TRILINK (SR 239)

FEASIBILITY STUDY FINAL REPORT

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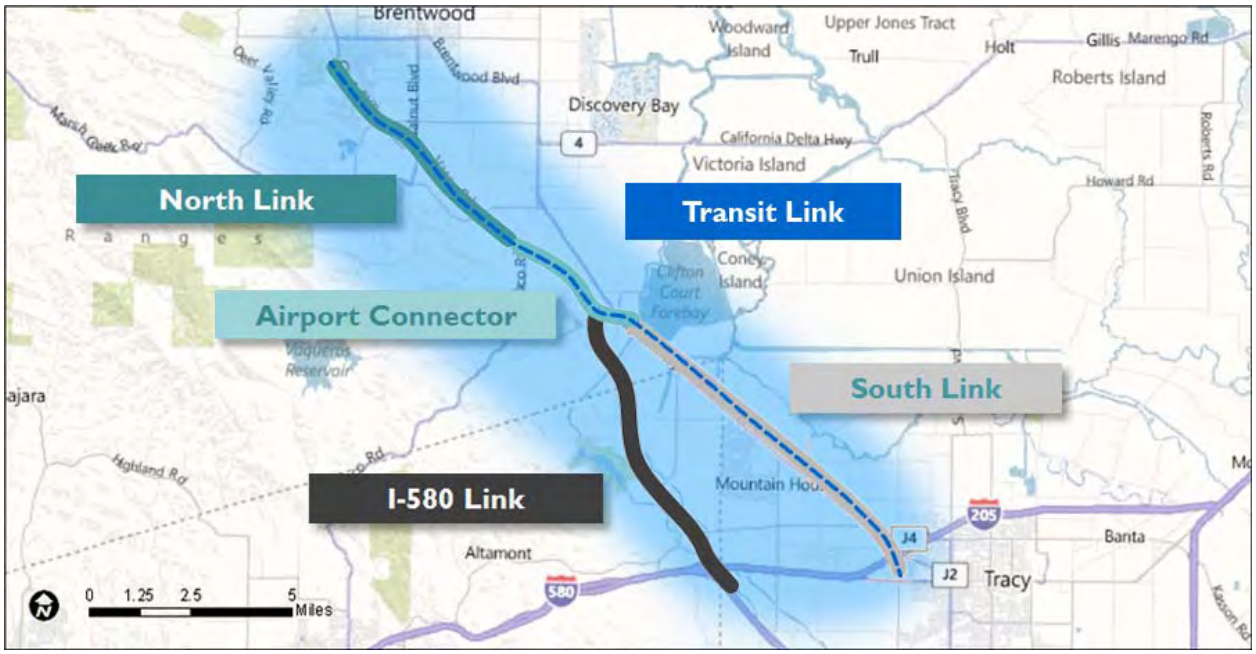
Executive Summary

Background

In 2005, Contra Costa County received two federal appropriations totaling $14 million. The federal appropriations were to be used to evaluate a new multimodal transportation alignment that could link State Route (SR) 4 near Brentwood to Interstate 205 (I-205) or Interstate 580 (I-580) west of Tracy in San Joaquin County (see Figure ES-1). SR 239 is a legislatively designated facility intended for this alignment.

In 2012, a multijurisdictional partnership was established, and Contra Costa Transportation Authority (CCTA) initiated the TriLink (SR 239) study. This facility could potentially improve access for those who live and work in the region, and could support inter-regional goods movement operations that would create jobs locally. This planning study has been conducted by CCTA and a technical consulting team, led by Parsons (collectively, the Study Team).

Figure ES-1 TriLink Corridor Elements



Visioning and Outreach

Two visioning sessions were held with agency stakeholders for the TriLink (SR 239) study. The TriLink study focused on five key areas that were identified by agency stakeholders during the visioning process:

- Regional Connectivity
- Planned Development and Job Realization
- Roadway Safety
- Emergency Response
- Goods Movement

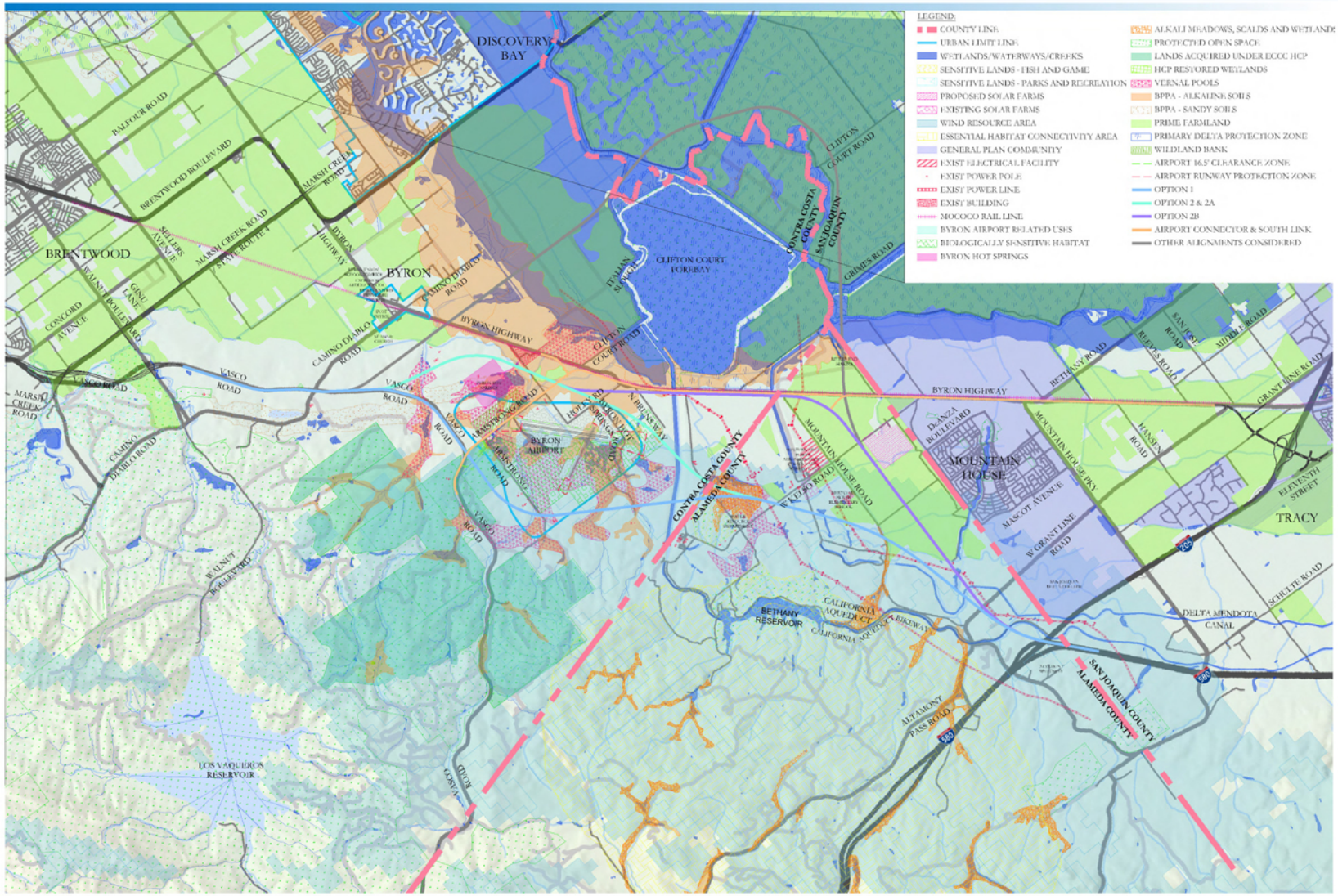
The Study Team, in partnership with the stakeholders and constituents along the corridor, worked to address these five key areas by developing a range of multimodal alignments with the ultimate objective of establishing consensus on the proposed corridor alignments. This was accomplished through a robust public outreach process including a Technical Advisory Committee (TAC), a Non-Governmental Organizations Committee (NGO), a Policy Advisory Committee (PAC), an Executive Steering Committee (ESC), a virtual workshop, general public open houses, and council presentations.

