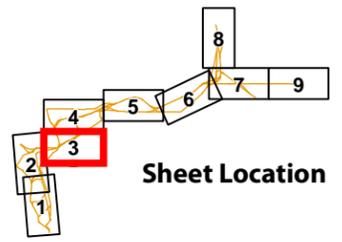
**Protected Lands**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2
  - TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

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Source: California Dept. of Conservation

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

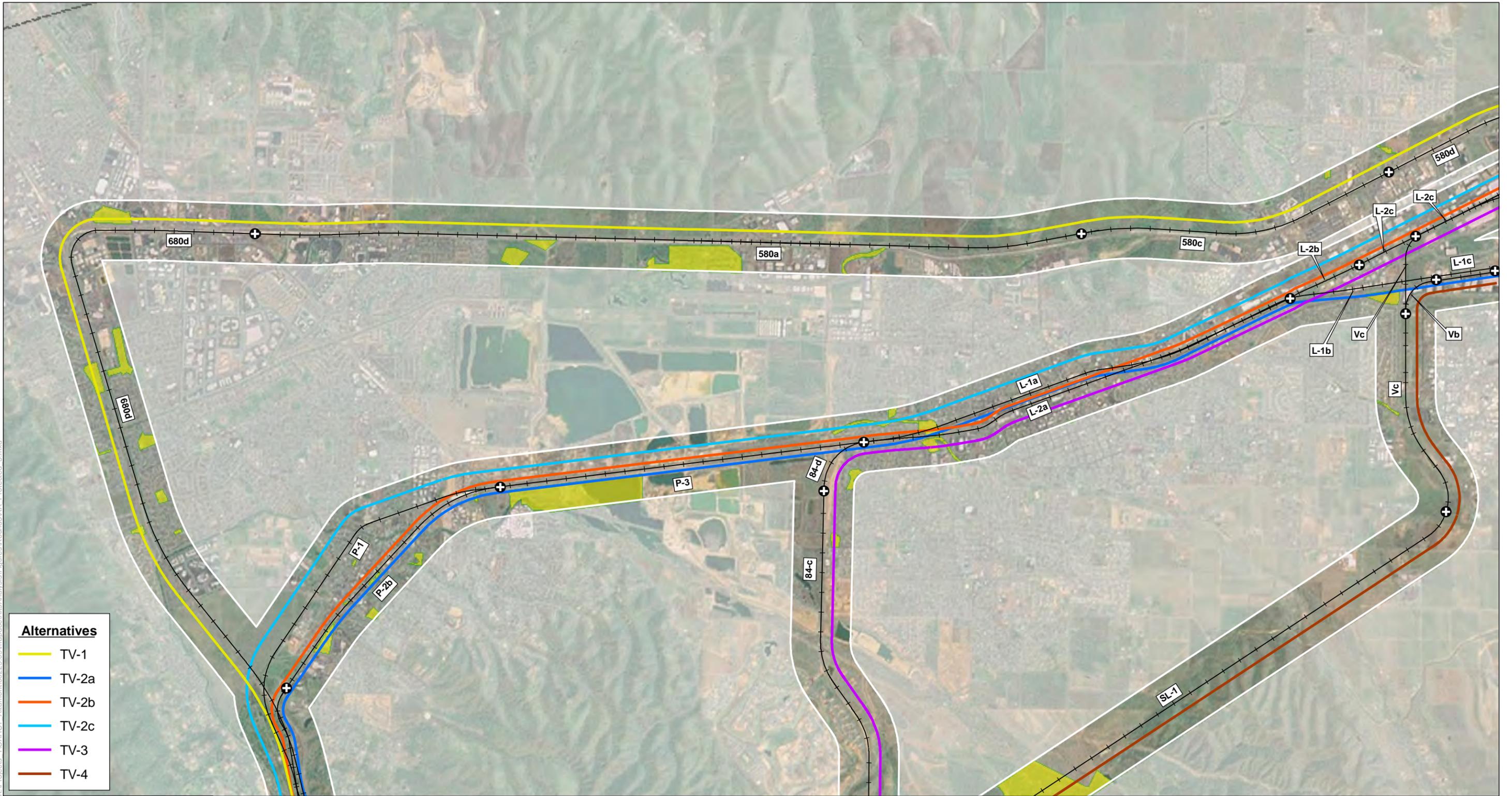
**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Protected Lands**

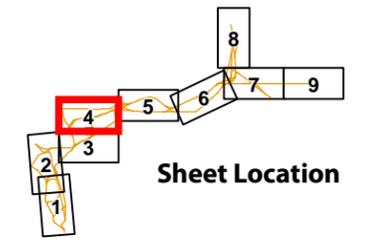
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

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**Alternatives**

- TV-1
- TV-2a
- TV-2b
- TV-2c
- TV-3
- TV-4



Source: California Dept. of Conservation

Alignment Centerlines
 Quarter mile buffer area
 Segment Endpoints
 Segment Names

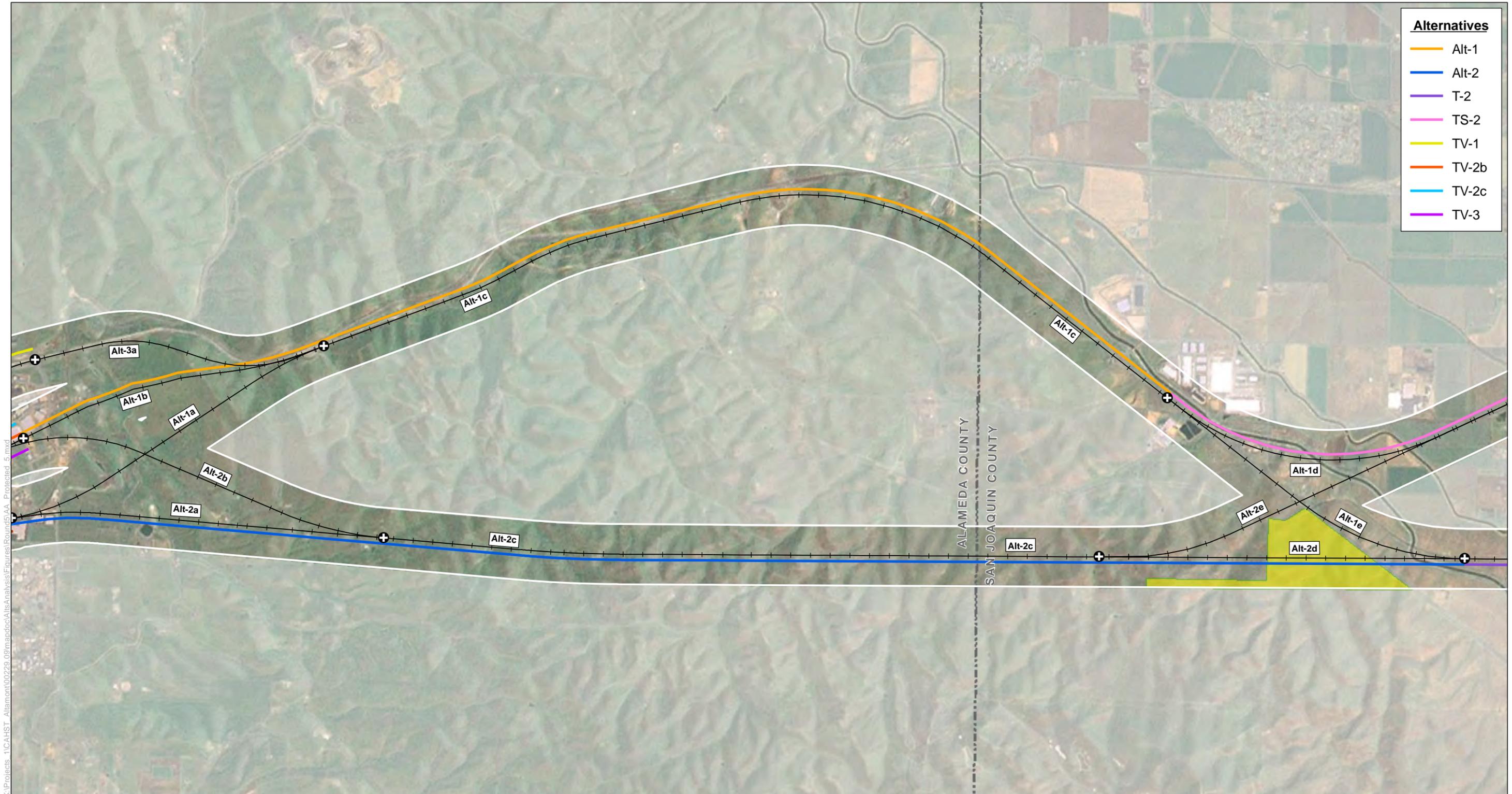
Parks and Other Protected Lands

**Altamont Corridor Rail Project**

**Alternatives Analysis**

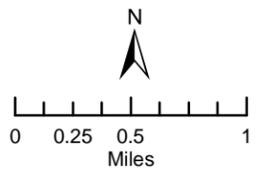
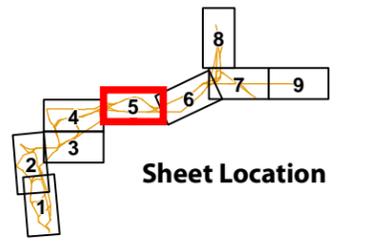
**Protected Lands**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



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- Alternatives**
- Alt-1
  - Alt-2
  - T-2
  - TS-2
  - TV-1
  - TV-2b
  - TV-2c
  - TV-3



Source: California Dept. of Conservation

—+— Alignment Centerlines

Parks and Other Protected Lands

Quarter mile buffer area

+ Segment Endpoints

SJ-3a Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Protected Lands**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

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Alternatives	
	T-1
	T-2
	TM-1a
	TM-1b
	TM-2a
	TM-2b
	TS-1
	TS-2
	TS-3
	TS-4

Parks and Other Protected Lands

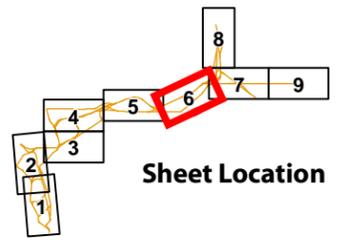
Alignment Centerlines Quarter mile buffer area Segment Endpoints Segment Names

### Altamont Corridor Rail Project

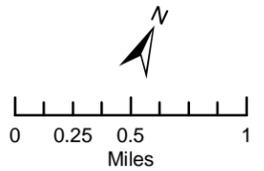
#### Alternatives Analysis

#### Protected Lands

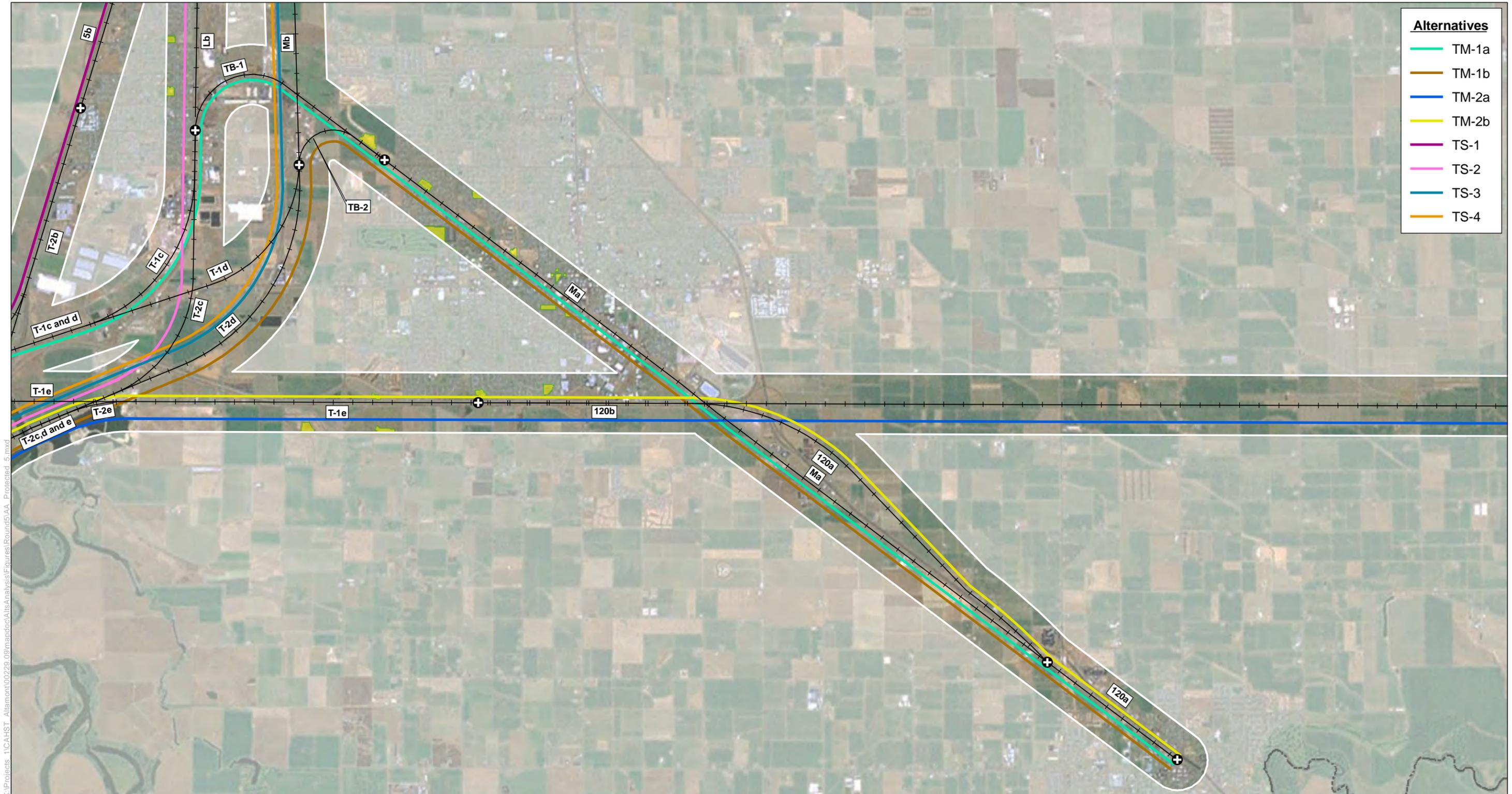
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



Sheet Location

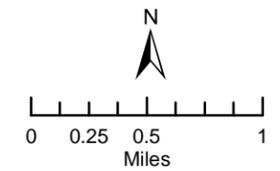
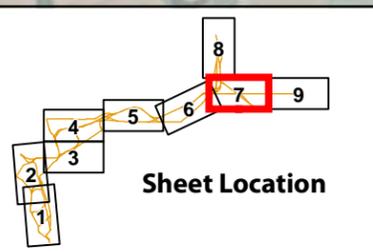


Source: California Dept. of Conservation



- Alternatives**
- TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

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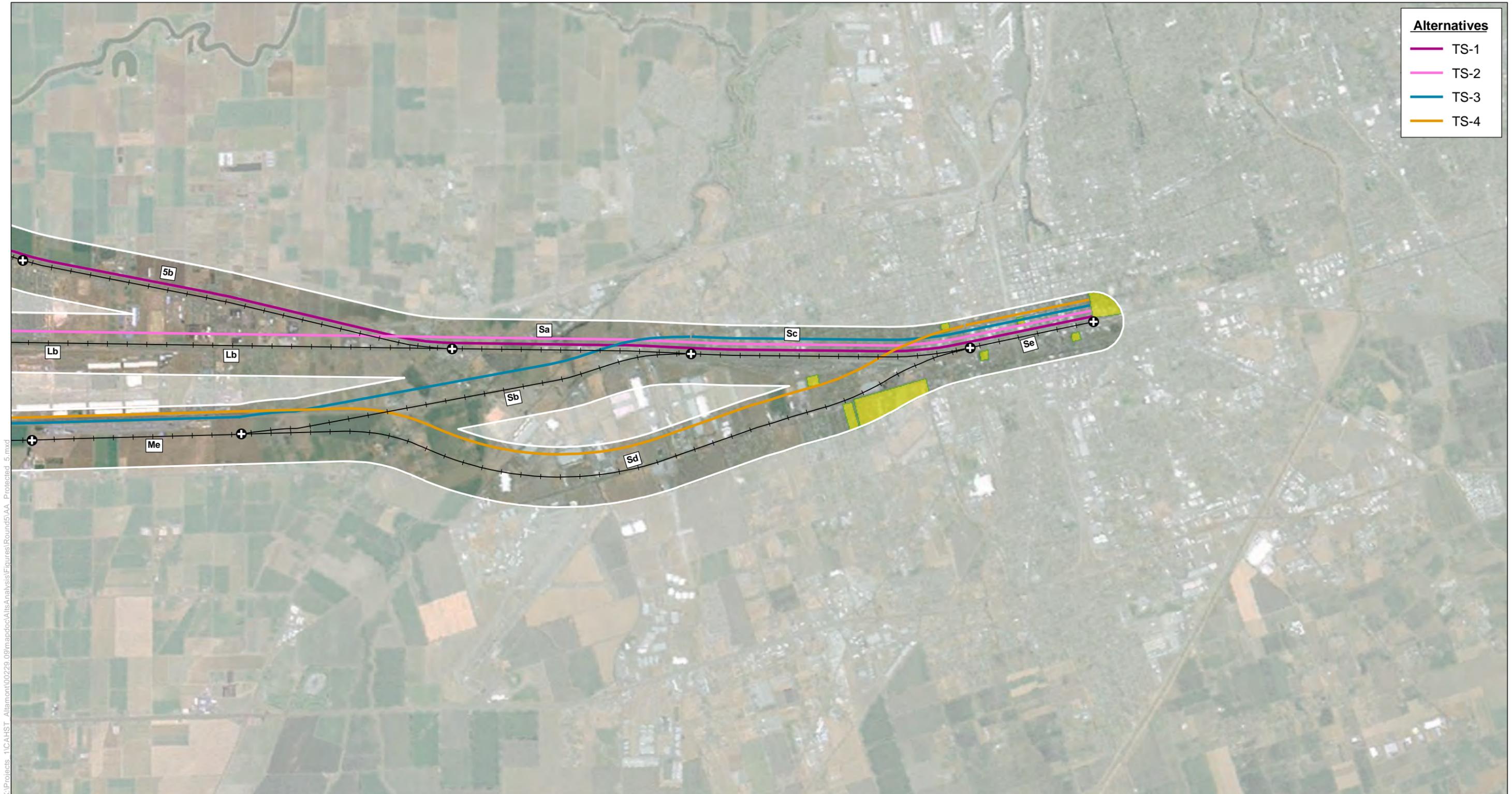
- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Protected Lands**

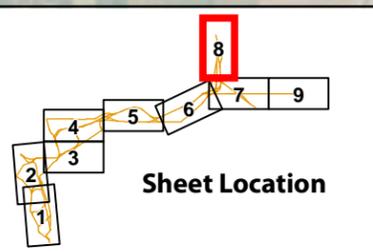
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



**Alternatives**

- TS-1
- TS-2
- TS-3
- TS-4

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Source: California Dept. of Conservation