Seven meeting series were completed over an 18-month period with these stakeholder groups. The first meeting series served to introduce the study, while the subsequent meeting series were focused on the various components of the feasibility study.

Corridor Considerations

All of the TriLink study alignments were developed to address five key areas (regional connectivity; planned development and job realization; roadway safety; emergency response; and goods movement) identified during the stakeholder outreach process. Alignments that did not address these key areas were dropped from further consideration. A qualitative comparison was then conducted on the alignment options. This comparison examined biological resources, water resources, cultural resources, existing infrastructure, planned infrastructure, construction cost, and right-of-way (ROW) impacts. Alignments were developed to minimize impacts to corridor considerations whenever possible. Figure ES-2 shows the corridor considerations.

Figure ES-2: Corridor Considerations



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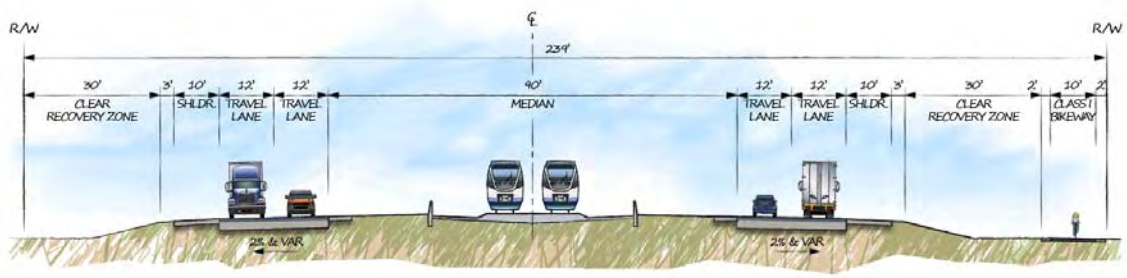
Facility Alignments

Five corridor elements in the TriLink program of improvements were studied as potential connections between Brentwood and Tracy. These five corridor elements include the North Link, Airport Connector, South Link, I-580 Link, and a Transit Link (refer to Figure ES-1). The Airport Connector and South Link would provide improvements to existing infrastructure and support local connectivity and mobility. The North Link and I-580 Link together would comprise a freeway connection between SR 4 and the I-580/I-205 interchange west of Tracy. These elements would facilitate goods movement into, out of, and within the study area, reduce traffic volumes, and provide better access to existing and planned development.

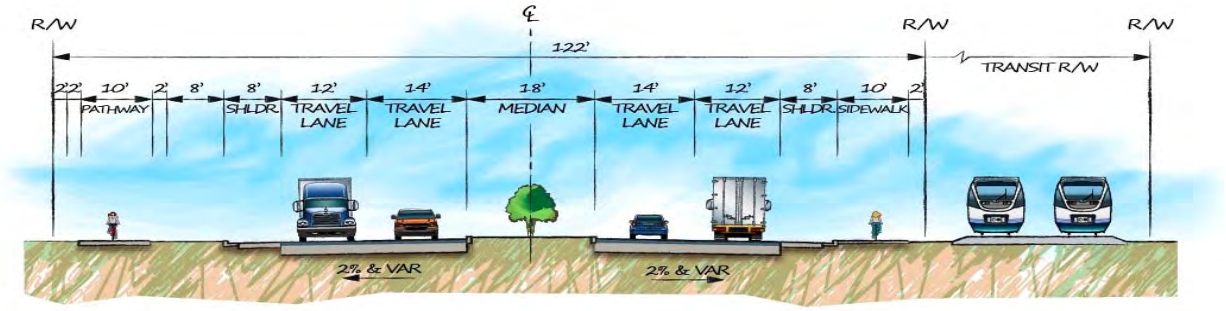
North Link

The proposed North Link is a freeway facility connecting to the planned SR 4 improvements at the Vasco Road and Walnut Boulevard intersection and then connecting to the Airport Connector. The following cross section shows the proposed dimensions for the North Link.



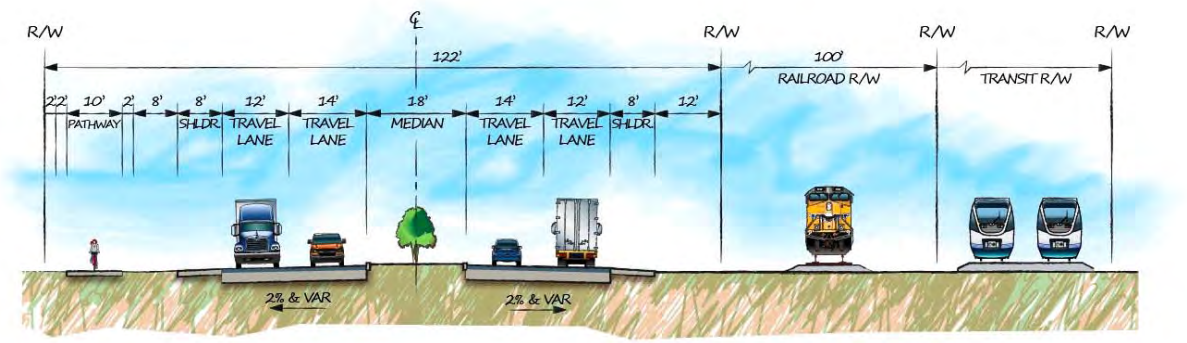
Airport Connector

The proposed Airport Connector is a four-lane major arterial facility that is 2.7 miles long, following the existing alignment of Armstrong Road and extending it westward to connect with Vasco Road. The following cross section shows the proposed dimensions. The Airport Connector would improve the connection between Vasco Road and Byron Highway, as well as improve access to Byron Airport.