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

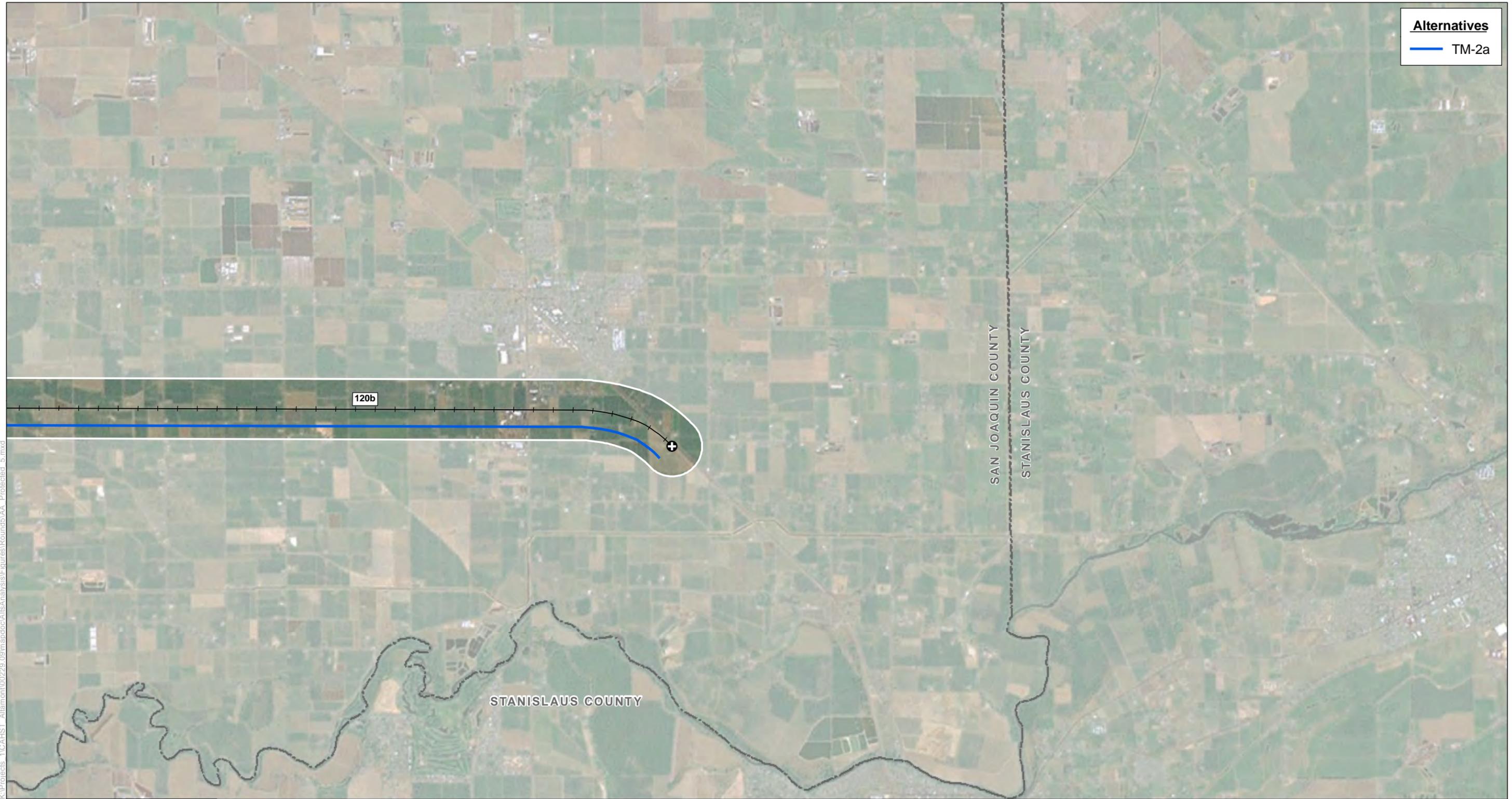
**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Protected Lands**

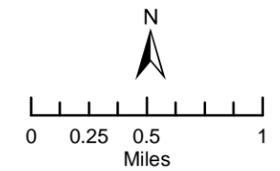
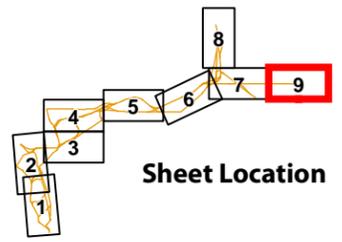
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

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**Alternatives**

— TM-2a



Source: California Dept. of Conservation

—+— Alignment Centerlines

Parks and Other Protected Lands

Quarter mile buffer area

Segment Endpoints

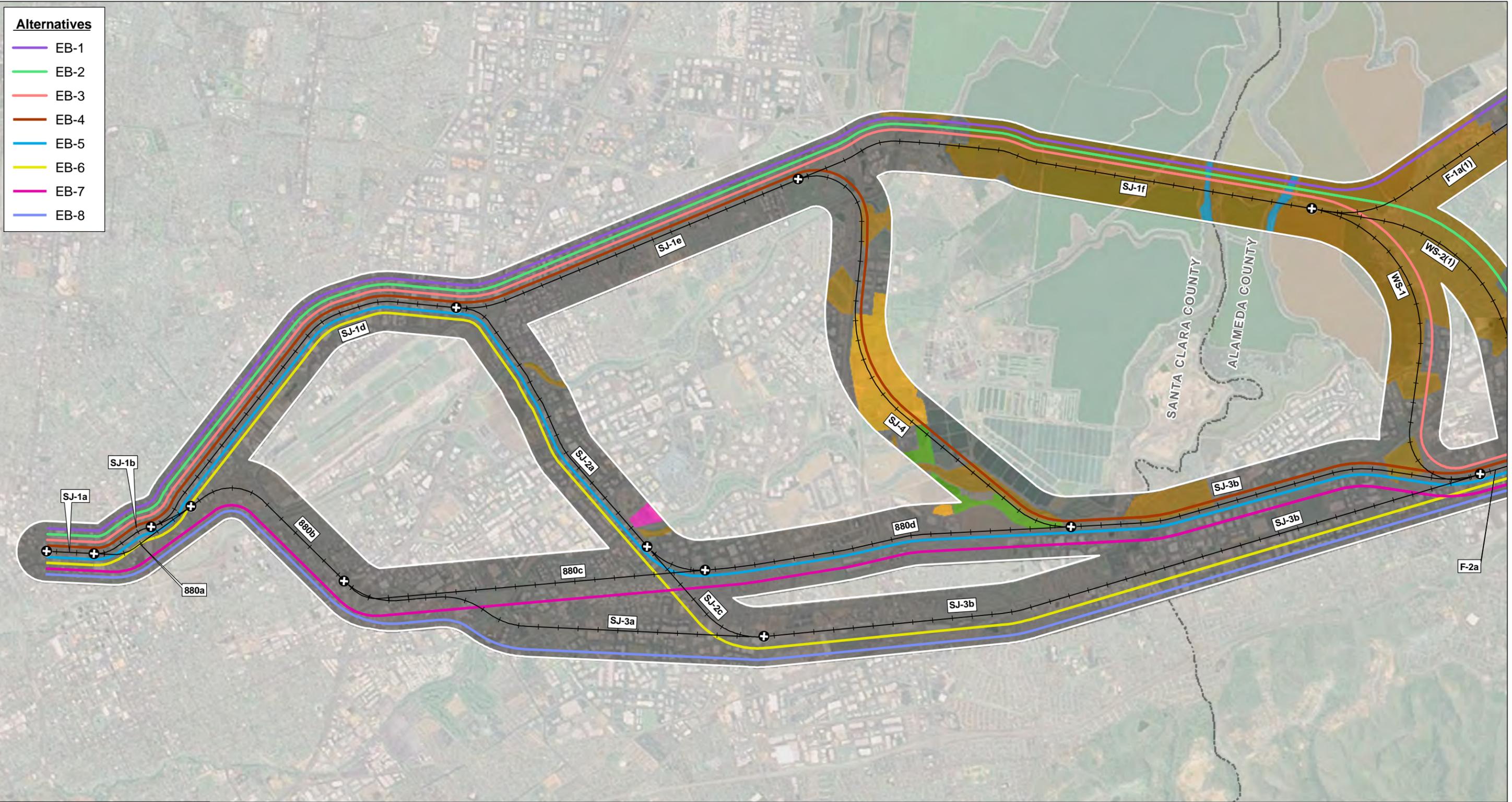
Segment Names

**Altamont Corridor Rail Project**

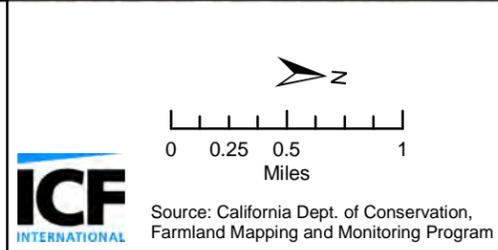
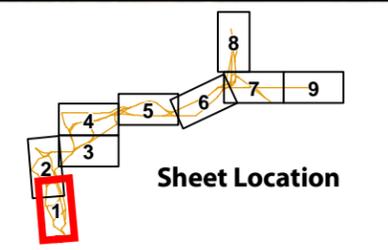
**Alternatives Analysis**

**Protected Lands**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



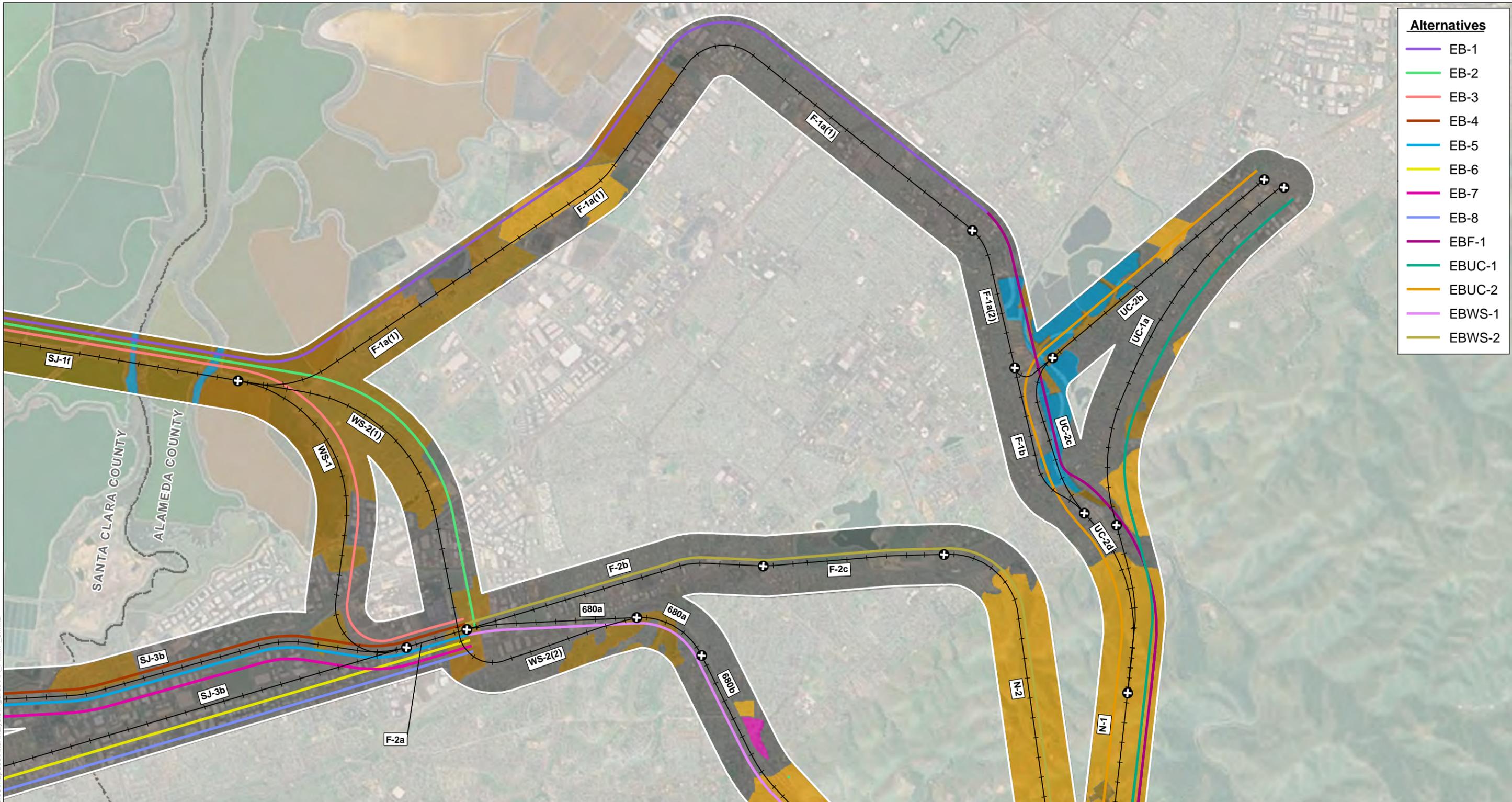
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**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Farmland Mapping and Monitoring Program**

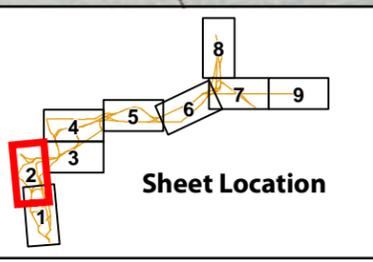
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

Sheet 1 of 9



- Alternatives**
- EB-1
  - EB-2
  - EB-3
  - EB-4
  - EB-5
  - EB-6
  - EB-7
  - EB-8
  - EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2

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**ICF INTERNATIONAL**

Source: California Dept. of Conservation, Farmland Mapping and Monitoring Program

**FMMP Land Classifications**

Urban and Built-up Land	Prime Farmland	Unique Farmland	Other
Grazing	Farmland of Statewide Importance	Water	

Alignment Centerlines  
 Quarter mile buffer Area  
 Segment Endpoints  
 **SJ-3a - Segment Names**

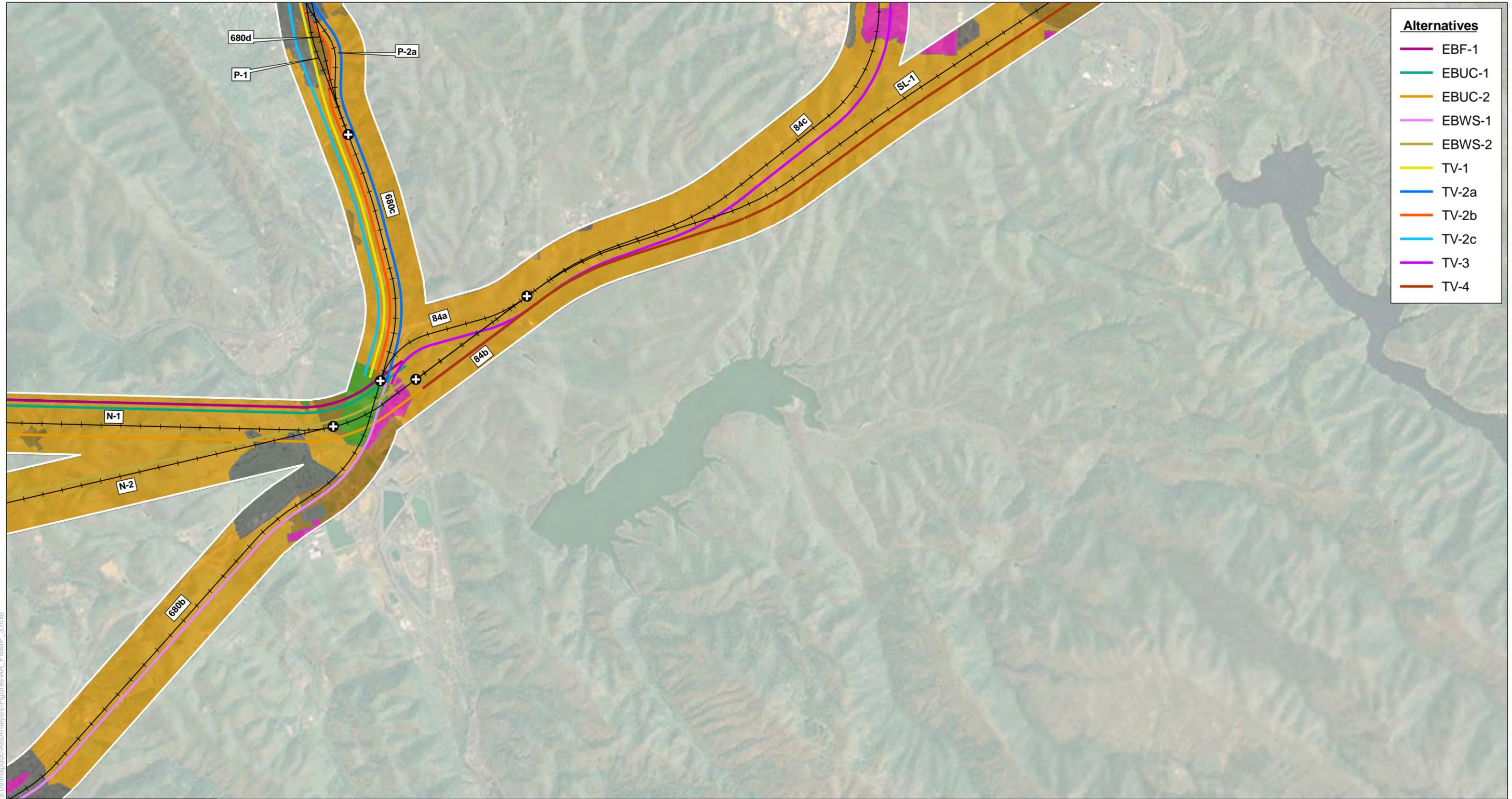
**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Farmland Mapping and Monitoring Program**

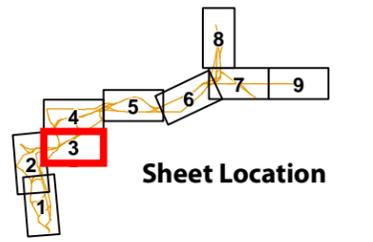
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

Sheet 2 of 9



- Alternatives**
- EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2
  - TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

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N

0 0.25 0.5 1  
Miles

Source: California Dept. of Conservation,  
Farmland Mapping and Monitoring Program

**FMMP Land Classifications**

Urban and Built-up Land	Prime Farmland	Unique Farmland	Other
Grazing	Farmland of Statewide Importance	Water	

Alignment Centerlines  
 Quarter mile buffer Area  
 Segment Endpoints  
 **SJ-3a** - Segment Names

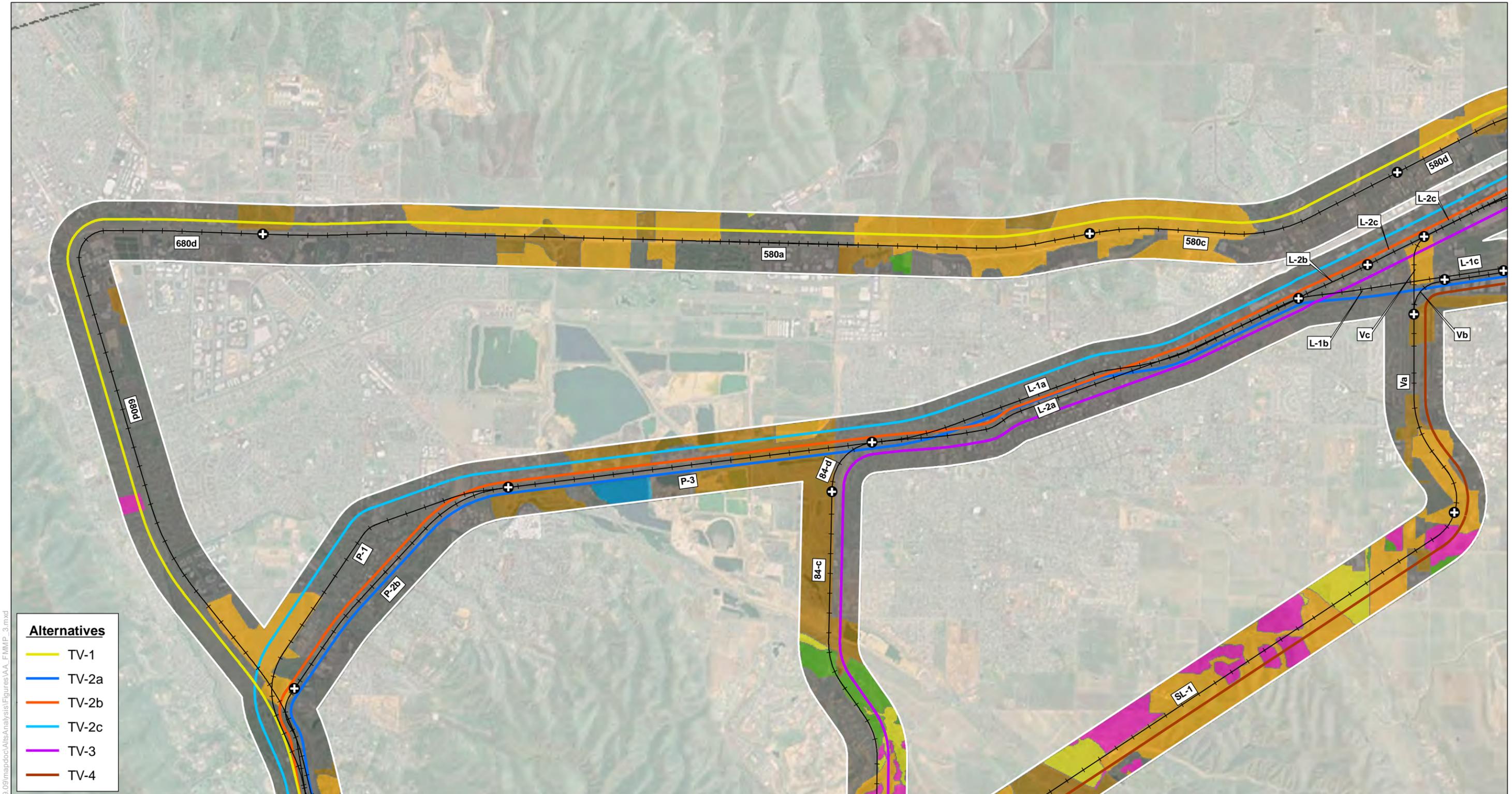
**Altamont Corridor Rail Project**

**Alternatives Analysis**

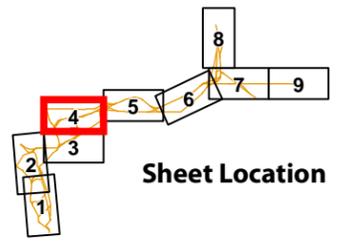
**Farmland Mapping and Monitoring Program**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

Sheet 3 of 9



- Alternatives**
- TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

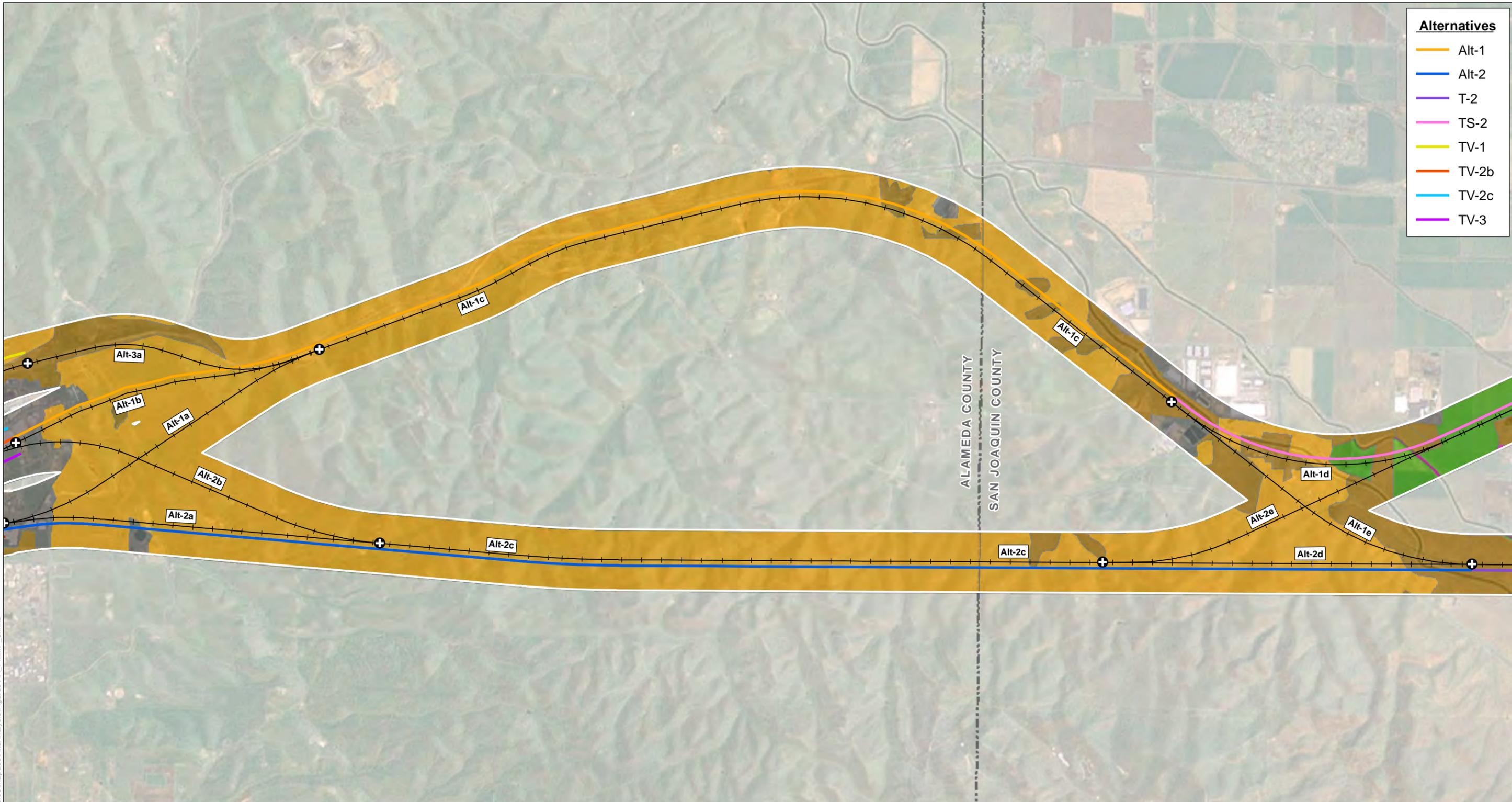


Source: California Dept. of Conservation, Farmland Mapping and Monitoring Program

- FMMP Land Classifications**
- Urban and Built-up Land
  - Prime Farmland
  - Unique Farmland
  - Grazing
  - Farmland of Statewide Importance
  - Water
  - Other
- +— Alignment Centerlines  
 [ ] Quarter mile buffer Area  
 + Segment Endpoints  
 SJ-3a - Segment Names

**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Farmland Mapping and Monitoring Program**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



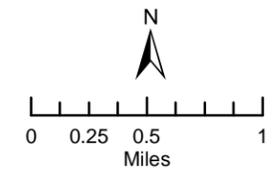
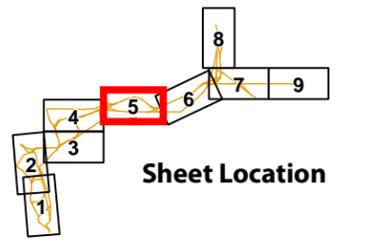
- Alternatives**
- Alt-1
  - Alt-2
  - T-2
  - TS-2
  - TV-1
  - TV-2b
  - TV-2c
  - TV-3

- FMMP Land Classifications**
- Urban and Built-up Land
  - Prime Farmland
  - Unique Farmland
  - Grazing
  - Farmland of Statewide Importance
  - Water
  - Other
- +— Alignment Centerlines  
 □ Quarter mile buffer Area  
 ⊕ Segment Endpoints  
 SJ-3a - Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Farmland Mapping and Monitoring Program**



Source: California Dept. of Conservation, Farmland Mapping and Monitoring Program

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



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**Alternatives**

- T-1
- T-2
- TM-1a
- TM-1b
- TM-2a
- TM-2b
- TS-1
- TS-2
- TS-3
- TS-4

**FMMP Land Classifications**

- |  |   |   |   |
|--|---|---|---|
| <span style="background-color: gray; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Urban and Built-up Land | <span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Prime Farmland                    | <span style="background-color: magenta; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Unique Farmland | <span style="background-color: brown; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Other |
| <span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Grazing               | <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Farmland of Statewide Importance | <span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Water         |   |

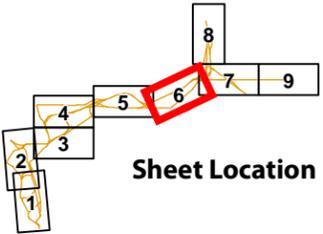
- Alignment Centerlines  
  Quarter mile buffer Area  
 + Segment Endpoints  
 **SJ-3a** - Segment Names

**Altamont Corridor Rail Project**

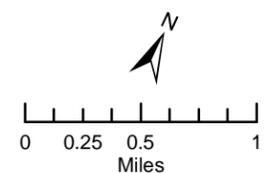
**Alternatives Analysis**

**Farmland Mapping and Monitoring Program**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



Source: California Dept. of Conservation,  
 Farmland Mapping and Monitoring Program



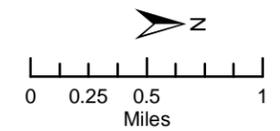
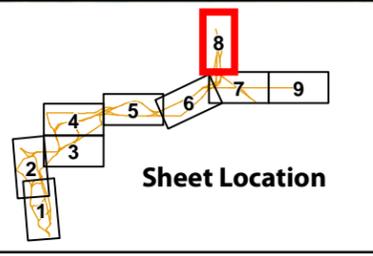




**Alternatives**

- TS-1
- TS-2
- TS-3
- TS-4

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Source: California Dept. of Conservation, Farmland Mapping and Monitoring Program

**FMMP Land Classifications**

- Urban and Built-up Land
- Prime Farmland
- Unique Farmland
- Other
- Grazing
- Farmland of Statewide Importance
- Water

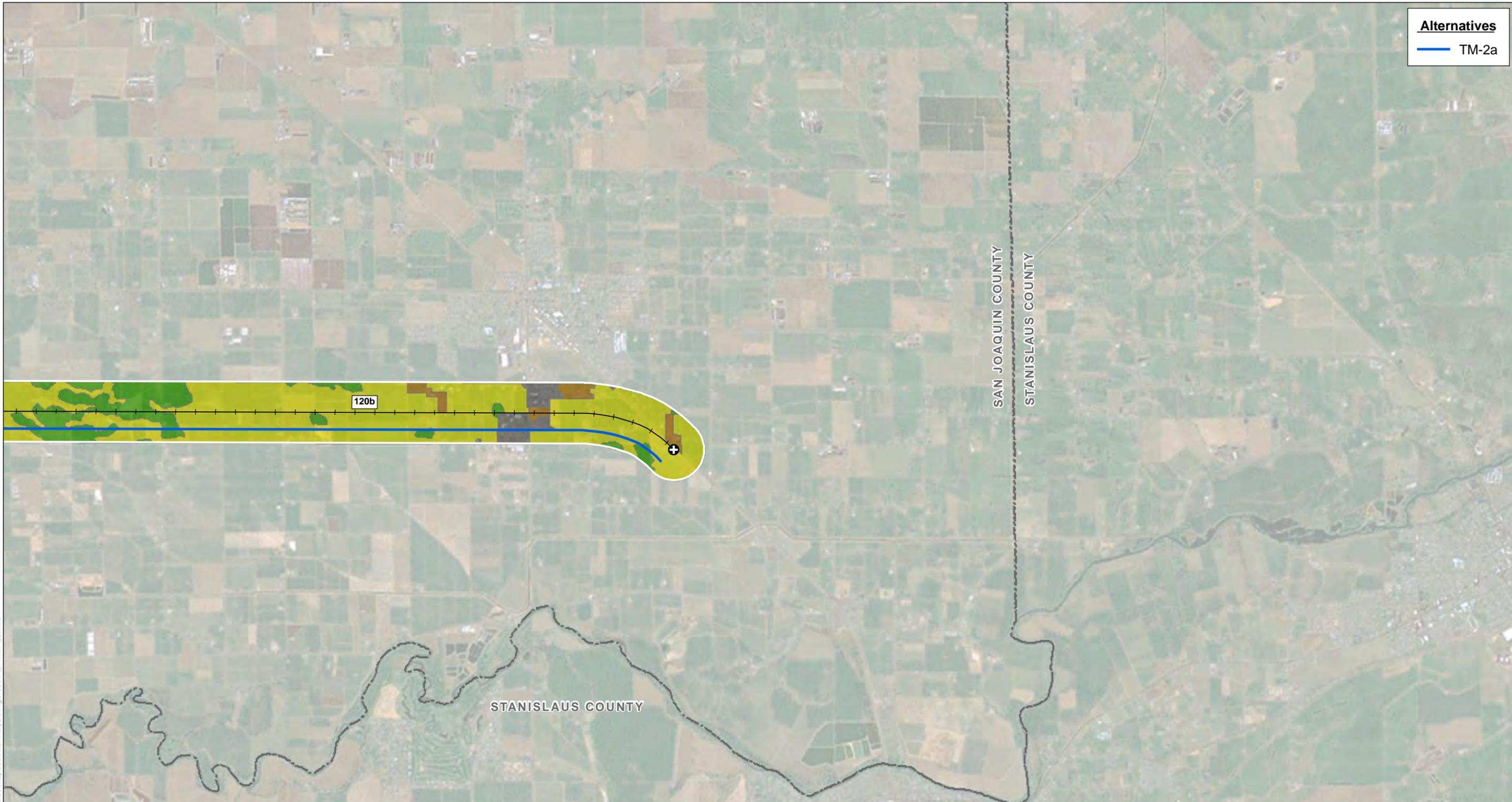
- +— Alignment Centerlines
- Quarter mile buffer Area
- ⊕ Segment Endpoints
- SJ-3a - Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

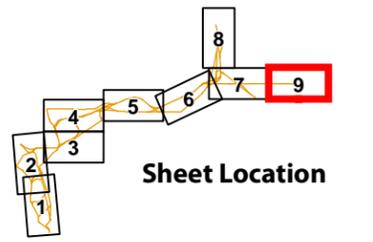
**Farmland Mapping and Monitoring Program**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



**Alternatives**  
 — TM-2a

K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\AA\_FMMP\_3.mxd



Source: California Dept. of Conservation,  
 Farmland Mapping and Monitoring Program

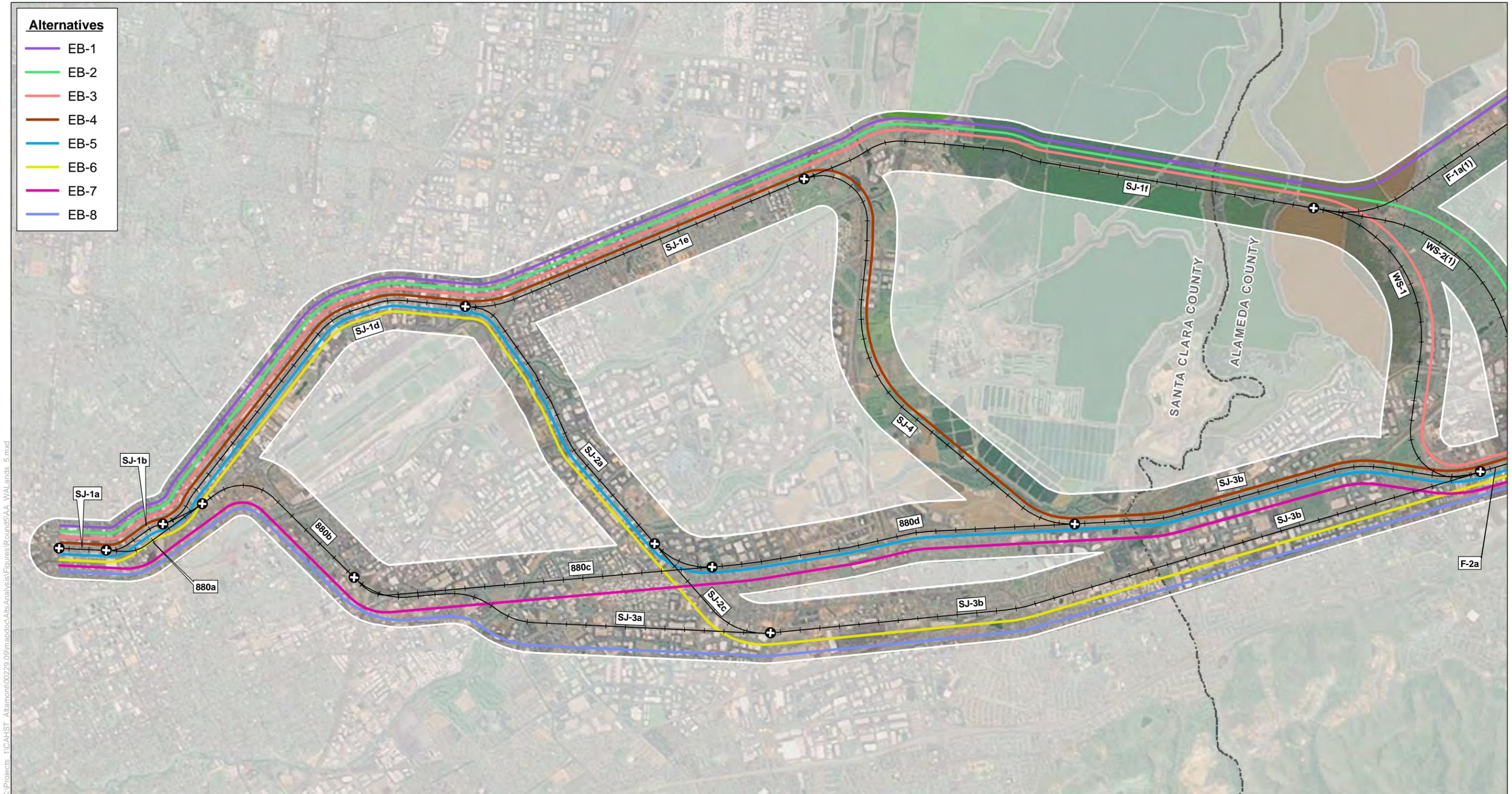
**FMMP Land Classifications**

Urban and Built-up Land	Prime Farmland	Unique Farmland	Other
Grazing	Farmland of Statewide Importance	Water	

Alignment Centerlines  
 Quarter mile buffer Area  
 Segment Endpoints  
 **SJ-3a - Segment Names**

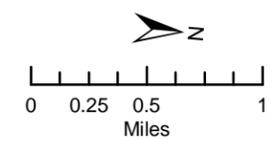
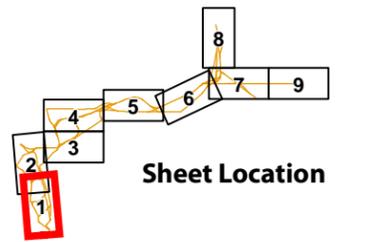
**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Farmland Mapping and Monitoring Program**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EB-1
  - EB-2
  - EB-3
  - EB-4
  - EB-5
  - EB-6
  - EB-7
  - EB-8

K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\Round5AA\_WALands\_5.mxd



Source: California Dept. of Conservation

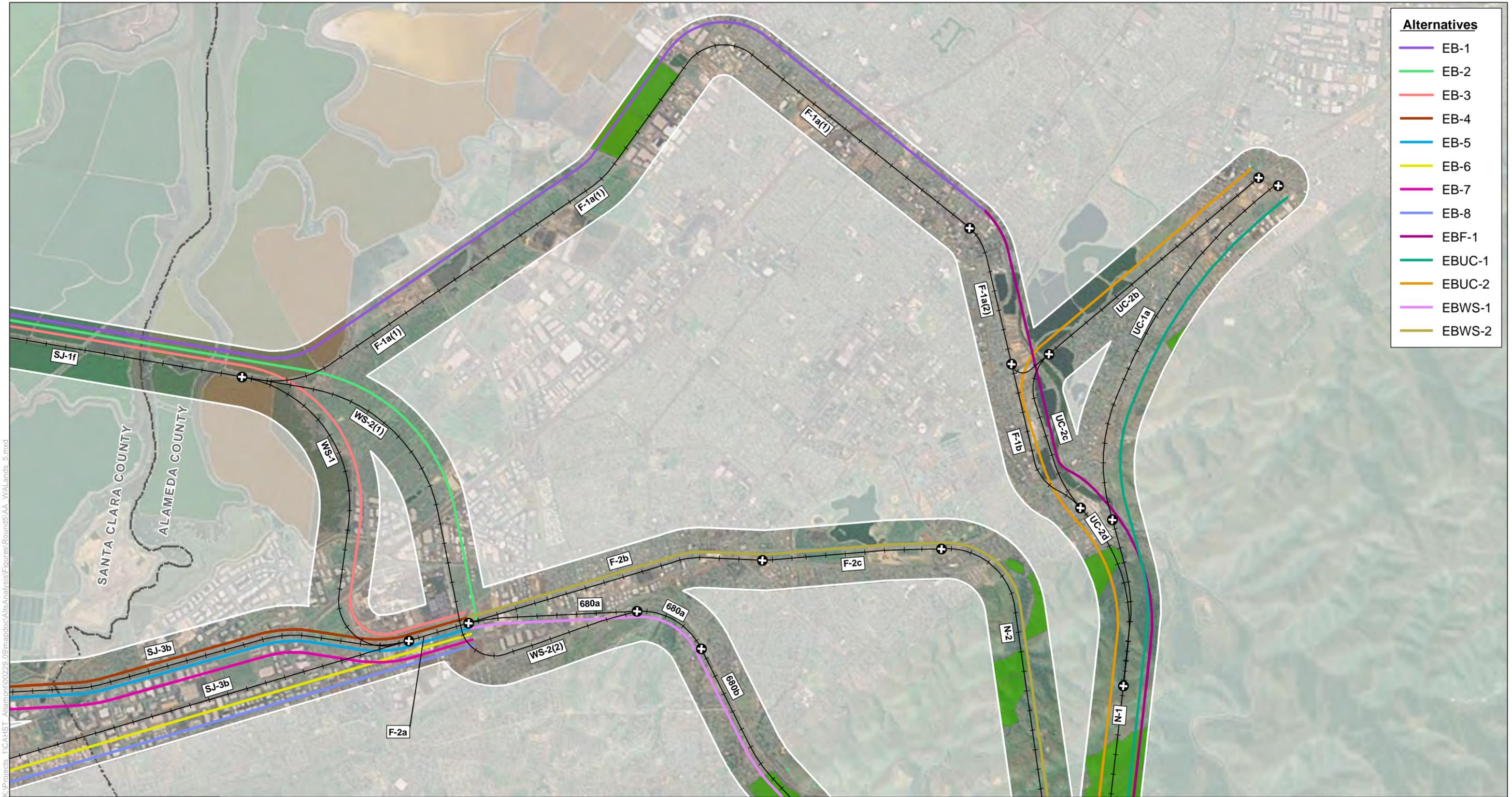
- Williamson Act Lands, 2009
- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