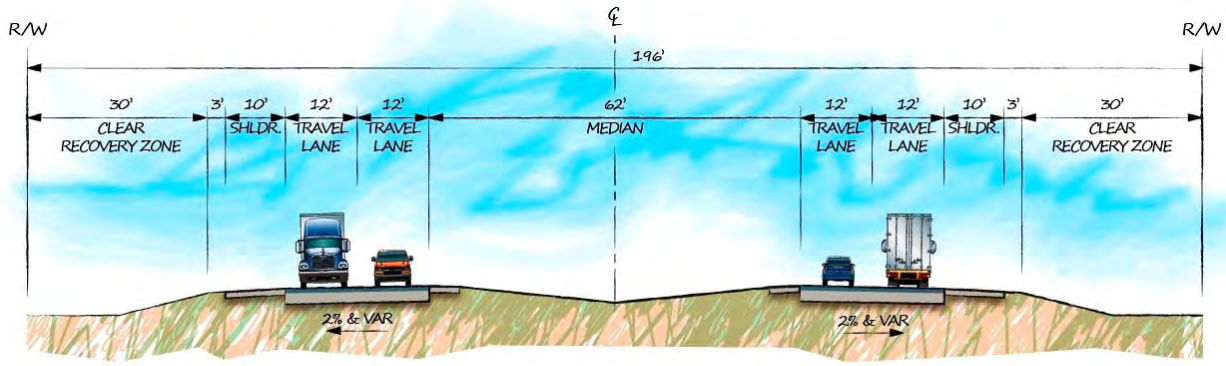
South Link

The proposed South Link is a four-lane major arterial facility that is 7.9 miles long, providing a connection between the Airport Connector, the Mountain House development, and Tracy. The following cross section shows the proposed dimensions. The South Link would run along Byron Highway from the existing at-grade crossing with the Union Pacific Railroad (UPRR) Mococo rail line to the planned I-205/Lammers Road/Eleventh Street interchange in Tracy.



I-580 Link

The proposed I-580 Link is a freeway facility connecting the Airport Connector to the existing I-580/I-205 interchange in eastern Alameda County. The I-580 Link is a continuation of the North Link, continuing the progression of improvements from SR 4 to the North Link and completing the freeway connection through eastern Contra Costa County and eastern Alameda County. The I-580 Link, in conjunction with the North Link, would provide a direct freeway connection from SR 4 and the eastern Contra Costa County communities of Brentwood, Pittsburg, and Antioch to the I-580/I-205 interchange, Tracy, and points to the south and east in the San Joaquin Valley. The following cross section shows the proposed dimensions of the I-580 Link.



Transit Link

The Transit Link is anticipated to follow the TriLink alignments, either in provided median space or adjacent to the roadway of the North Link, Airport Connector, and South Link to connect the residential and job hubs of Brentwood, Mountain House, and Tracy. The Transit Link could be provided in one of many forms, including express bus service, bus rapid transit (BRT), East Contra Costa County Bay Area Rapid Transit (eBART), Bay Area Rapid Transit (BART), or an ACE (Altamont Commuter Express) rail line.

Funding and Delivery Strategy

Funding the program of projects identified by the TriLink study will be challenging. With an estimated capital cost of more than $750 million for the TriLink corridor improvements, available county, State, and federal funding amounts represent only a fraction of the total necessary to deliver the program. Furthermore, in the context of the downward trending transportation funding environment, CCTA must weigh the opportunities that current State laws may provide. These opportunities may occur in the form of accelerated project delivery methods and/or innovative financing methods. Such methods may be appropriate for tolling or other private financing mechanisms under public-private partnerships (P3s). The ability to design, build, operate, and maintain the TriLink projects may take years of innovative thinking to achieve the program goals and realize the regional benefits.

Summary of Findings and Next Steps

Four corridor elements and their optional corridor alignments in the TriLink program of improvements were evaluated to determine potential impacts. These corridor elements and optional alignments include the Airport Connector, South Link, North Link (Options 1 and 2), I-580 Link (Options 1, 2a, and 2b), and a Transit Link (Options 1, 2, and 3).

The comparison results indicate that the two North Link options would have similar impacts, with some differences in impacts to special-status wildlife species and ROW. The I-580 Link Option 1 shows more impacts to corridor considerations than the I-580 Link Options 2a and 2b. Corridor elements were not evaluated against each other, but alignment options were. This is because the corridor elements are not alternatives to each other but are part of the program of improvements. The potential impacts identified will be evaluated in further detail with the next stage of the study before a preferred alignment option is selected.

The feasibility study demonstrates that TriLink would do the following:

- Reduce traffic volumes on I-580, Vasco Road, and Byron Highway by diverting traffic from these existing roadways
- Support local job growth in manufacturing, wholesale, transportation, and related sectors that depend on quality roadways and connections
- Reduce vehicle miles traveled (VMT), greenhouse gas (GHG) emissions, and air pollution in support of state-wide targets
- Provide an effective alternative truck route for trips to eastern Contra Costa County and the northeast portion of the Bay Area, reducing truck volumes on local roads
- Serve as an evacuation and recovery route, facilitating access to and from regional centers of urbanization
- Improve roadway safety by separating high-speed through traffic from local vehicles

Defining a precise alignment would include the following next steps:

- Prepare a Project Study Report-Project Development Support (PSR-PDS) document to allow the option to use State Transportation Improvement Program (STIP) funding for any or all of the phases (i.e., planning, design and engineering, ROW purchase, and/or construction) needed to implement TriLink
- Recommend a program of improvements in the PSR-PDS for the Route Adoption Study
- Prepare a Route Adoption Report, which requires preparing an environmental document
- Obtain the California Transportation Commission Route Adoption Approval

By taking these next steps, progress can be made toward implementation of the TriLink improvements.

It will be important for CCTA to continue advancing project development activities. Project sponsors who are able to deliver a “shovel-ready” project when new State or federal government funding sources become available are often successful in qualifying for and receiving additional funding. In addition, CCTA can look to secure additional local funding commitments or participate in State and regional discussions relative to new funding initiatives that may emerge. Looking forward, it would be beneficial for CCTA to seek advantageous legislative positioning in ballot-box efforts to increase State funding for local entities or find innovative finance methods that can influence early capital outlay of the TriLink program of projects.

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LIST OF ACRONYMS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACE	Altamont Commuter Express
ADT	Average Daily Traffic
Alameda CTC	Alameda County Transportation Commission
APN	Assessor's Parcel Number
ARRA	American Recovery and Reinvestment Act
ATRI	American Transportation Research Institute
BART	Bay Area Rapid Transit
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
BRT	bus rapid transit
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCIC	Central California Information Center
CCTA	Contra Costa Transportation Authority
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CMA	Congestion Management Agency
CM/GC	Construction Manager/General Contractor
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2	carbon dioxide
County	Contra Costa County
CRHR	California Register of Historic Resources
CSD	Community Services District
CTFA	California Transportation Financing Authority
CVRWQCB	Central Valley Regional Water Quality Control Board
DWR	Department of Water Resources
EACCS	East Alameda County Conservation Strategy
eBART	East Contra Costa County Bay Area Rapid Transit
EBMUD	East Bay Municipal Utility District
ECCC	East Contra Costa County
ECCRFFA	Eastern Contra Costa Regional Fee and Financing Authority
ESC	Executive Steering Committee

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FY	fiscal year
GHG	greenhouse gas
GIS	Geographic Information System
HCP	Habitat Conservation Plan
HDM	Highway Design Manual
HEC-22	Hydraulic Engineering Circular, Number 22
HOT	high-occupancy toll
HOV	high-occupancy vehicle
I-5	Interstate 5
I-205	Interstate 205
I-580	Interstate 580
i-GATE	Innovation for Green Advanced Transportation Excellence
IRRS	Interregional Road System
ITIP	Interregional Transportation Improvement Program
JEPA	Joint Exercise of Powers Agreement
JPA	Joint Powers Authority; Joint Powers Agreement
LED	light-emitting diode
LOS	Level of Service
MAP-21	Moving Ahead for Progress in the 21st Century
MOU	memorandum of understanding
mph	miles per hour
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organizations Committee
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OA	obligation authority
P3	public-private partnership
PAC	Policy Advisory Committee
PA/ED	Project Approval/Environmental Document

PDA	Pre-Development Agreement
PFA	public financing authority
PG&E	Pacific Gas and Electric Company
PSR-PDS	Project Study Report-Project Development Support
RFID	radio-frequency identification
ROW	right-of-way
RPZ	Runway Protection Zone
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users
SB	Senate Bill
SCS	Sustainable Communities Strategies
SJCOG	San Joaquin Council of Governments
SJJPA	San Joaquin Joint Powers Authority
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SR	State Route
STMP	Subregional Transportation Mitigation Program
STAA	Surface Transportation Assistance Act
STIP	State Transportation Improvement Program
SWITRS	Statewide Integrated Traffic Records System
TAC	Technical Advisory Committee
TAZ	traffic analysis zones
TEP	Transportation Expenditure Plan
TIGER	Transportation Investment Generating Economic Recovery
TVTC	Tri Valley Transportation Commission
ULL	urban limit line
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
VHD	vehicle hours of delay
VMT	vehicle miles traveled
WSJC	Western San Joaquin County

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PUBLIC LAW 109–59—AUG. 10, 2005 119 STAT. 1331

Highway Projects
High Priority Projects—Continued

No.	State	Project Description	Amount
1930	CA	Conduct study and construct CA State Route 239 from State Route 4 in Brentwood area to I–205 in Tracy area	$4,000,000

PUBLIC LAW 109–59—AUG. 10, 2005 119 STAT. 1509

Transportation Improvements—Continued

No.	State	Project Description	Amount
464.	CA	Construction of and improvements to State Route 239 from State Route 4 in Brentwood area to I–205 in the area of Tracy	$10,000,000

Chapter 1
INTRODUCTION

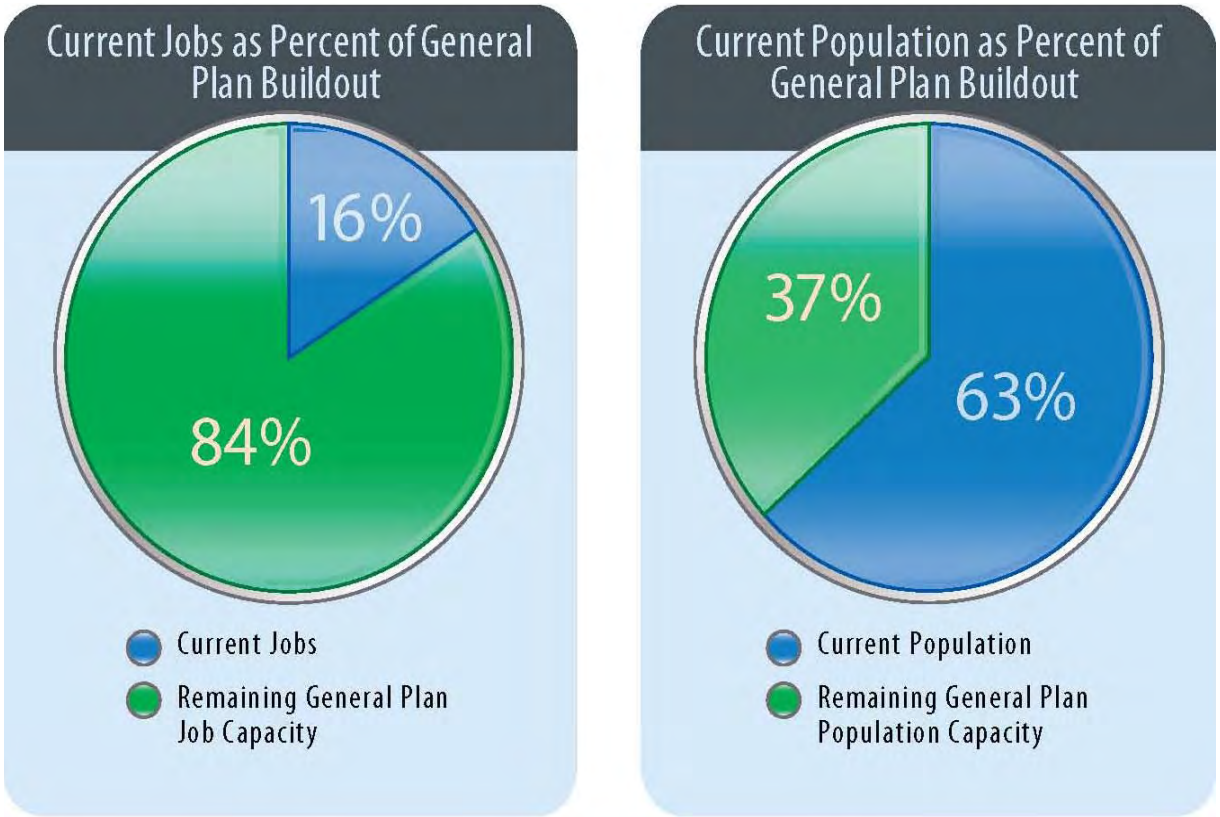
In 2005, Contra Costa County (County) received two federal appropriations totaling $14 million. The federal appropriations were used to establish a multi-jurisdictional partnership that oversaw the process for evaluating multimodal transportation alignments for the TriLink (State Route [SR] 239) corridor. In 2011, the County retained a consultant team, led by Parsons (collectively, the Study Team), to evaluate multimodal transportation alignments in the SR 239 corridor linking SR 4 near Brentwood to Interstate 205 (I-205) or Interstate 580 (I-580) west of Tracy in San Joaquin County, see Figure 1.0-1. In 2012, the County and the Contra Costa Transportation Authority (CCTA) entered into an agreement transferring study responsibility to CCTA.