**Altamont Corridor Rail Project**

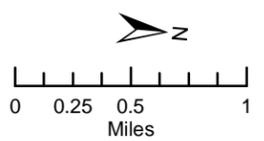
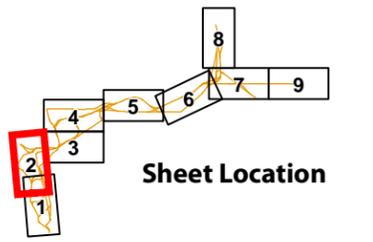
**Alternatives Analysis**

**Williamson Act Lands**



Alternatives	
EB-1	[Purple line]
EB-2	[Green line]
EB-3	[Red line]
EB-4	[Brown line]
EB-5	[Blue line]
EB-6	[Yellow line]
EB-7	[Pink line]
EB-8	[Light blue line]
EBF-1	[Magenta line]
EBUC-1	[Teal line]
EBUC-2	[Orange line]
EBWS-1	[Light purple line]
EBWS-2	[Olive line]

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



Source: California Dept. of Conservation

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

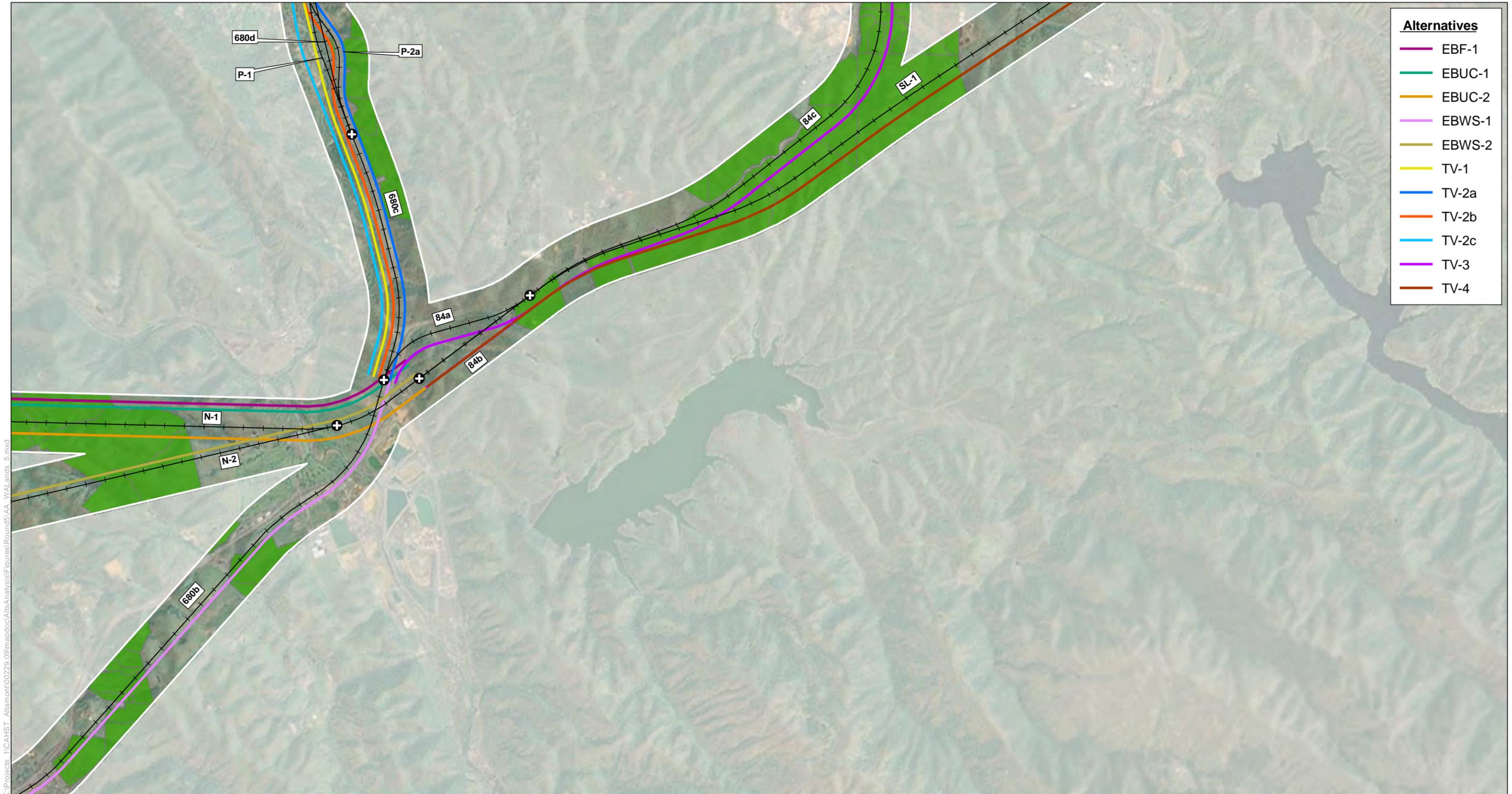
Williamson Act Lands, 2009

### Altamont Corridor Rail Project

#### Alternatives Analysis

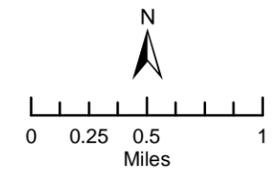
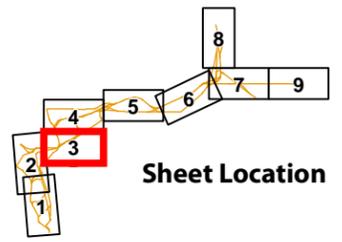
#### Williamson Act Lands

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2
  - TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



Source: California Dept. of Conservation

- Alignment Centerlines
- Williamson Act Lands, 2009
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

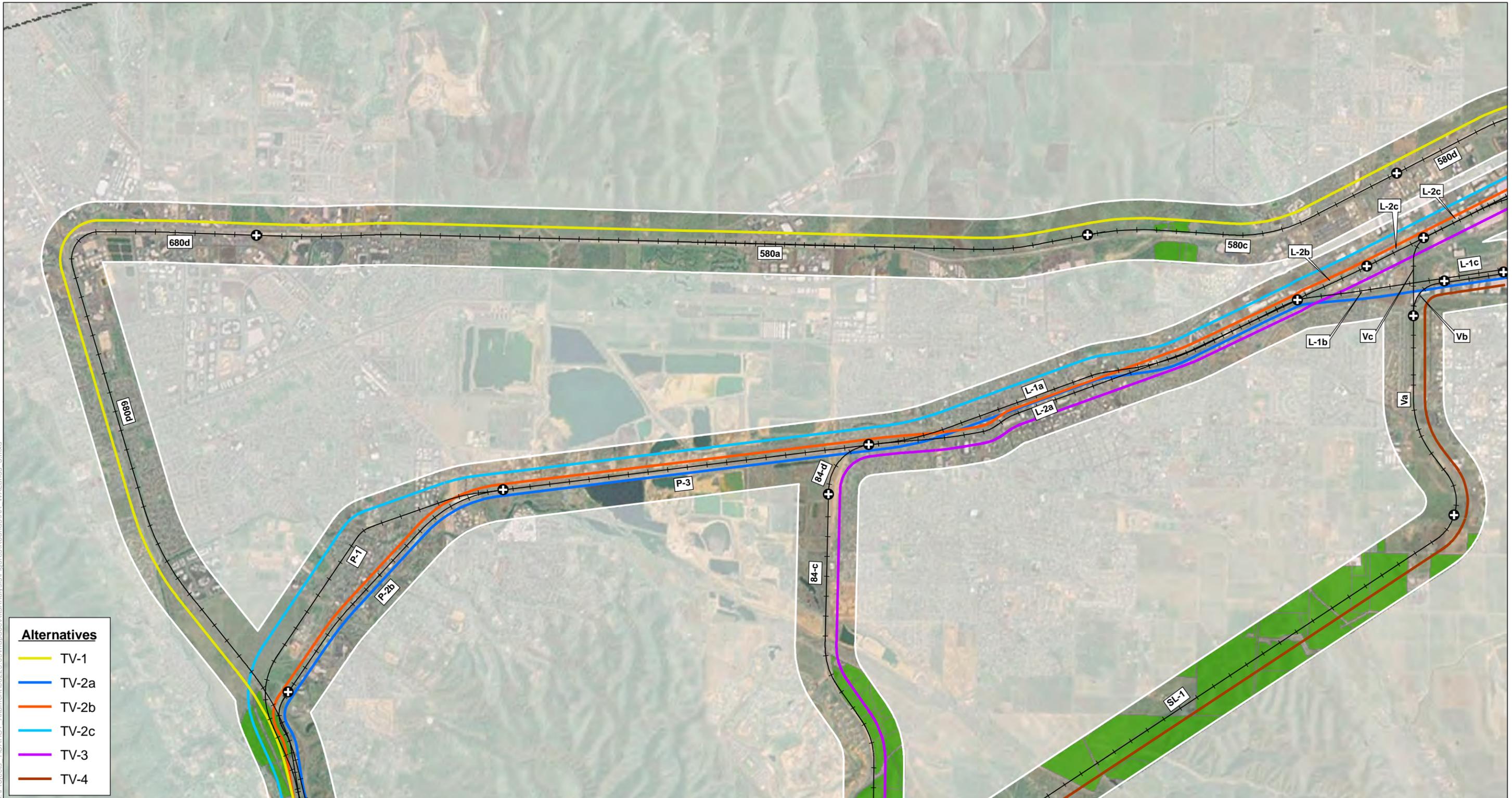
**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Williamson Act Lands**

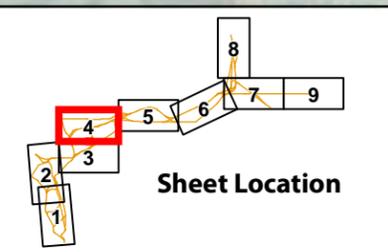
**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



**Alternatives**

- TV-1
- TV-2a
- TV-2b
- TV-2c
- TV-3
- TV-4



0 0.25 0.5 1  
Miles  
Source: California Dept. of Conservation

- +— Alignment Centerlines
- Quarter mile buffer area
- + Segment Endpoints
- SL-1a Segment Names

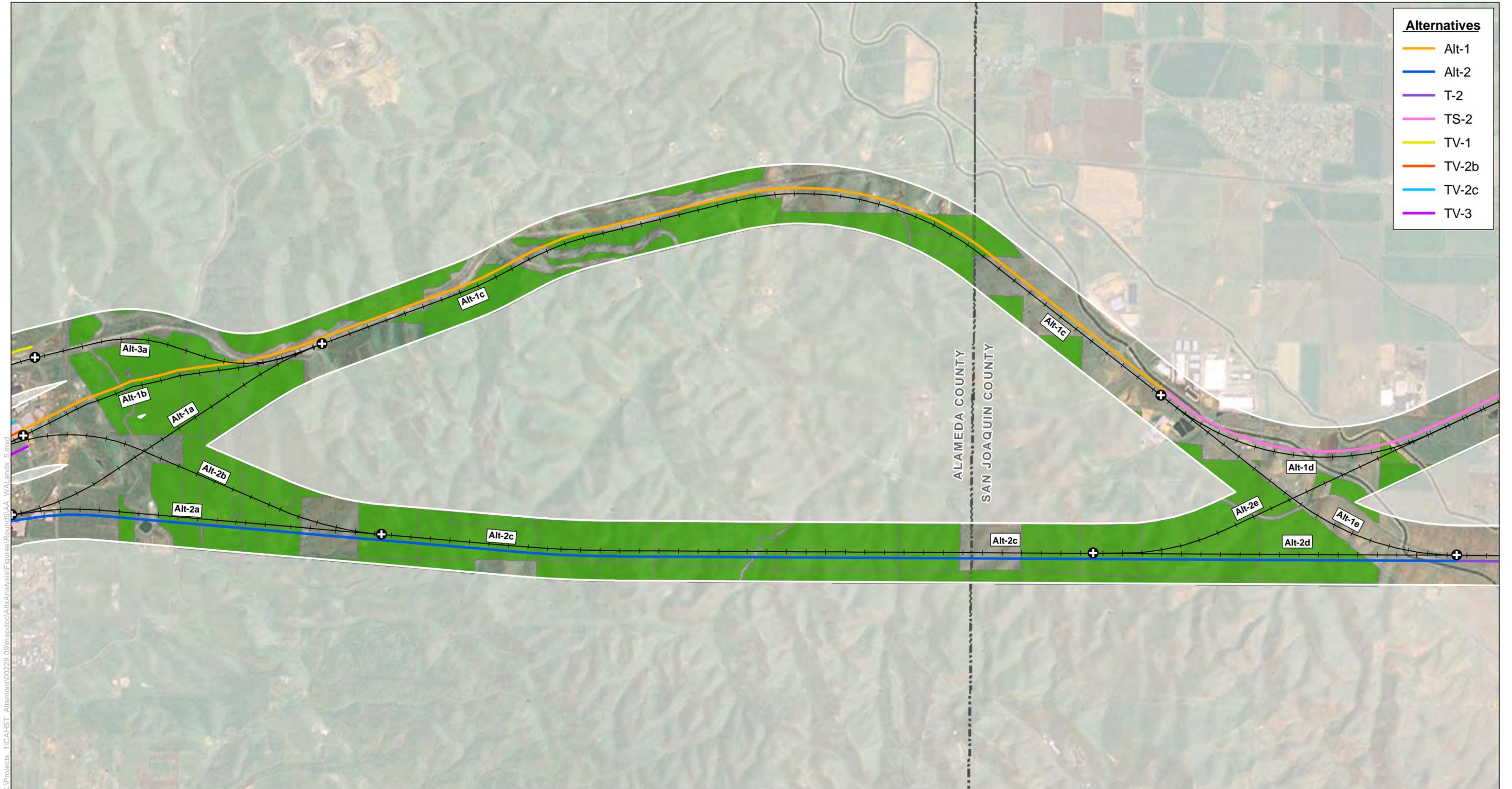
■ Williamson Act Lands, 2009

**Altamont Corridor Rail Project**

**Alternatives Analysis**

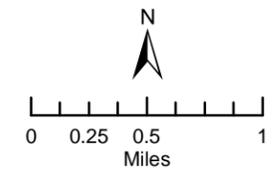
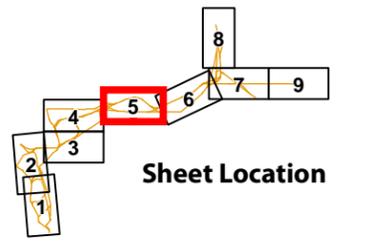
**Williamson Act Lands**

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- Alt-1
  - Alt-2
  - T-2
  - TS-2
  - TV-1
  - TV-2b
  - TV-2c
  - TV-3

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AltsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



Source: California Dept. of Conservation

Williamson Act Lands, 2009

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

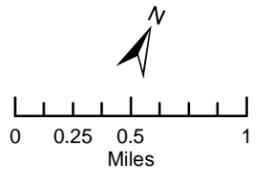
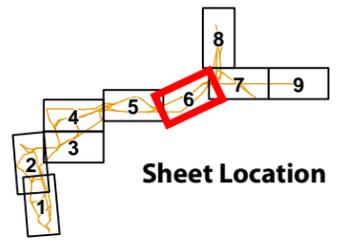
**Williamson Act Lands**

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



K:\Projects\1\CAHST\Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_WALands\_5.mxd

- Alternatives**
- T-1
  - T-2
  - TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4



Source: California Dept. of Conservation

■ Williamson Act Lands, 2009

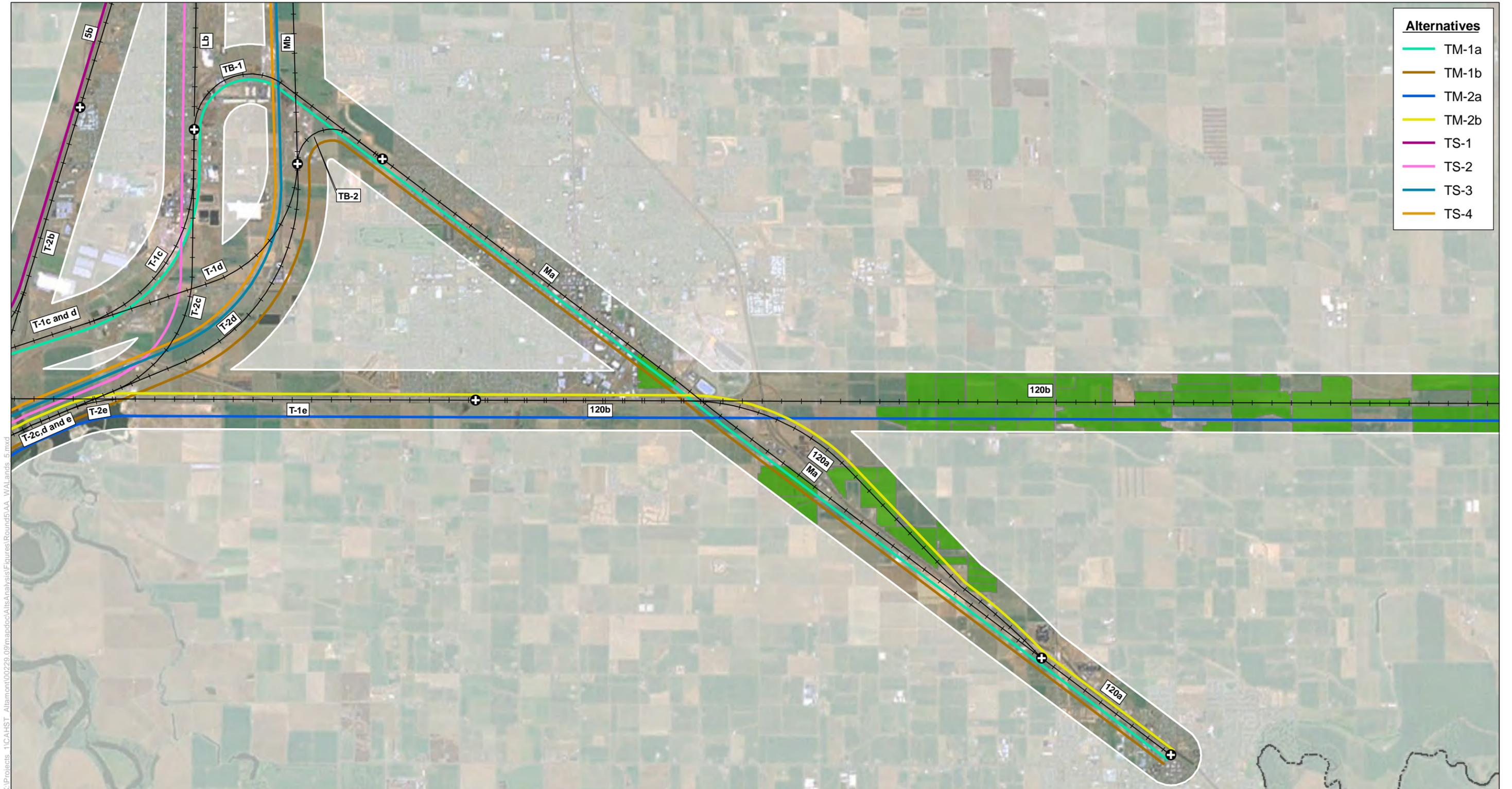
- +— Alignment Centerlines
- Quarter mile buffer area
- ⊕ Segment Endpoints
- SJ-3a Segment Names

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

**Altamont Corridor Rail Project**

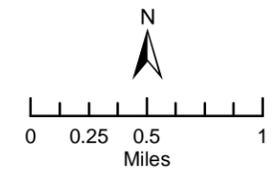
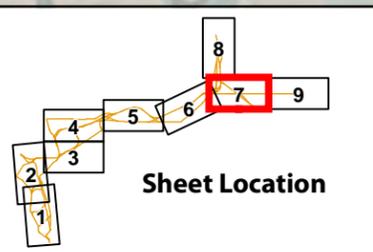
**Alternatives Analysis**

**Williamson Act Lands**



- Alternatives**
- TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

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Source: California Dept. of Conservation