SR 239 is a legislatively adopted but unconstructed route in the California State Highway System. First identified in 1959, the legislative language describes SR 239 as a potential roadway linking SR 4 near Brentwood to I-205 or I-580 west of Tracy in San Joaquin County. The route was never constructed; however, a California Department of Transportation (Caltrans) Route Concept Report completed in 1985 recommended a two-lane conventional highway with adequate right-of-way (ROW) to handle up to a four-lane facility to serve the high-growth areas (Caltrans, 1985).

The high-growth areas considered in this study include two separate subregions: East Contra Costa County, which consists of Pittsburg, Antioch, Brentwood, and Oakley; and Western San Joaquin County, which consists of Tracy and Mountain House. These two subregions have capacity for more than 500,000 people and nearly 400,000 jobs, according to designations in the communities' planning documents. Sixty-three (63) percent of the General Plan population capacity in these subregions was built-out by the 2010 Census, and all but Mountain House has already achieved more than half of its planned population growth. Only 16 percent of the General Plan job capacity was realized at the time of the 2010 Census, indicating that there is ample room for jobs, see Figure 1.0-2. These data clearly demonstrate that these communities have planned for significant employment, as well as residential development, but they have experienced more residential than job growth.

Figure 1.0-1: Study Area

Figure 1.0-2 Study Area Growth Potential



This study evaluated the feasibility of multimodal alignments developed based on the corridor elements identified during the study's visioning sessions. These multimodal alignments would provide a connection between the two subregions. The feasibility of these alignments was assessed with regards to transportation, economic, environmental, social, and financial performance considerations. This was done by evaluating a range of potential alignment options and design options using technical analysis methods and an extensive public outreach process. Finally, the study considered institutional and regulatory matters that would need to be addressed and potential implementation scenarios.

This introductory chapter reviews the local priorities, regional goals, and context for the study, including a review of existing conditions and analysis of a new multimodal connection. The chapter concludes with a discussion of the growth challenges of the two subregions and a brief description of the organization of the report's chapters.

1.1 Local Priorities and Regional Goals

The TriLink study focused on five key areas that were identified during the stakeholder outreach process:

- Regional Connectivity
- Planned Development and Job Realization
- Roadway Safety
- Emergency Response
- Goods Movement

The Study Team, in partnership with the stakeholders and constituents along the corridor, worked to address the issues and needs associated with each of these areas by developing a range of multimodal alignments with the ultimate objective of establishing consensus on the proposed corridor alignments. This was accomplished through a robust stakeholder outreach process, including a Technical Advisory Committee (TAC), a Non-Governmental Organizations Committee (NGO), a Policy Advisory Committee (PAC), an Executive Steering Committee (ESC), general public workshops, and council presentations.

1.2 Defining the Issues

1.2.1 Regional Connectivity

East Contra Costa County has inadequate roadway connections to the east of Antioch, north, and south. Better connections exist to the west of Antioch due to SR 4 improvements and the planning for the East Contra Costa County Bay Area Rapid Transit (eBART). West San Joaquin County also has better access to roadway connections with Interstate 5 (I-5) to the north, I-205 to the east, and I-580 to the south and west, see Figure 1.2-1.

The few available roadway connections between western San Joaquin County and eastern Contra Costa County lack capacity, multimodal options, and a direct connection. SR 4 (former SR 4 Bypass) north of Marsh Creek Road is planned to be widened to four lanes; however, SR 4 along Marsh Creek Road is not being improved and does not provide sufficient service to the east beyond Brentwood. While Vasco Road has had recent safety improvements, these have not expanded its overall capacity due to the Gateway policy in place.[1] Congestion is also an issue along Vasco Road. Average daily traffic (ADT) has increased by more than 40 percent between 1996 and 2006, and it is expected to continue to increase (Metropolitan

[1] Vasco Road is constrained by Policy 177 in Alameda County's East County Area Plan, which restricts widening.

Transportation Commission, 2008). Additionally, Byron Highway carries approximately 9,000 vehicles per day, with 23 percent truck traffic.