Williamson Act Lands, 2009

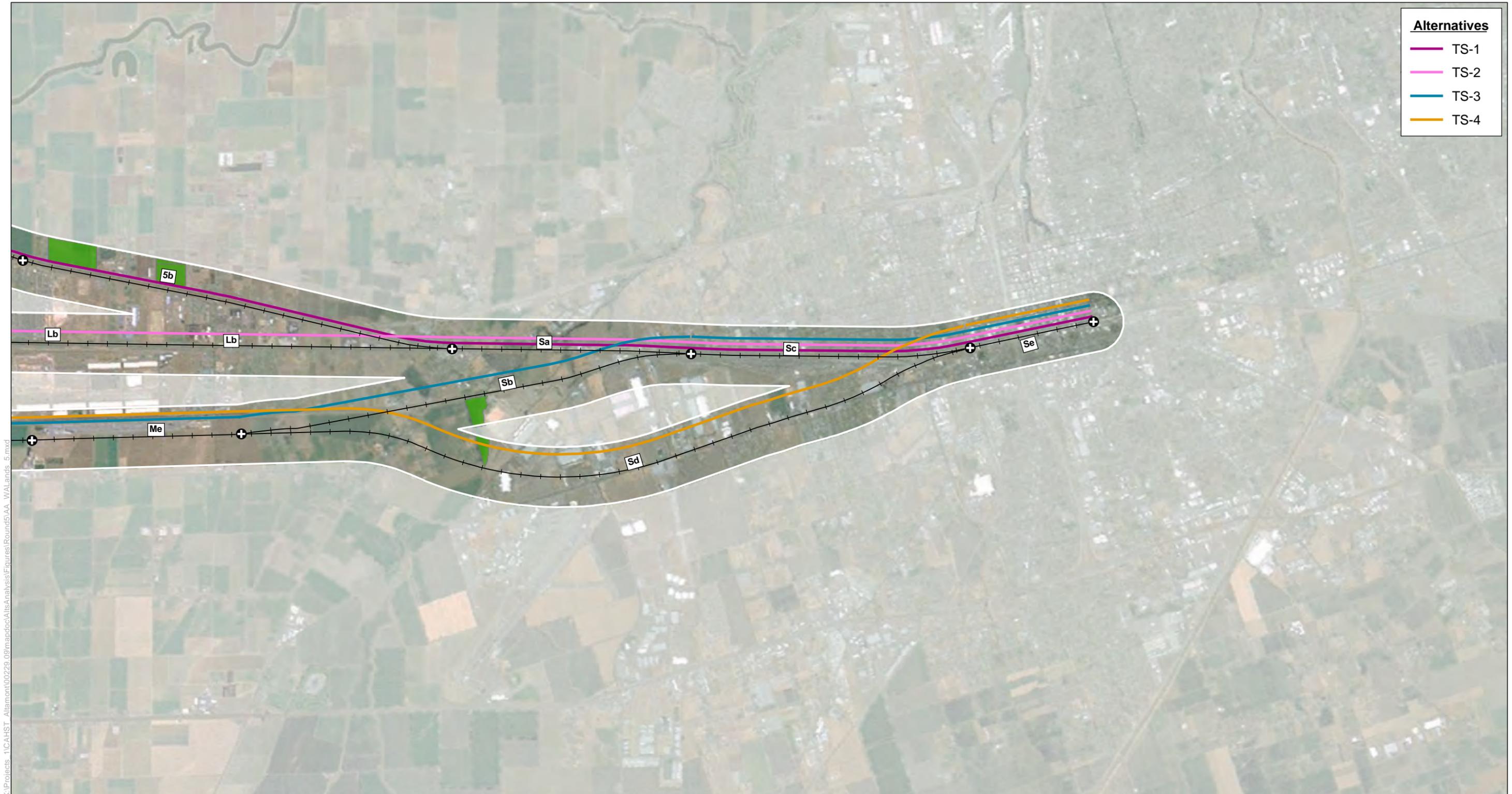
- +— Alignment Centerlines
- ▭ Quarter mile buffer area
- ⊕ Segment Endpoints
- ☐ Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Williamson Act Lands**

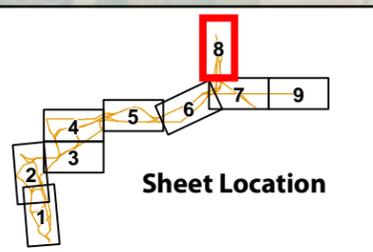
**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



**Alternatives**

- TS-1
- TS-2
- TS-3
- TS-4

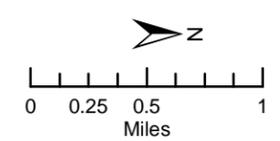
K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



Source: California Dept. of Conservation

Alignment Centerlines
 Quarter mile buffer area
 Segment Endpoints
 Segment Names

Williamson Act Lands, 2009

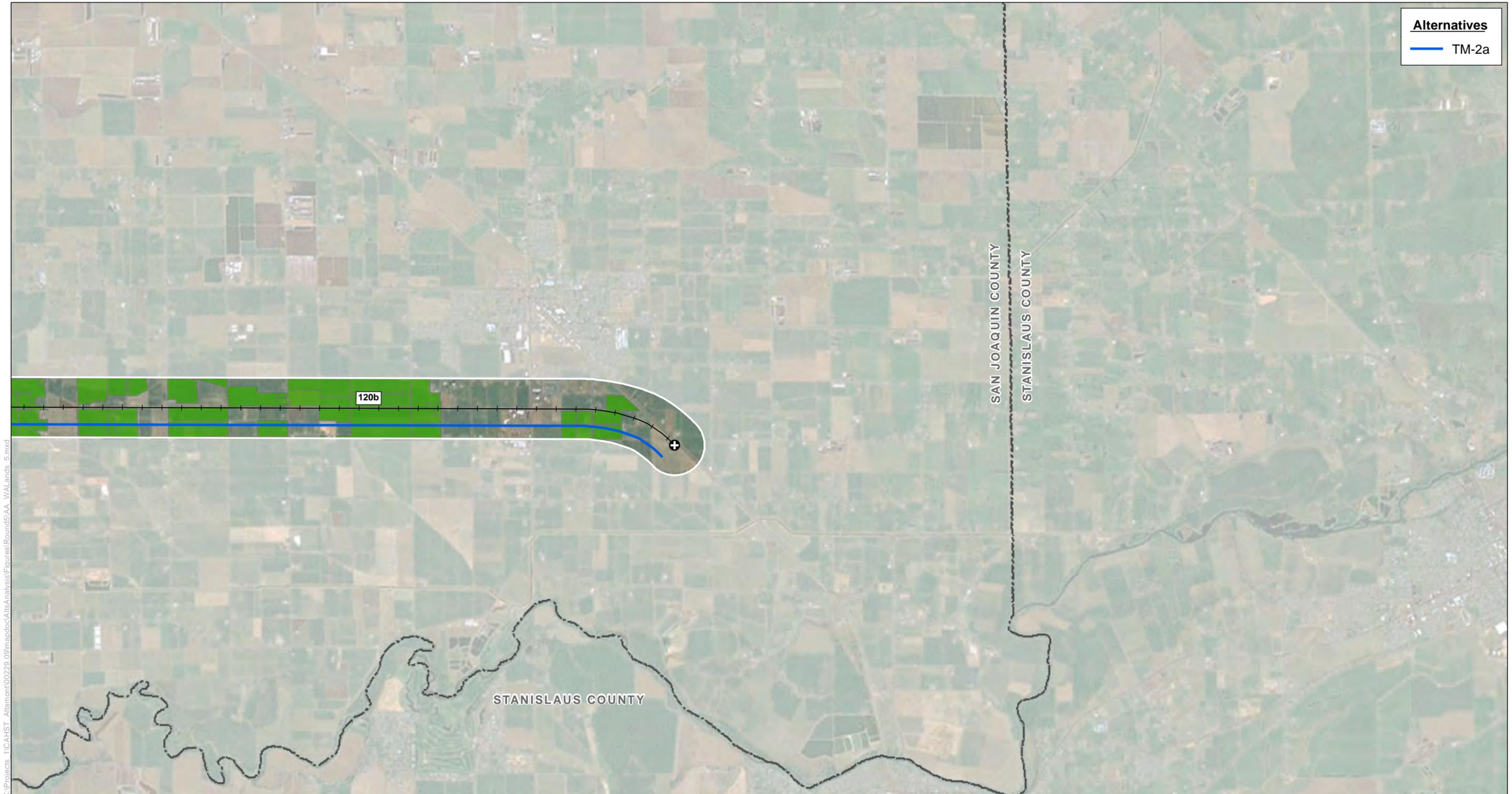


**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Williamson Act Lands**

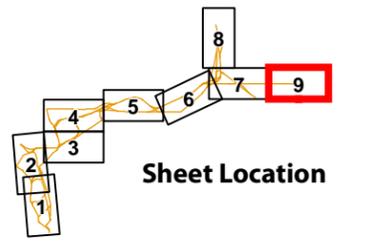
**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



**Alternatives**

— TM-2a

K:\Projects\1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_WALands\_5.mxd



Source: California Dept. of Conservation

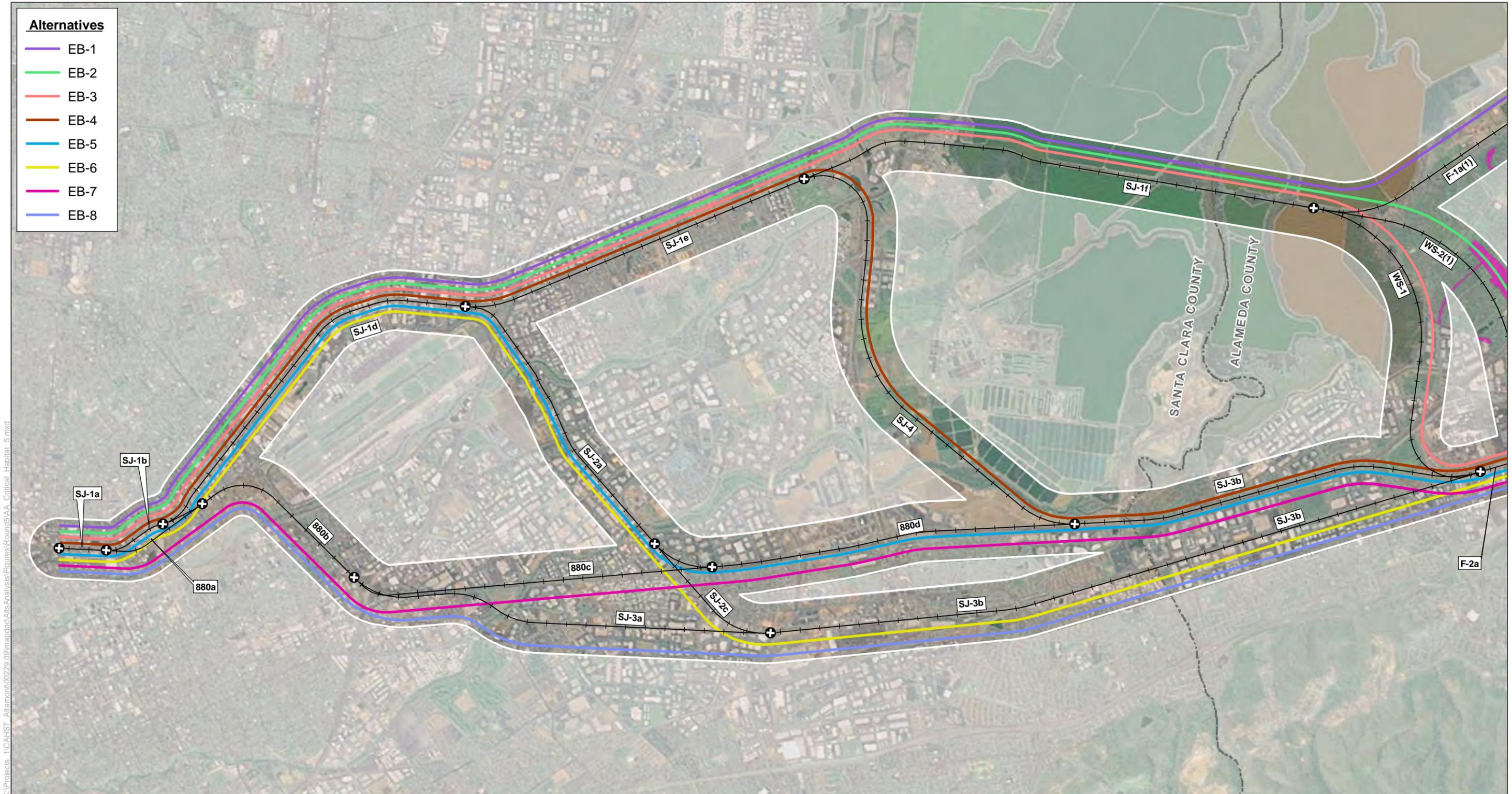
0 0.25 0.5 1 Miles

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

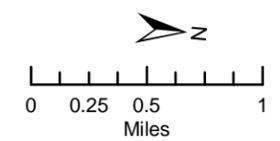
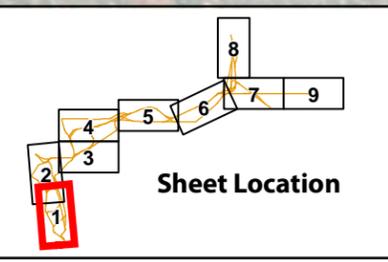
**Altamont Corridor Rail Project**

**Alternatives Analysis**  
**Williamson Act Lands**

**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



K:\Projects\1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\Round5\AA\_Critical\_Habitat\_5.mxd



Source: U.S. Fish & Wildlife Service

**Critical Habitat**

- Alameda whipsnake
- Contra Costa goldfields
- Vernal pool tadpole shrimp
- California red-legged frog
- Vernal pool fairy shrimp
- Delta smelt and salmonid species

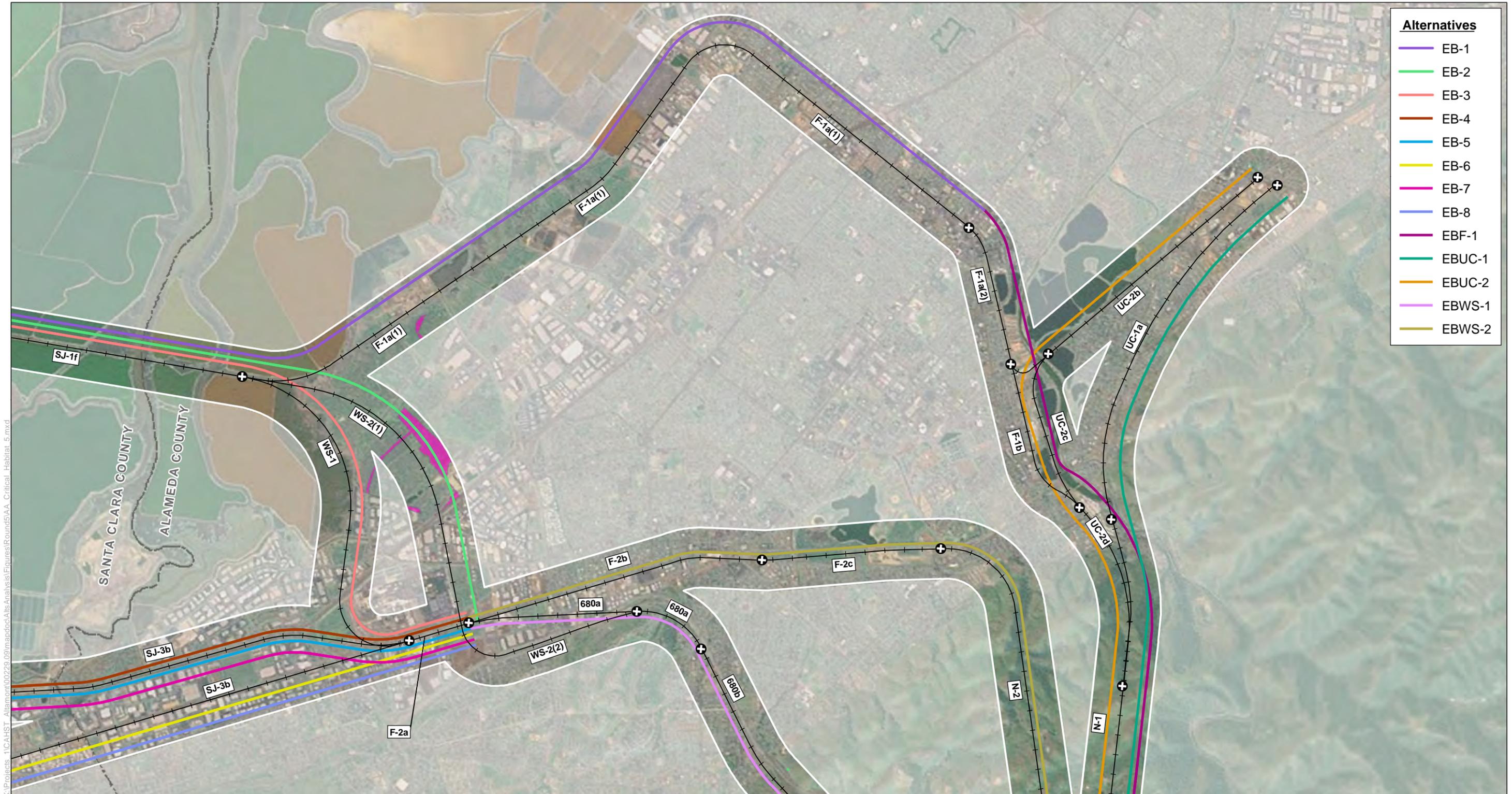
- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

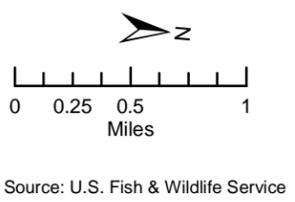
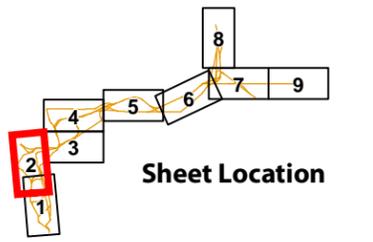
**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EB-1
  - EB-2
  - EB-3
  - EB-4
  - EB-5
  - EB-6
  - EB-7
  - EB-8
  - EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2

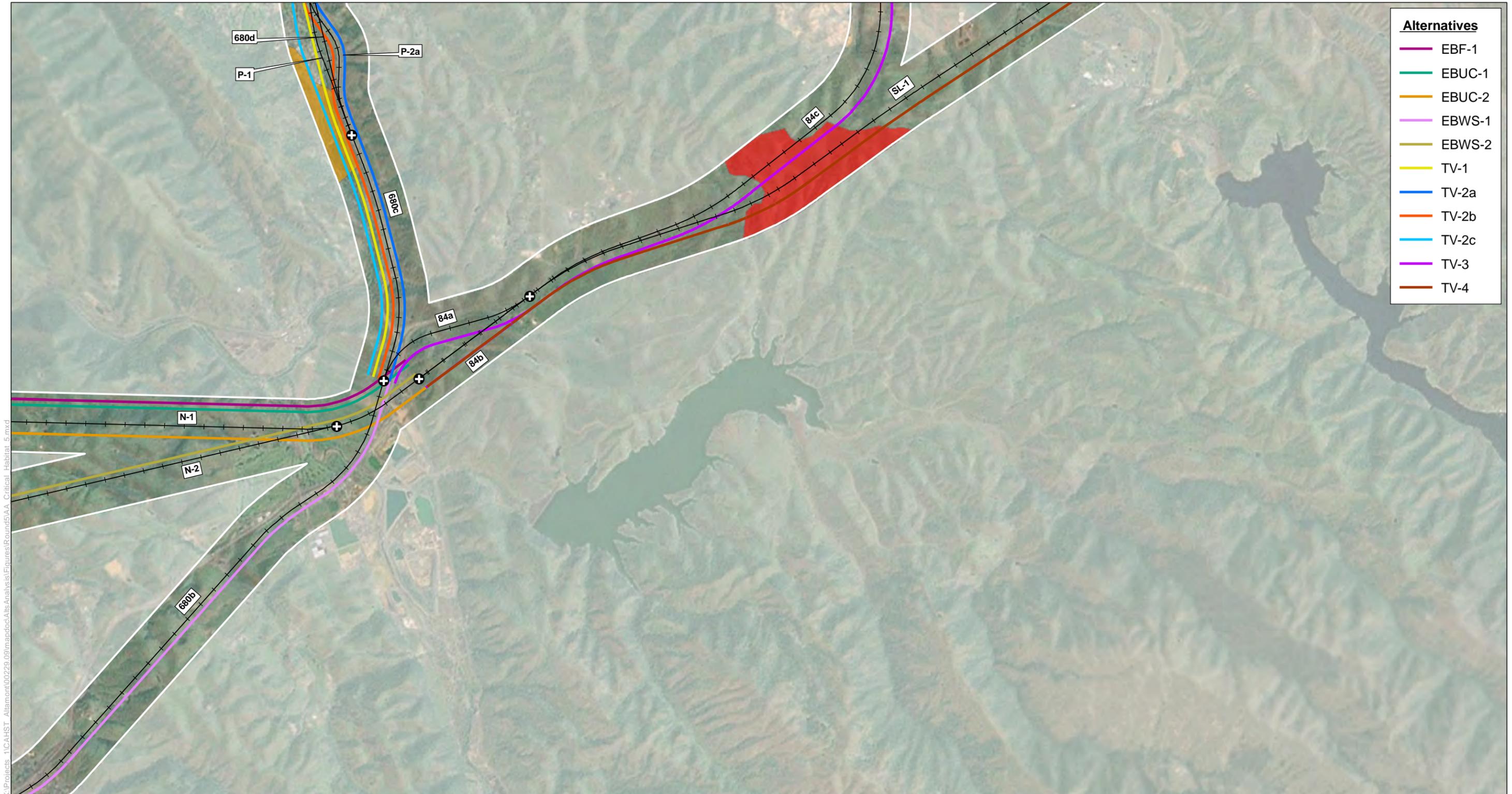
K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\Round5\AA Critical\_Habitat\_5.mxd



- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines    □ Quarter mile buffer area    ⊕ Segment Endpoints    [SJ-3a] Segment Names

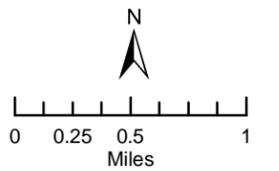
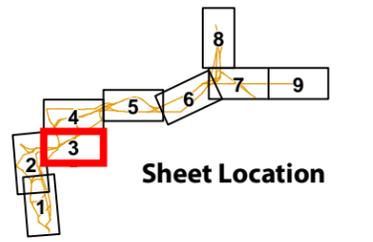
**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2
  - TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

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- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines  
 □ Quarter mile buffer area  
 ⊕ Segment Endpoints  
 [SJ-3a] Segment Names

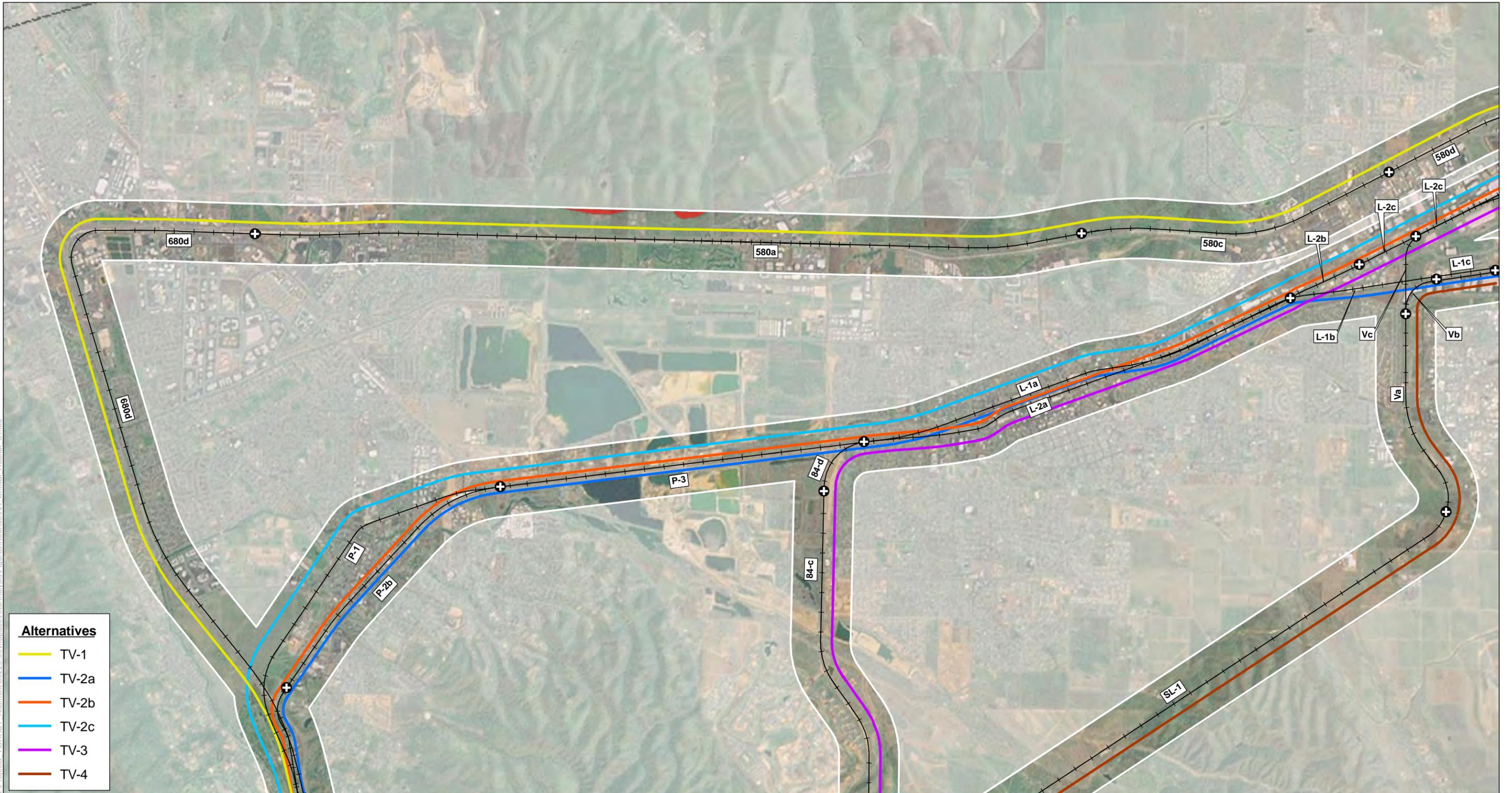
**Altamont Corridor Rail Project**

**Alternatives Analysis**

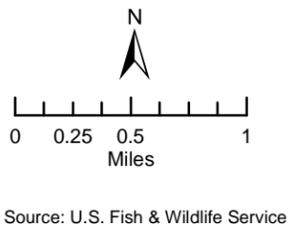
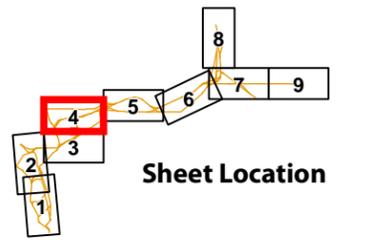
**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

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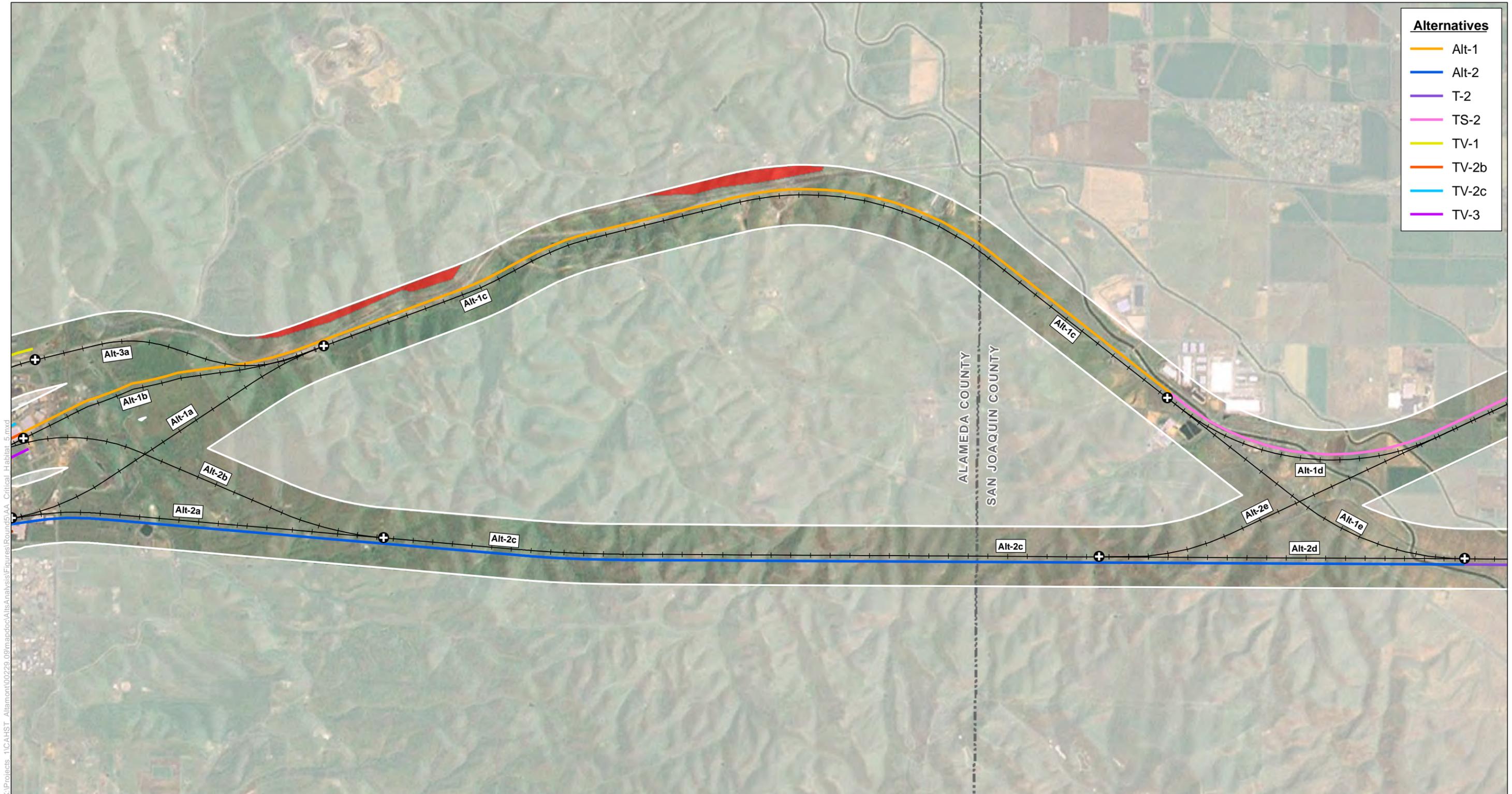
- Alternatives**
- TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4



- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines  
 □ Quarter mile buffer area  
 ⊕ Segment Endpoints  
 [SJ-3a] Segment Names

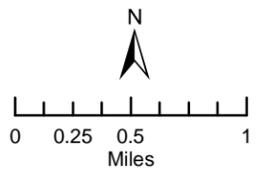
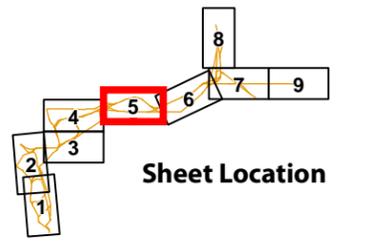
**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- Alt-1
  - Alt-2
  - T-2
  - TS-2
  - TV-1
  - TV-2b
  - TV-2c
  - TV-3

K:\Projects\1\CAHST\Altamont\0229\_09\mapdoc\AltsAnalysis\Figures\Round5\AAA\_Critical\_Habitat\_5.mxd



Source: U.S. Fish & Wildlife Service

- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines    Quarter mile buffer area    + Segment Endpoints    **SJ-3a** Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

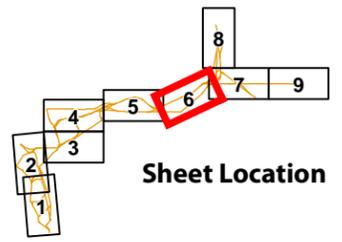
K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AIsAnalysis\Figures\Round5\AA\_Critical\_Habitat\_5.mxd



- Alternatives**
- T-1
  - T-2
  - TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

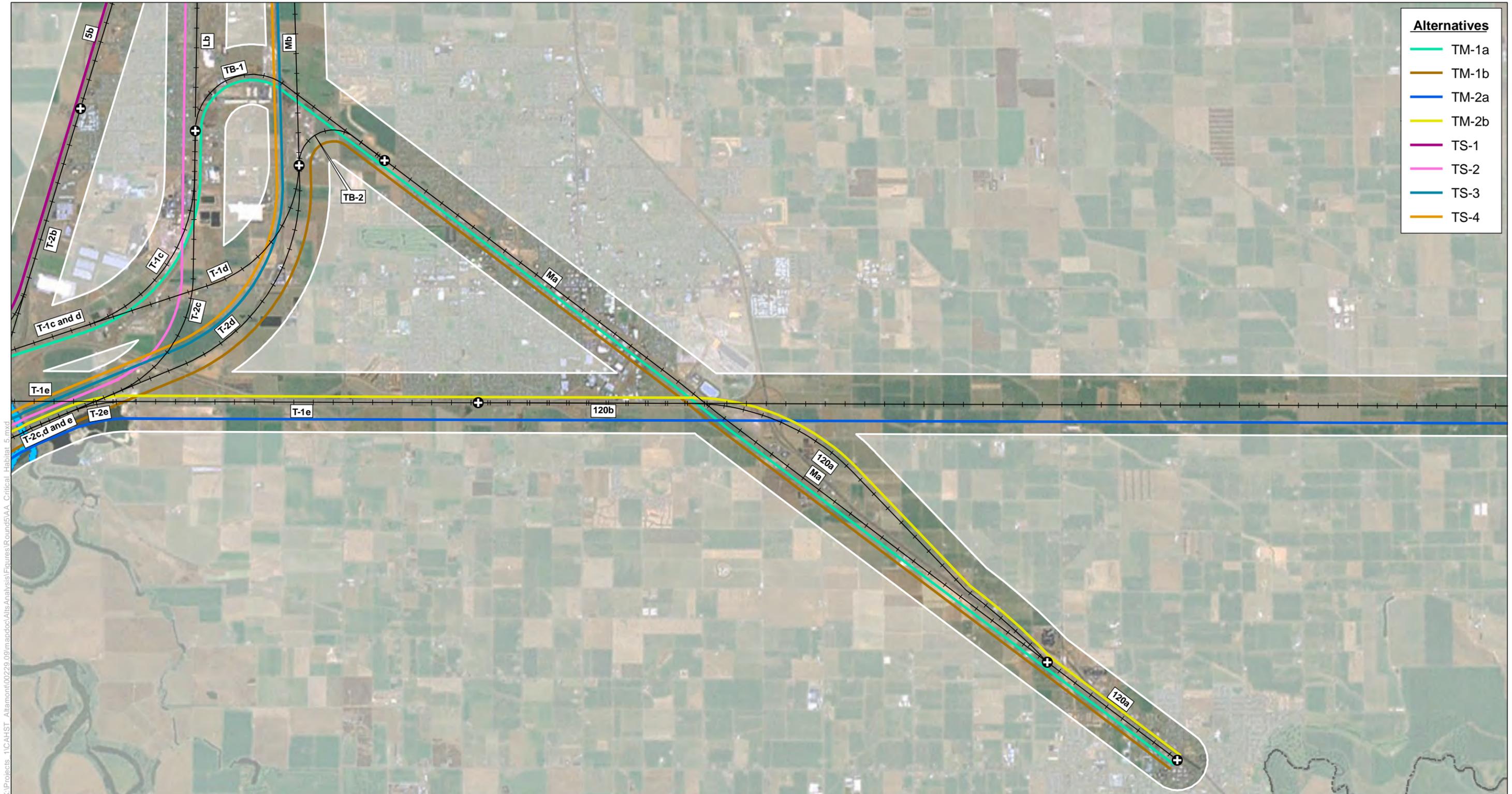
- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines  
 □ Quarter mile buffer area  
 ⊕ Segment Endpoints  
 [SJ-3a] Segment Names

**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Critical Habitat**



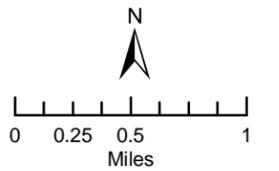
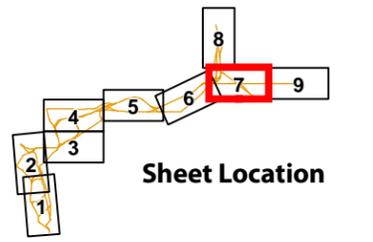
Source: U.S. Fish & Wildlife Service

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

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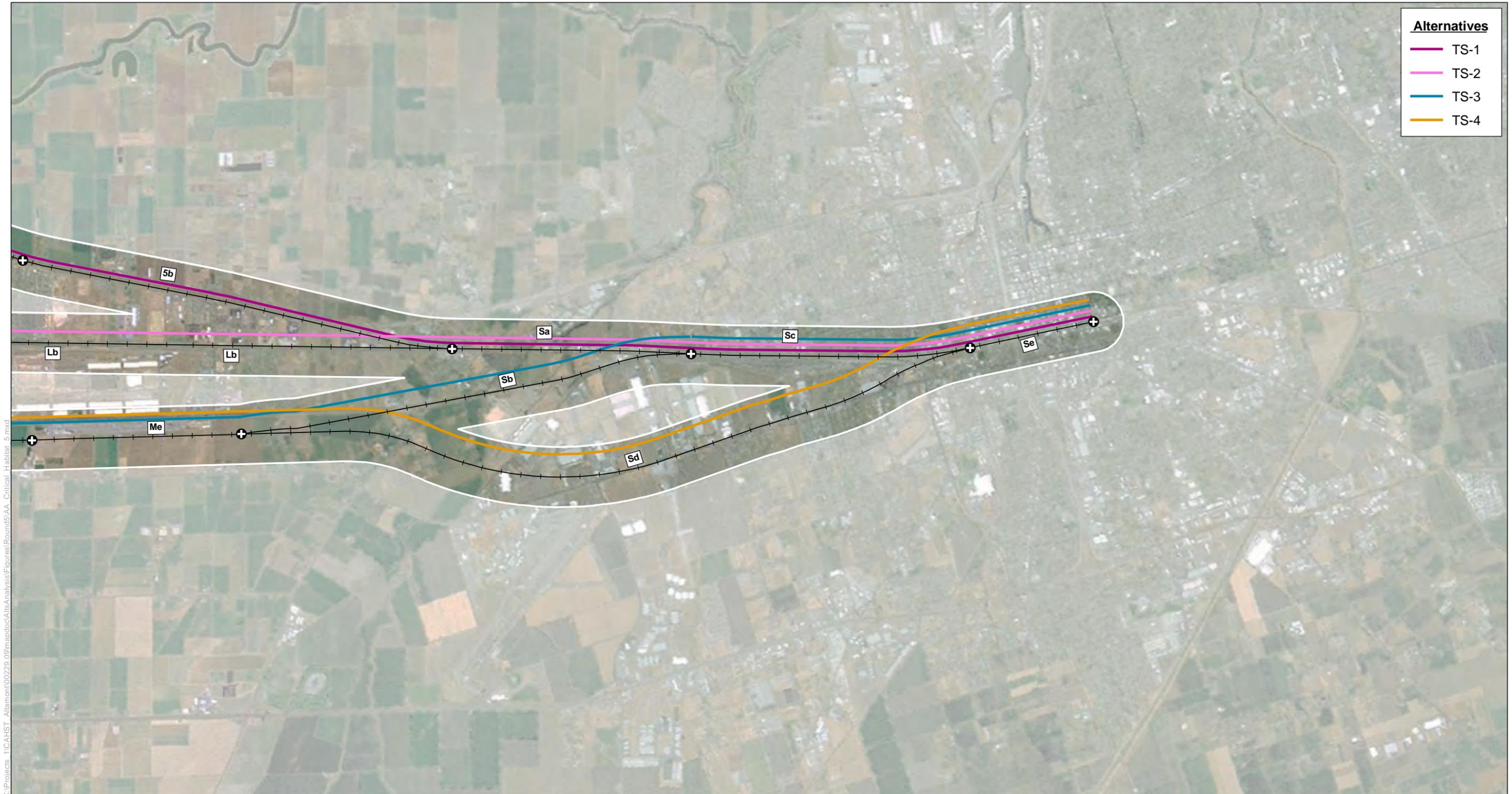
- Critical Habitat**
- Alameda whipsnake
  - California red-legged frog
  - Contra Costa goldfields
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - Delta smelt and salmonid species
- +— Alignment Centerlines  
 □ Quarter mile buffer area  
 ⊕ Segment Endpoints  
 SJ-3a Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Critical Habitat**

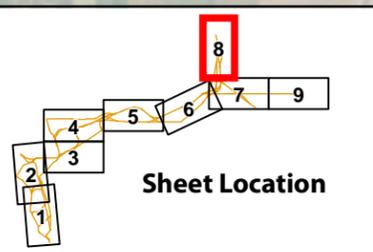
Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



**Alternatives**

- TS-1
- TS-2
- TS-3
- TS-4

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_Critical\_Habitat\_5.mxd



Source: U.S. Fish & Wildlife Service

**Critical Habitat**

- Alameda whipsnake
- Contra Costa goldfields
- Vernal pool tadpole shrimp
- California red-legged frog
- Vernal pool fairy shrimp
- Delta smelt and salmonid species

- Alignment Centerlines
- Quarter mile buffer area
- Segment Endpoints
- Segment Names

**Altamont Corridor Rail Project**

**Alternatives Analysis**

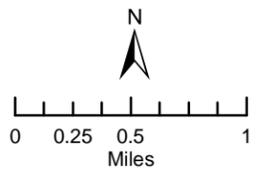
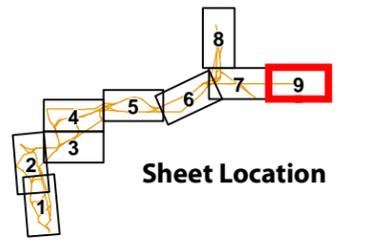
**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

K:\Projects\_1\CAHST\_Altamont\0229\_09\mapdoc\AItsAnalysis\Figures\Round5\AA\_Critical\_Habitat\_5.mxd



**Alternatives**  
— TM-2a



Source: U.S. Fish & Wildlife Service

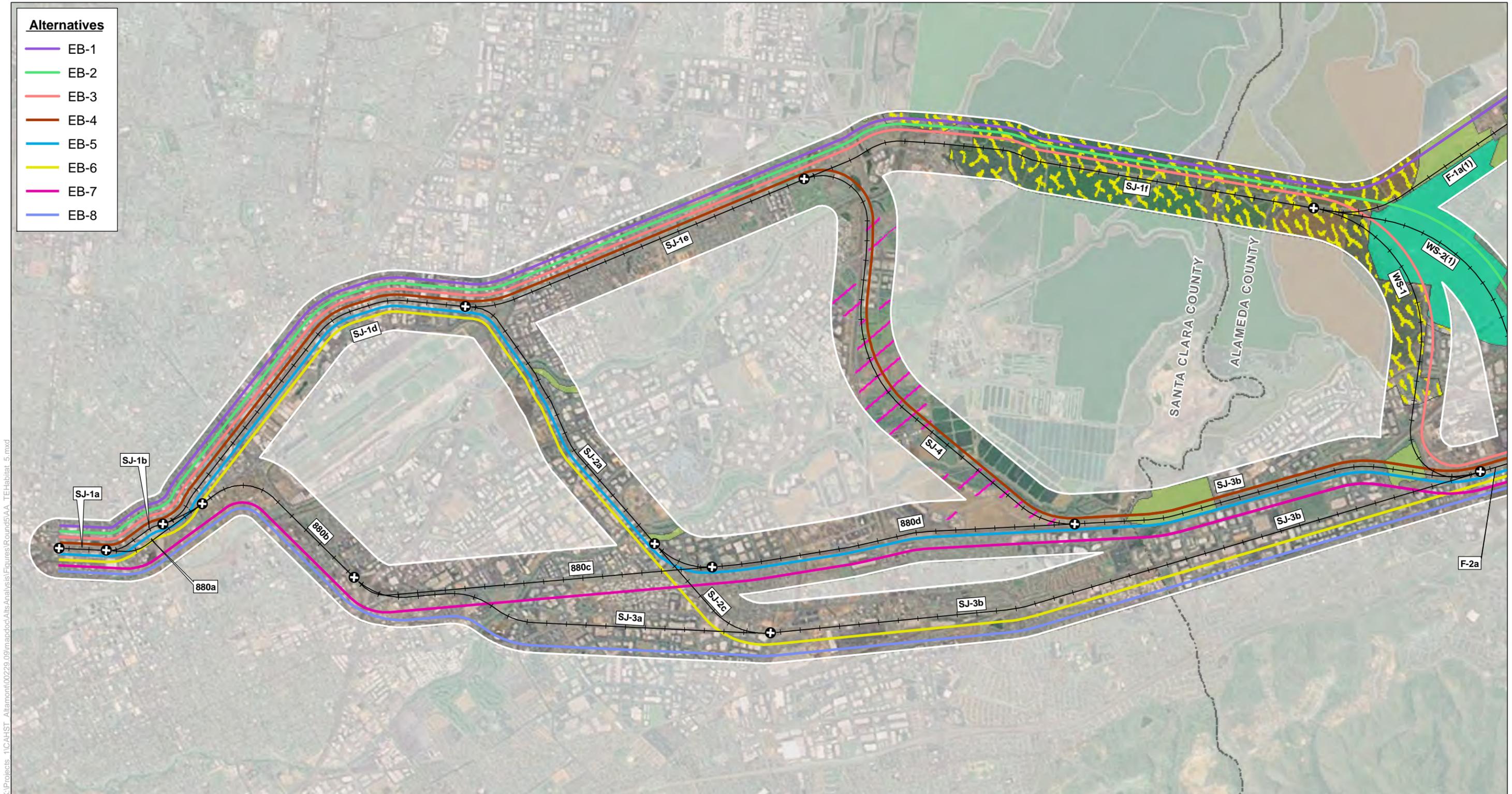
- Critical Habitat**
- Alameda whipsnake
  - Contra Costa goldfields
  - Vernal pool tadpole shrimp
  - California red-legged frog
  - Vernal pool fairy shrimp
  - Delta smelt and salmonid species
  - Alignment Centerlines
  - Quarter mile buffer area
  - + Segment Endpoints
  - SJ-3a Segment Names

**Altamont Corridor Rail Project**

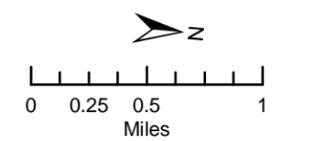
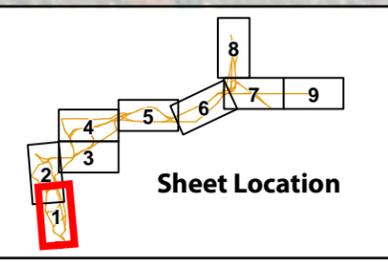
**Alternatives Analysis**

**Critical Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



K:\Projects\_1\CAHST\_Altamont\00229\_09\mapdoc\AIsAnalysis\Figures\Round5\AA\_TE\Habitat\_5.mxd



Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

- California tiger salamander
- vernal pool species
- Swainson's hawk
- California red-legged frog
- Quarter mile buffer area
- Alignment Centerlines
- Segment Endpoints

- California clapper rail, salt marsh harvest mouse and/or western snowy plover
- San Joaquin kit fox
- Delta smelt and salmonid species

Note: Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

—+— Segment Names SJ-3a - Segment Names

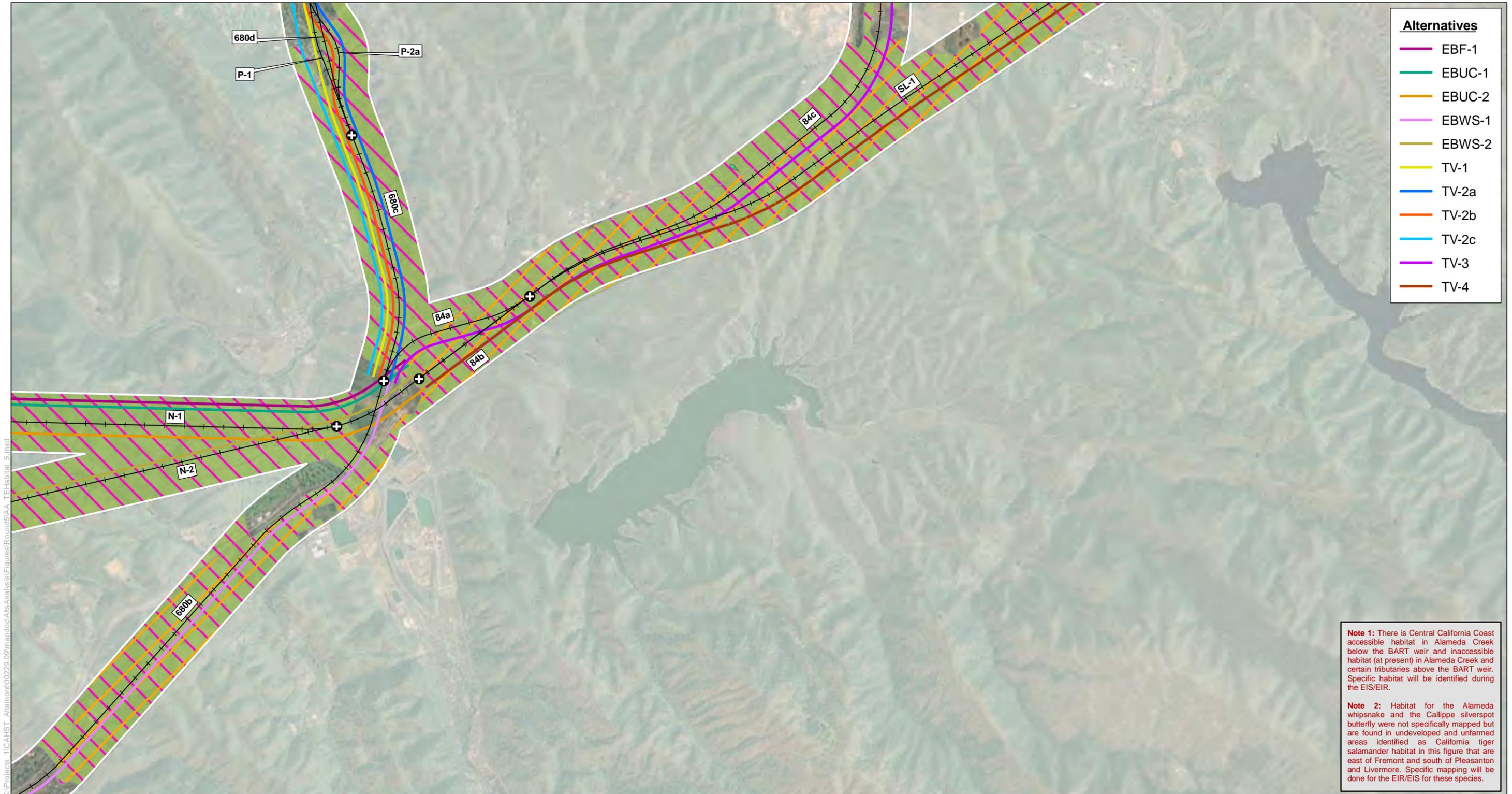
**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Potential Areas of Threatened and Endangered Species Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



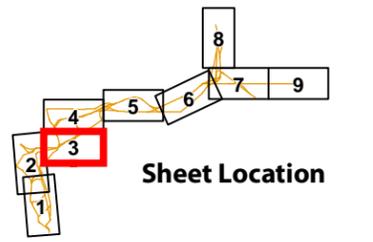


- Alternatives**
- EBF-1
  - EBUC-1
  - EBUC-2
  - EBWS-1
  - EBWS-2
  - TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

**Note 1:** There is Central California Coast accessible habitat in Alameda Creek below the BART weir and inaccessible habitat (at present) in Alameda Creek and certain tributaries above the BART weir. Specific habitat will be identified during the EIS/EIR.

**Note 2:** Habitat for the Alameda whipsnake and the Callippe silverspot butterfly were not specifically mapped but are found in undeveloped and unfarmed areas identified as California tiger salamander habitat in this figure that are east of Fremont and south of Pleasanton and Livermore. Specific mapping will be done for the EIR/EIS for these species.

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Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

California tiger salamander	Swainson's hawk	California clapper rail, salt marsh harvest mouse and/or western snowy plover
vernal pool species	California red-legged frog	San Joaquin kit fox
Alignment Centerlines	Quarter mile buffer area	Delta smelt and salmonid species
	Segment Endpoints	SJ-3a - Segment Names

Note: Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

**Altamont Corridor Rail Project**

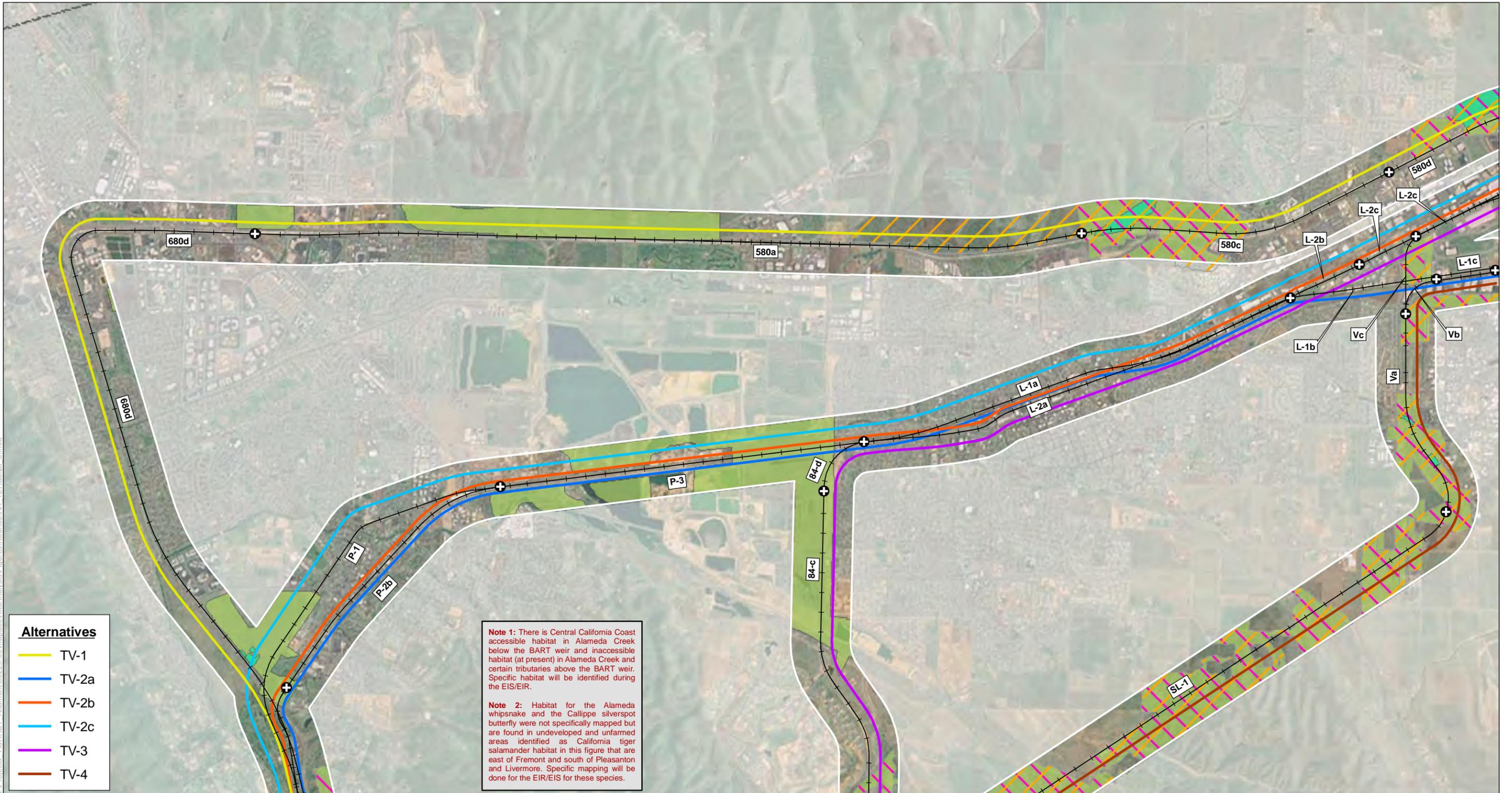
**Alternatives Analysis**

**Potential Areas of Threatened and Endangered Species Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

Sheet 3 of 9

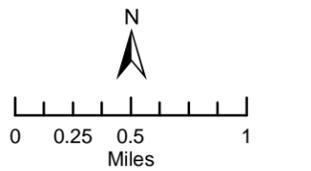
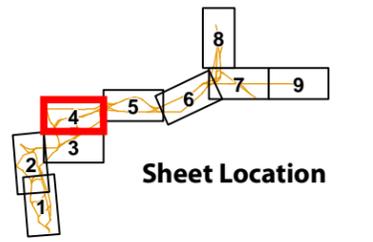
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- Alternatives**
- TV-1
  - TV-2a
  - TV-2b
  - TV-2c
  - TV-3
  - TV-4

**Note 1:** There is Central California Coast accessible habitat in Alameda Creek below the BART weir and inaccessible habitat (at present) in Alameda Creek and certain tributaries above the BART weir. Specific habitat will be identified during the EIS/EIR.

**Note 2:** Habitat for the Alameda whipsnake and the Callippe silverspot butterfly were not specifically mapped but are found in undeveloped and unfarmed areas identified as California tiger salamander habitat in this figure that are east of Fremont and south of Pleasanton and Livermore. Specific mapping will be done for the EIR/EIS for these species.



Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

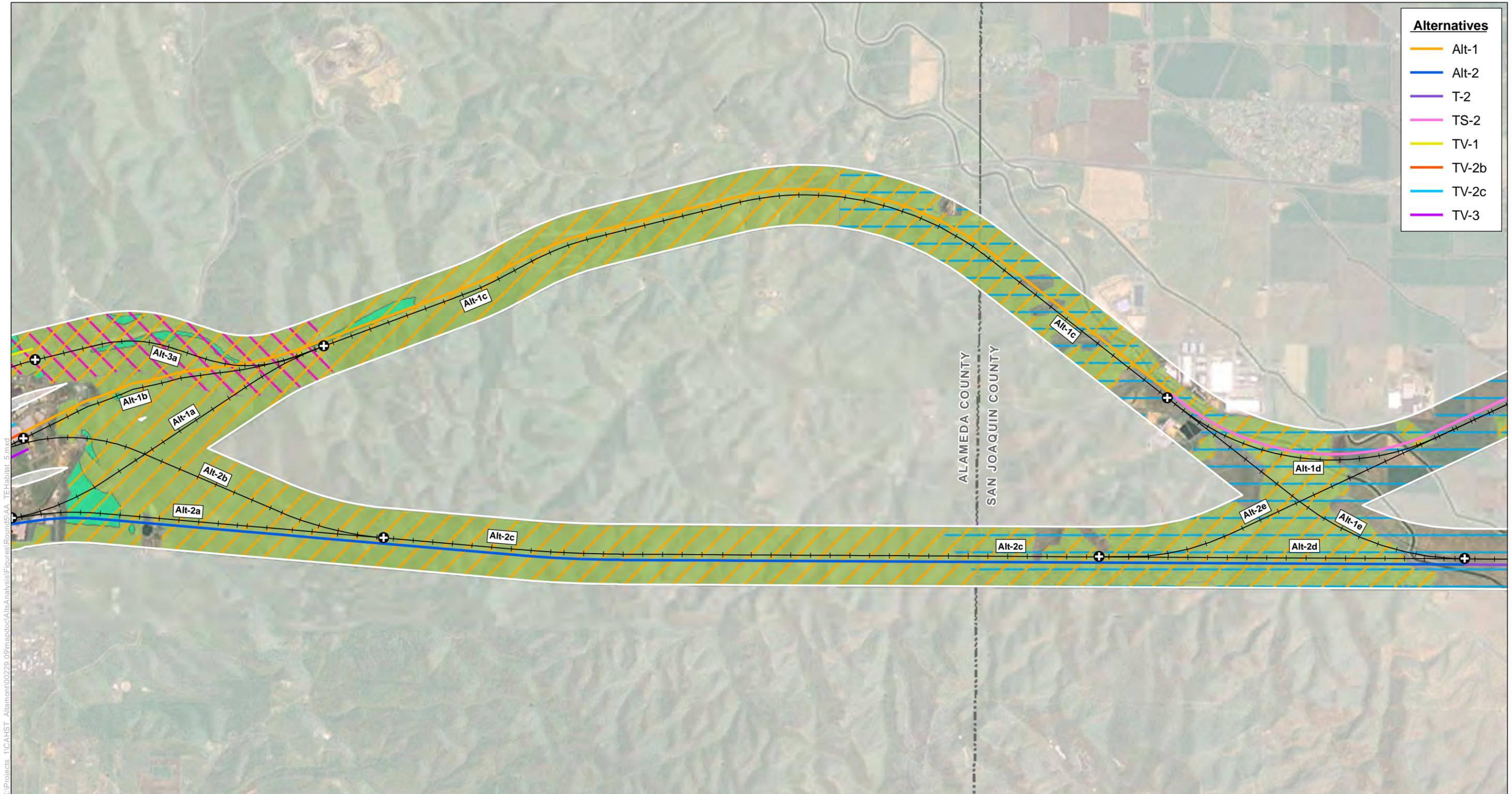
**Potential Areas of Threatened and Endangered Species Habitat**

California tiger salamander	Swainson's hawk	California clapper rail, salt marsh harvest mouse and/or western snowy plover
vernal pool species	California red-legged frog	San Joaquin kit fox
Alignment Centerlines	Quarter mile buffer area	Delta smelt and salmonid species
	Segment Endpoints	<b>SJ-3a - Segment Names</b>

Note: Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

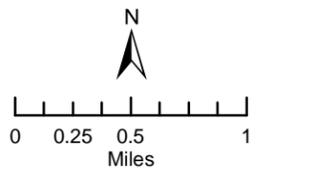
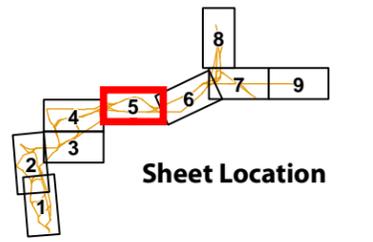
**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Potential Areas of Threatened and Endangered Species Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



- Alternatives**
- Alt-1
  - Alt-2
  - T-2
  - TS-2
  - TV-1
  - TV-2b
  - TV-2c
  - TV-3

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Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

- |                             |                            |   |
|-----------------------------|----------------------------|---|
| California tiger salamander | Swainson's hawk            | California clapper rail, salt marsh harvest mouse and/or western snowy plover |
| vernal pool species         | California red-legged frog | San Joaquin kit fox   |
| Alignment Centerlines       | Quarter mile buffer area   | Delta smelt and salmonid species  |
| Alignment Centerlines       | Segment Endpoints          | Segment Endpoints   |
- Note: Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Potential Areas of Threatened and Endangered Species Habitat**

Note: The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.