The lack of transportation capacity in eastern Contra Costa County was noted in a 1997 Caltrans study of SR 4, which stated

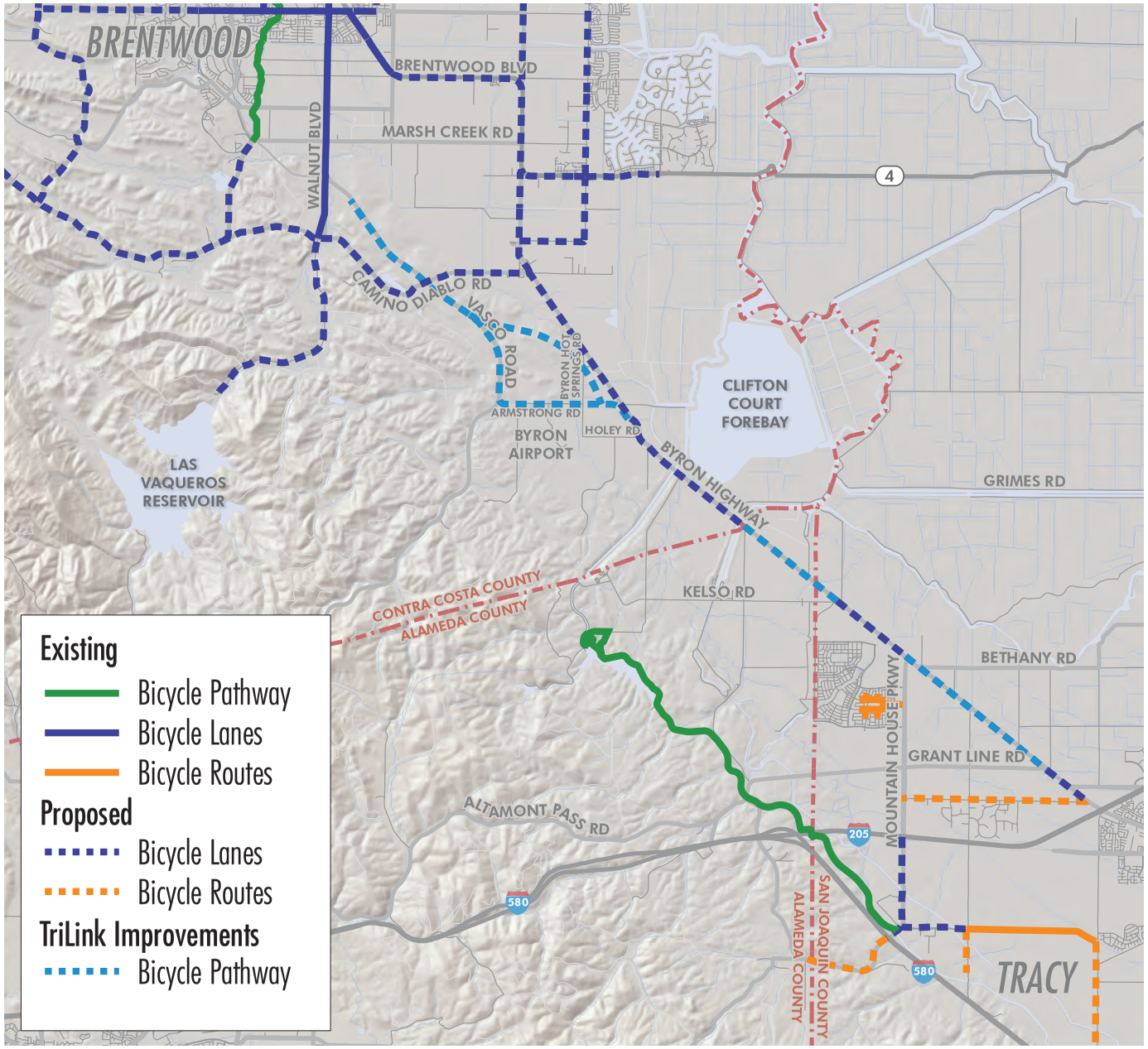
> *Route 4 is intended to connect the Bay Area with Stockton and the Sierra. Due to geometric constraints in the San Joaquin Delta, however, it cannot adequately serve this function. Route 4, therefore, serves as a "cul-de-sac" linking Eastern Contra Costa to the Bay Area but not providing for appreciable interregional movement. Analysis needs to be taken which identifies the facility needs in the 239/Byron Highway Corridor. (Caltrans, 1997)*

Transit, pedestrian, and bicycle connections are also limited in this corridor. The proposed eBART connection stops in Brentwood, but there is no proposed commuter rail connection to western San Joaquin County. Sidewalk and pedestrian paths are missing on some segments, and bicycle lanes also do not extend outside of Brentwood or north of Tracy, as shown in Figure 1.2-2.

The TriLink study presented an opportunity to address access issues for the East County communities of Brentwood, Oakley, Antioch, Byron, and Discovery Bay, long considered a cul-de-sac in terms of highway access because further connections to the east and south are constrained or altogether lacking. TriLink proposed public transit and bicycle connections in the area, and by providing an alternate route for traffic moving from the Tracy area and points farther east and south, TriLink could reduce traffic on I-580. The TriLink study analyzed ways to improve the movement of people and goods within East County and to and from the Tri-County region.

Figure 1.2-1: Existing Regional Connections

Figure 1.2-2: Existing and Proposed Bicycle Facilities



1.2.2 Planned Development and Job Realization

Development in the study area is constrained by growth policies, such as the urban limit line (ULL)[2] in the three counties, Measure D in Alameda County[3], Alameda County's Gateway Policy in the East County Area Plan[4], and environmental and physical planning considerations, as shown in Figure 1.2-3. The TriLink study explored opportunities for access improvements for pedestrians, bicycles, auto, truck, and transit that are supportive of and facilitate planned growth in the study area.

Brentwood, Oakley, Antioch, and the unincorporated area around the Byron airport, all of which are located in eastern Contra Costa County, have undeveloped, non-agricultural lands that are within the voter-approved ULL. These undeveloped lands are designated for commercial, industrial, or business park development. In addition, the Innovation for Green Advanced Transportation Excellence (i-GATE) initiative, centered at the Lawrence Livermore and Sandia labs, aims to create 5,000 new jobs in the Tri-Valley region over the next 5 years. Cordes Ranch, in Tracy, aims to create 23,000 jobs at build-out, while Mountain House in San Joaquin County aims to create 19,843 jobs at build-out.

Improved linkages to the east and south would allow the study area communities to realize current general and specific plans and support new plans to improve the jobs/housing balance, which is approximately 0.5 jobs per household.[5] In particular, industrial development, which is likely to include warehouse development, would be better supported by improved throughput of goods movement in and out of the area, in addition to providing access for employees. These areas are planned for job-generating uses, such as industrial, office, retail space, and business parks, which would provide opportunities for much-needed employment growth in an area that currently has far more employed residents and jobseekers than jobs.

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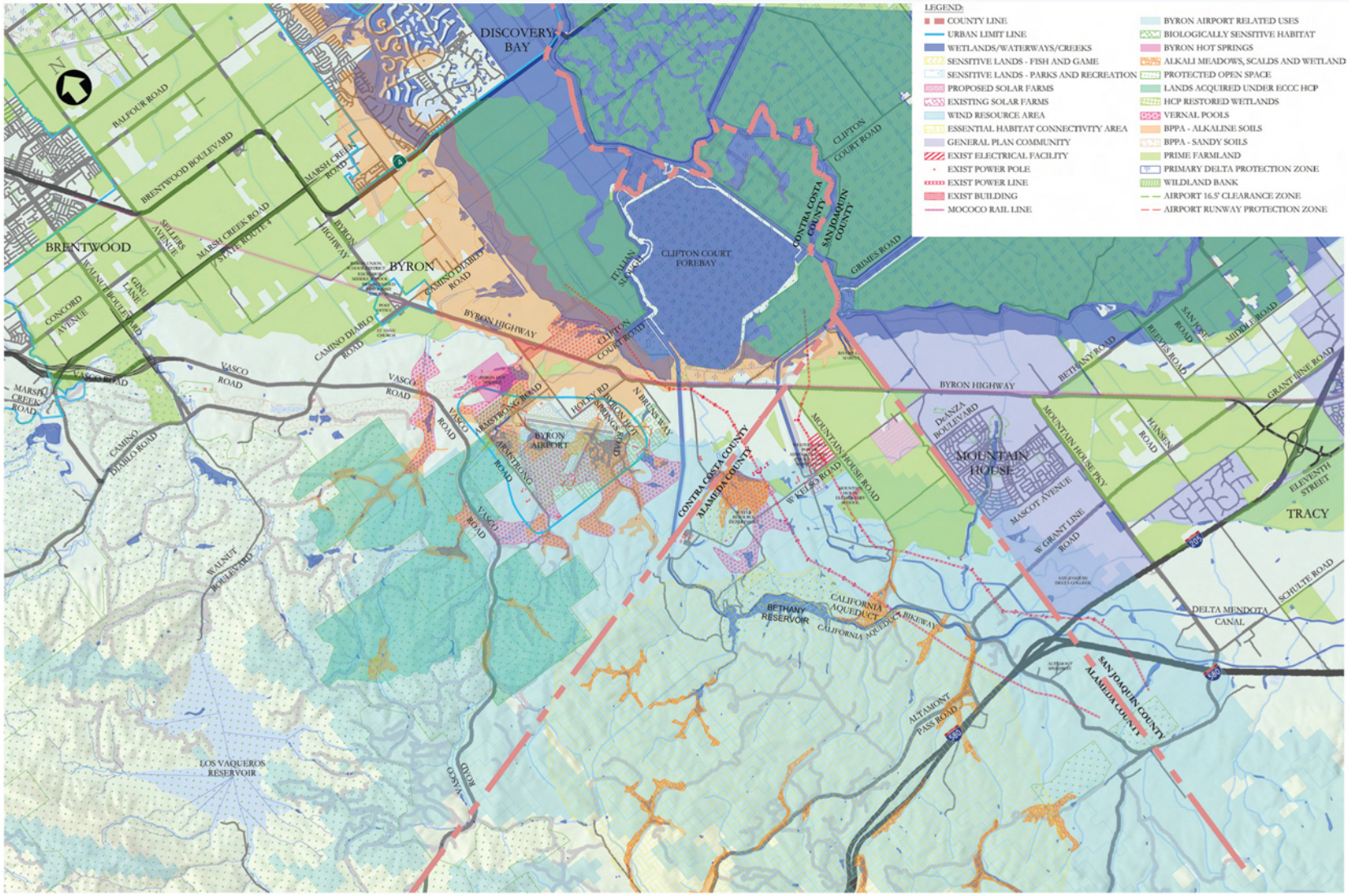
[2] A ULL, urban growth boundary, or other equivalent physical boundary identifies the physical limits of future urban development within a local jurisdiction's planning area.

[3] Measure D, adopted in 2000 and incorporated into the Alameda County General Plan and the East County Area Plan, is primarily a growth control ordinance that focuses growth within the County's Urban Growth Boundary by restricting development potential outside the boundary.

[4] Policy 177: The County shall assign priority in funding decisions to arterial and transit improvements that would improve local circulation and to improvements that would facilitate movement of commercial goods. 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 this plan. This policy shall not preclude the County from supporting or approving any rail projects or improvements required for roadway safety.

[5] A jobs/housing balance of less than approximately 1.5 indicates a net out-commute, so the local ratio of 0.5 jobs per household suggests that many area residents commute to jobs outside their communities.

Figure 1.2-3: Planning Considerations



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In addition to the planned commercial, industrial, and business park development, Tracy, Brentwood, Oakley, and Antioch all have significant areas planned for residential development that have not yet been developed. Improved linkages to the east and south would allow the study area communities to realize general and specific plan potential and to support improvement of the jobs/housing balance. The study explored the impacts of an improved jobs/housing balance on average commute distances, reducing vehicle miles traveled (VMT) relative to the traditional growth patterns, and furthering the aims of regional planning initiatives such as Senate Bill (SB) 375.[6]

1.2.3 Roadway Safety

A study commissioned by Contra Costa County in 2004 reported 254 collisions, including 7 fatal collisions, on Vasco Road between 1996 and 2003. Recent safety improvements on Vasco Road were aimed at addressing this situation, but they did not increase capacity. Sharp curves, narrow lanes, steep grades, lack of passing options, and high traffic volumes mean safety is still an ongoing concern for Vasco Road and other local rural roadways. Between 2008 and 2010, there were 59 collisions on Vasco Road, including 3 fatal collisions. The lack of pedestrian and bicycle facilities along the corridor also poses a safety concern. The same combination of design features that do not meet current standards on Vasco Road also creates safety concerns on Byron Highway. Between 2008 and 2010, there were 22 collisions on Byron Highway (SWITRS, 2010).

The TriLink study examined opportunities for eliminating deficiencies by implementing current design standards, which demonstrate safety benefits, and for rerouting potential future truck traffic to roadways built to a more appropriate design speed to address safety concerns in the study area.