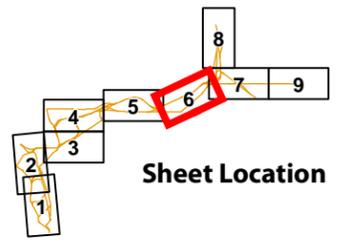
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- Alternatives**
- T-1
  - T-2
  - TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

- Potential Areas of Threatened and Endangered Species Habitat**
- California tiger salamander
  - Swainson's hawk
  - California clapper rail, salt marsh harvest mouse and/or western snowy plover
  - vernal pool species
  - California red-legged frog
  - San Joaquin kit fox
  - Delta smelt and salmonid species
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- Alignment Centerlines
  - Quarter mile buffer area
  - Segment Endpoints

**Altamont Corridor Rail Project**  
**Alternatives Analysis**  
**Potential Areas of Threatened and Endangered Species Habitat**

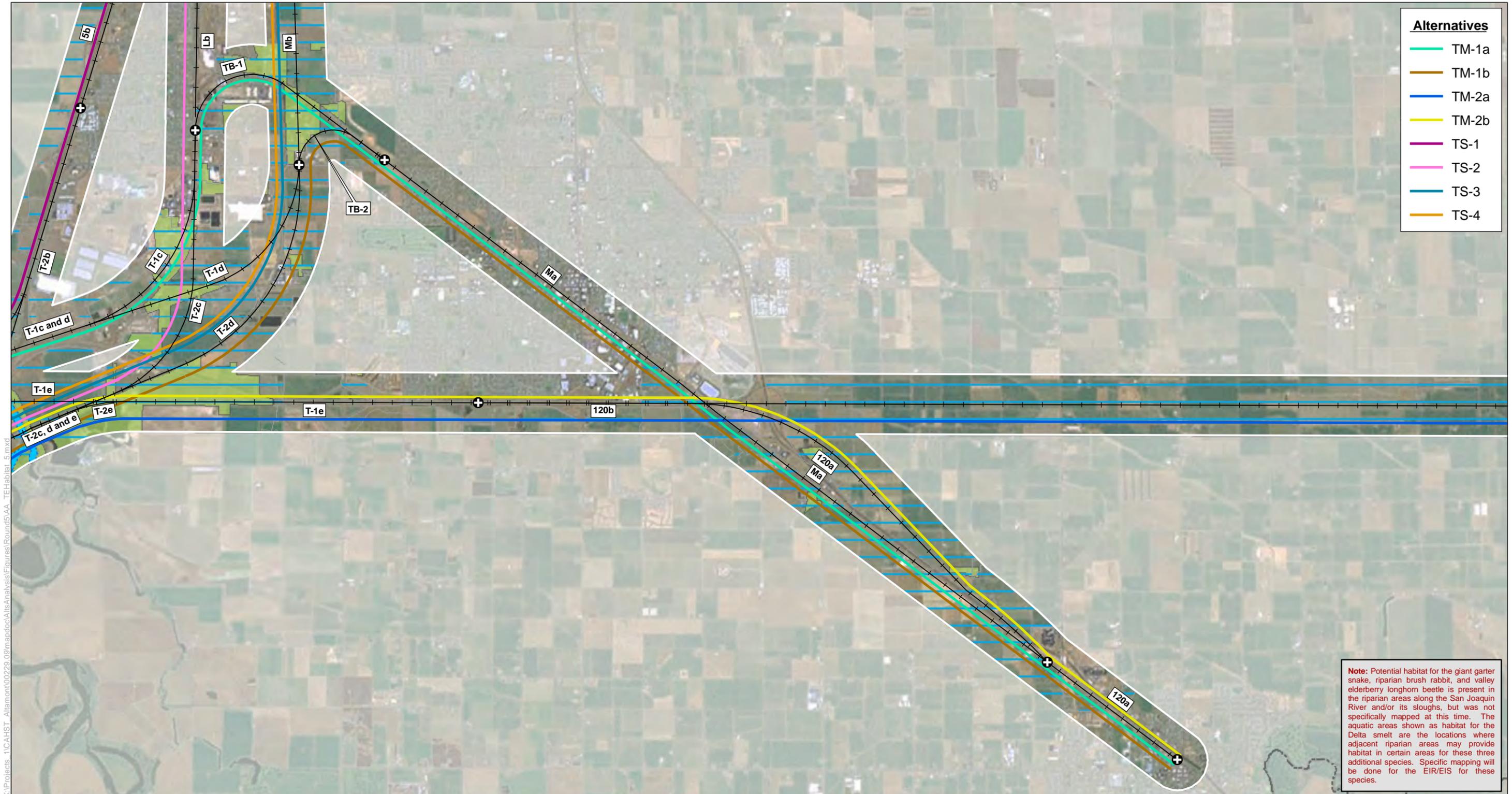
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0 0.25 0.5 1  
Miles

Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

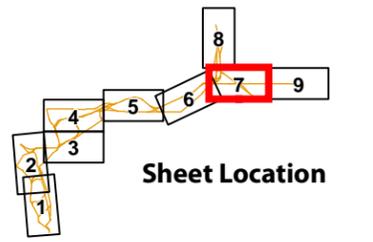
SJ-3a - Segment Names



- Alternatives**
- TM-1a
  - TM-1b
  - TM-2a
  - TM-2b
  - TS-1
  - TS-2
  - TS-3
  - TS-4

**Note:** Potential habitat for the giant garter snake, riparian brush rabbit, and valley elderberry longhorn beetle is present in the riparian areas along the San Joaquin River and/or its sloughs, but was not specifically mapped at this time. The aquatic areas shown as habitat for the Delta smelt are the locations where adjacent riparian areas may provide habitat in certain areas for these three additional species. Specific mapping will be done for the EIR/EIS for these species.

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Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

California tiger salamander	Swainson's hawk	California clapper rail, salt marsh harvest mouse and/or western snowy plover
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Alignment Centerlines	Quarter mile buffer area	Delta smelt and salmonid species

**Note:** Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

Segment Endpoints    **SJ-3a - Segment Names**

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Potential Areas of Threatened and Endangered Species Habitat**

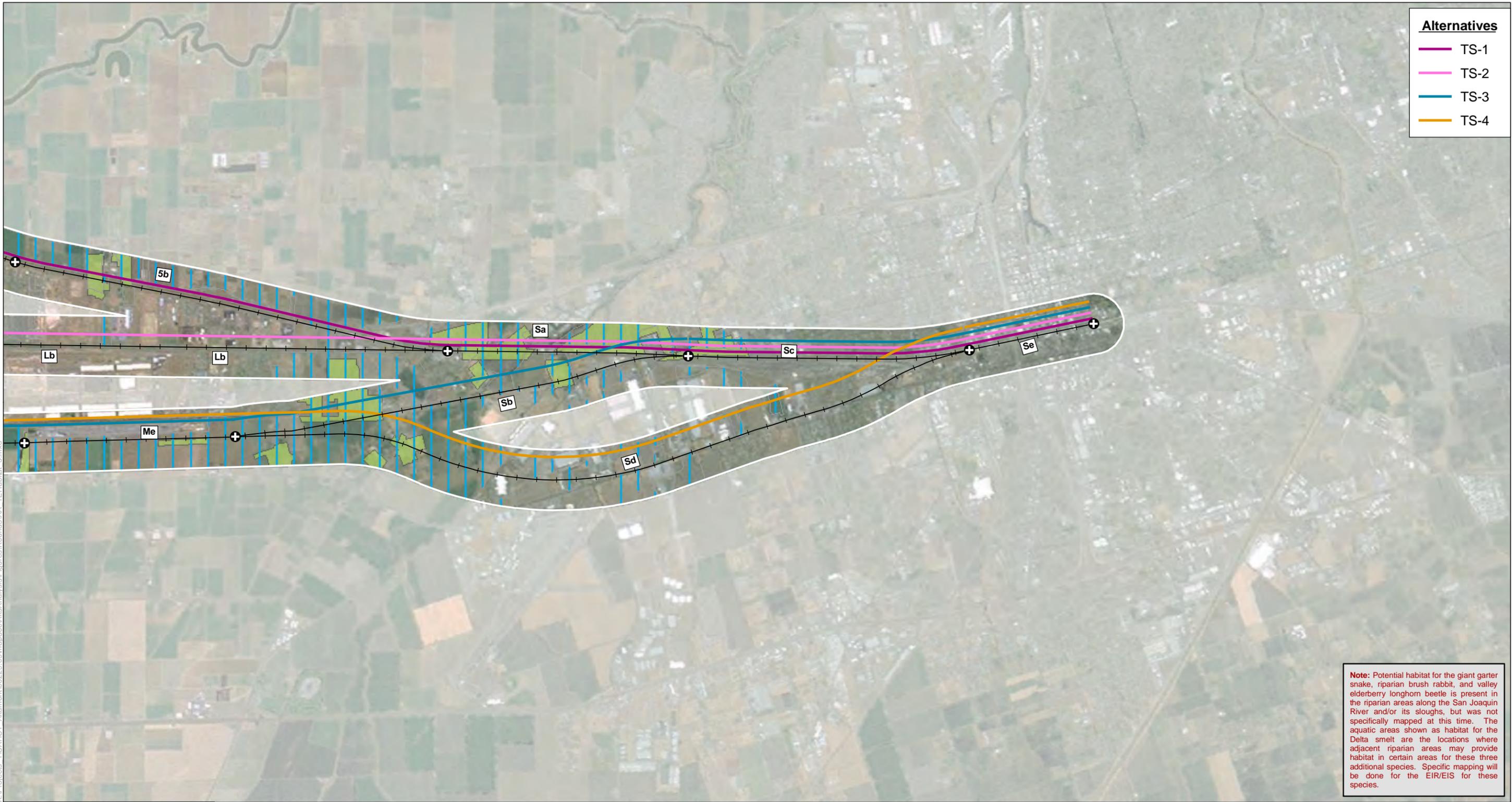
**Note:** The displayed buffer area varies from the project study area boundary to reflect the geographical extent of the environmental resource and to provide an overall context.

Sheet 7 of 9

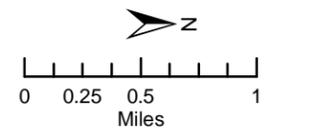
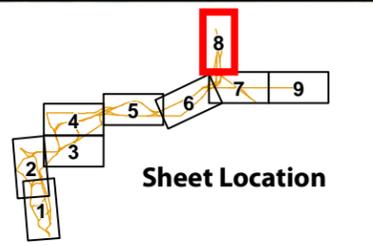
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**Alternatives**

- TS-1
- TS-2
- TS-3
- TS-4



**Note:** Potential habitat for the giant garter snake, riparian brush rabbit, and valley elderberry longhorn beetle is present in the riparian areas along the San Joaquin River and/or its sloughs, but was not specifically mapped at this time. The aquatic areas shown as habitat for the Delta smelt are the locations where adjacent riparian areas may provide habitat in certain areas for these three additional species. Specific mapping will be done for the EIR/EIS for these species.



Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

- California tiger salamander
- vernal pool species
- Swainson's hawk
- California red-legged frog
- San Joaquin kit fox
- Delta smelt and salmonid species
- California clapper rail, salt marsh harvest mouse and/or western snowy plover
- Quarter mile buffer area
- Segment Endpoints
- Alignment Centerlines

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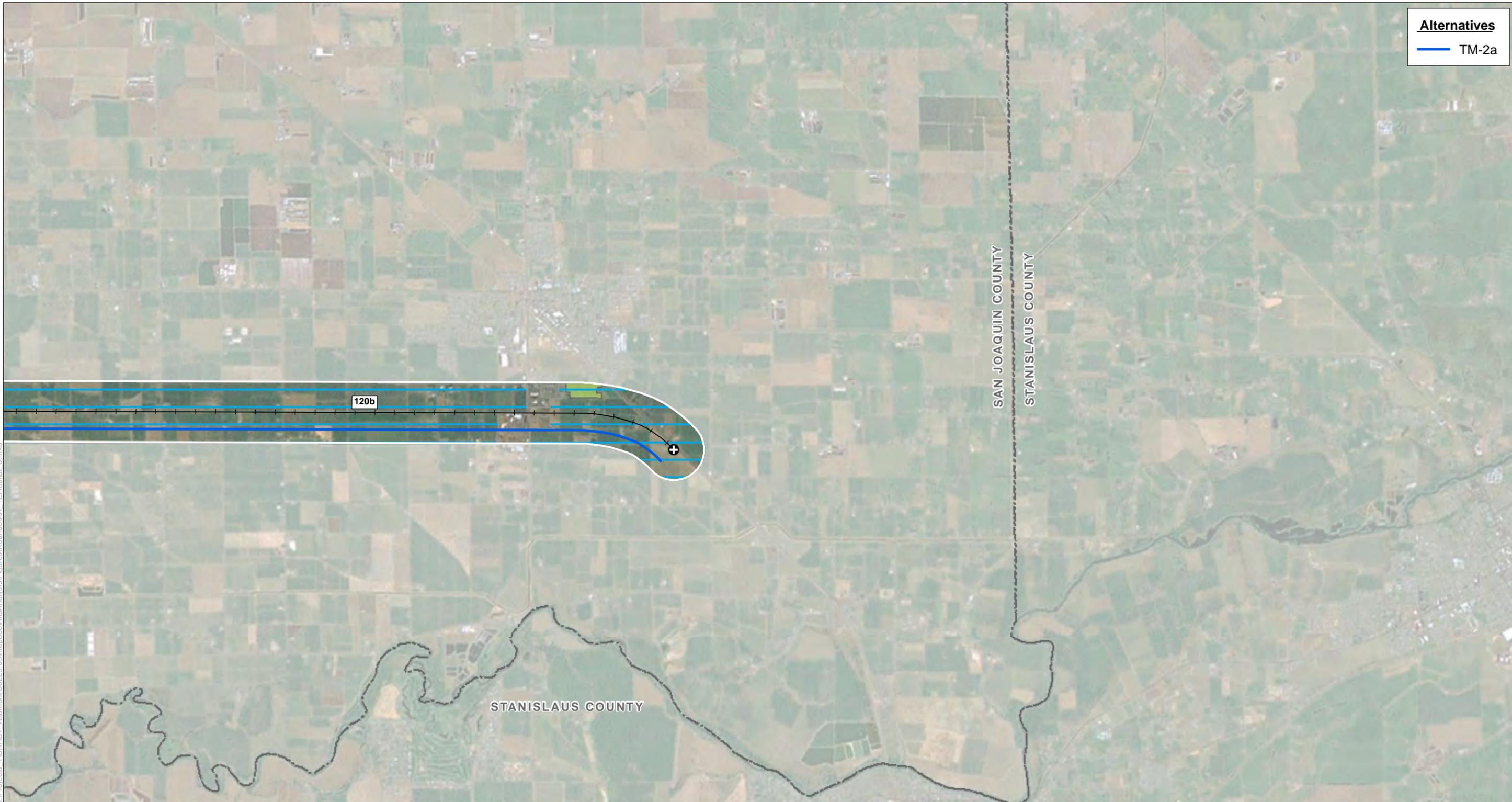
**Altamont Corridor Rail Project**

**Alternatives Analysis**

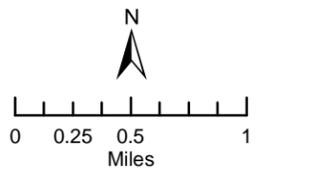
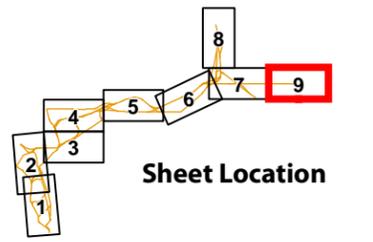
**Potential Areas of Threatened and Endangered Species Habitat**

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**Alternatives**  
— TM-2a



Sources: California Dept. of Fish & Game, California Habitat Wildlife Relationships database; Holland vernal pools database

**Potential Areas of Threatened and Endangered Species Habitat**

- California tiger salamander
- vernal pool species
- Swainson's hawk
- California red-legged frog
- San Joaquin kit fox
- Delta smelt and salmonid species
- California clapper rail, salt marsh harvest mouse and/or western snowy plover
- Quarter mile buffer area
- Segment Endpoints
- Alignment Centerlines

Note: Only the colors of line hatching representing species habitat on the map will match the legend symbols. The lines on the map may be displayed at a different angle than shown in the legend

**Altamont Corridor Rail Project**

**Alternatives Analysis**

**Potential Areas of Threatened and Endangered Species Habitat**

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**Appendix G**  
**ACRONYMS AND ABBREVIATIONS**



**Appendix G**  
**ACRONYMS AND ABBREVIATIONS**

AA Report	alternatives analysis report
ABAG	Association of Bay Area Governments
AC Transit	Alameda County Transit
ACE	Altamont Commuter Express
ACTC	Alameda County Transportation Commission
BART	Bay Area Rapid Transit
BART	San Francisco Bay Area Rapid Transit District
BNSF	Burlington Northern Santa Fe Railroad
Caltrans	California Department of Transportation
CCTA	County Connection
CEQA	California Environmental Quality Act
CHRIS	California Historic Resources Information System
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
EBRPD	East Bay Regional Park District
EDR	Environmental Data Research
EIR/EIS	Altamont Corridor Rail Project Environmental Impact Report/Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FAQs	Frequently Asked Questions
FRA	Federal Railroad Administration
GIS	Geographic Information Systems
HOV	High-occupancy vehicle
HST	High Speed Train
HST	Statewide High Speed Train
I-205	Interstate 205
I-580	Interstate 580
IDA	Initial Development of Alternatives
ITS	intelligent transportation system
LARPD	Livermore Area Recreation and Park District
LAVTA/Wheels	Livermore Amador Valley Transportation Authority
LRT	light rail transit
LVK	Livermore Municipal Airport
MAX	Modesto Area Express
MOD	Modesto City-County Airport

MOU	memorandum of understanding
mph	miles per hour
MTC	Metropolitan Transportation Commission
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NOP	Notice of Preparation
NRHP	National Register of Historic Places
NUMMI	New United Motor Manufacturing, Inc.
OAK	Oakland International Airport
PAC	Policy Advisory Committee
Resource TWG	resource agency technical working group
RT	Sacramento Regional Transit District
RTP	Regional Transportation Plan
SamTrans	San Mateo County Transit
San Joaquin RTD	San Joaquin Regional Transportation District
SCK	Stockton Metropolitan Airport
SFO	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SJC	Norman Y. Mineta San Jose International Airport
SJCOG	San Joaquin Council of Governments
SJRRC	San Joaquin Regional Rail Commission
SR	State Route
STIP	State Transportation Improvement Plan
TCY	Tracy Municipal Airport
the Authority	California High-Speed Rail Authority
the Working Group	Altamont Corridor Partnership Working Group
TOD	transit-oriented development
TWG	Technical Working Group
UP	Union Pacific Railroad
US 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
VMT	vehicle miles traveled
VTA	Valley Transportation Authority
WPRR	Western Pacific Railroad