1.2.4 Emergency Response and Recovery

Flooding due to heavy rain events and/or levee failure poses a significant threat to public safety. As discussed in the Contra Costa County Hazard Mitigation Plan Update (Contra Costa County, 2011), such an event would result in the need to evacuate large numbers of people who live in the low-lying areas in and around the Delta. Additionally, increased storm frequency, intensity, and duration could represent a barrier to emergency response and recovery in the short- and long-term time frames. Particularly flood-prone areas within the

[6] SB 375 was signed into law by former Governor Schwarzenegger on September 30, 2008. The bill changes the regional transportation planning process “to achieve, if there is a feasible way to do so,” greenhouse gas (GHG) emission targets set by the California Air Resources Board (CARB). The intent of the bill is to help forestall climate change through the comprehensive integration of land use and transportation planning.

immediate vicinity of the proposed SR 239 corridor include Mountain House, Knightsen, Discovery Bay, Oakley, and Antioch. Flooding in any of these areas would result in an immediate need to evacuate to the south and would likely preclude evacuation to the east.

The TriLink facility could serve as an evacuation route, facilitating access to and from regional centers of urbanization.

1.2.5 Goods Movement

In the future, manufacturing, wholesale, and transportation are expected to be among the fastest growing industries in the east Contra Costa and west San Joaquin region. Today, the Tracy area and nearby Lathrop are key regional trucking and intermodal distribution centers for the Bay Area, and trucks from these centers bound for east Contra Costa County use Byron Highway because it is the shortest route. In addition, there are significant agricultural resources around the south and southeast of Byron that use Byron Highway for distribution access.

The lack of an effective connection between west San Joaquin County and east Contra Costa County will affect the efficient movement of freight as freight volumes and traffic congestion increase. Vasco Road is currently at or near its capacity, while Byron Highway and SR 4 are at approximately 70 percent of their capacity. Preliminary traffic growth demand estimates show that, by 2040, current capacity within the corridor will be exceeded by 150 percent or more.

A key focus of the TriLink study involved an analysis of goods movement in the region, now and in the future. The analysis indicated that efficient trucking routes will likely be critical for the economic development of the region, because rail freight movement is only cost effective for longer distances (i.e., 300 to 500 miles). The TriLink study also examined potential synergies with the recently opened California Green Trade Corridor/Marine Highway project, which is now providing freight services, via barge, between the Port of Oakland and California's only two inland river ports in Stockton and Sacramento.

1.3 Report Organization

This report summarizes technical analyses and public outreach activities, and it identifies potential implementation scenarios for advancing the TriLink corridor elements. The remaining chapters are organized as follows:

- Chapter 2 (Outreach and Feedback) documents the outreach strategy with the various stakeholder groups and the input received.

- Chapter 3 (Land Use and Traffic Analysis) provides an overview of the modeling approach, network and land use assumptions, and traffic forecasts.
- Chapter 4 (Sustainability and Resources Stewardship) discusses the green design principles approach, describes the Envision Rating System, and potential green uses of the corridor.
- Chapter 5 (Environmental Considerations and the Built Environment) documents the environmental resources considered, potential impacts, and mitigation measures.
- Chapter 6 (Corridor Elements) documents the corridor elements evaluated, design standards, planning constraints, and the financial performance of the corridor elements.
- Chapter 7 (Evaluation of Corridor Elements) documents the options compared and presents the results.
- Chapter 8 (Proposed Implementation Scenarios) provides guidance for successful implementation of the corridor elements by highlighting major milestones required for route adoption, funding, and delivery methods.
- Chapter 9 (Conclusions) summarizes the findings and recommendations developed during the study process.

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Chapter 2
Outreach and Feedback

Two visioning sessions were held for the TriLink (SR 239) study. During the visioning sessions, the following items were discussed and/or defined:

- Problem Definition
- Key Objectives
- Stakeholder Outreach Plan
- Potential Corridors
- Facility Type
- Potential Fatal Flaws

The Study Team worked to incorporate these items into a draft Study Impetus, which was updated throughout the process leading up to project initiation.

Two preliminary briefings were held with key public officials and NGOs in September 2011 to receive initial feedback from stakeholders regarding issues and opportunities to consider as part of the TriLink Study. Approximately 15 key elected officials and staff representatives and five representatives from NGOs attended, as shown in Table 2.0-1. Participants heard a presentation providing a project overview and summarizing key project tasks, including a financial screening study, vision statement, project web site, and key stakeholder group briefings. Participants then made comments and asked questions during a question and answer period.

Table 2.0-1 Project Briefing Participants

Government Agency Representatives **September 7, 2011**
Brian Hooker, Senior Field Representative for John Garamendi, U.S. Representatives, California District 10
Gary Prost, Caseworker for Jerry McNerney, U.S. Representative, California District 11
Kul Sharma, City Engineer, City of Tracy
Kenneth Kao, Metropolitan Transportation Commission, Programming and Allocations
Nader Shareghi, Public Works Director, Mountain House Community Services District
Linnea Juarez, Chair, Byron Municipal Advisory Committee
Beth Lee, Assistant Director of Airports, Contra Costa County
Bailey Grewal, City Engineer from Mayor's office, City of Brentwood
Mike Selling, Deputy Director, Engineering, San Joaquin Public Works Department, on behalf of San Joaquin County, Board of Supervisors, District 5
Mike Swearingen, Senior Regional Planner, San Joaquin Council of Governments
Dawn Argula, Chief of Staff for Scott Haggerty, Alameda County, Board of Supervisors, District 1
Mark Green, Chair, Alameda County Transportation Commission
Iris Obregon, Senior Field Representative for Joan Buchanan, California State Assembly, District 15 Representative
Mark Herbert, District Director for Susan Bonilla, California State Assembly, District 11 Representative
Lisa Chow, Executive Assistant for Mark DeSaulnier, California State Senate, 7th District
Non-Governmental Organization Representatives **September 8, 2011**
Matt Williams, Sierra Club
Ron Brown, Save Mount Diablo
Linda Best, Contra Costa Council
John Kopchik, East Contra Costa County Habitat Conservancy
Laura Baker, California Native Plant Society

The Study Team developed an outreach strategy that consisted of a seven-meeting series with the following stakeholder groups that would be directly involved in the study:

- PAC – Composed of elected officials from the communities and jurisdictions along the potential alignments.
- ESC – Composed of a chief of staff and/or senior manager from each of the jurisdictions on the PAC and CCTA.

- TAC – Composed of key technical staff from the three counties, CCTA, transit agencies, local legislators' offices, and the cities and Community Services Districts (CSDs) represented on the PAC. See Table 2.0-2 for a list of the TAC representatives.
- NGO Stakeholder Committee – Composed of leaders from key non-governmental stakeholder organizations whose input will be important to move the project forward. See Table 2.0-3 for the list of organizations.
- General Public – At each juncture, participation occurred through three conventional public open house meetings and a "virtual workshop" consisting of PowerPoint presentations and surveys available online.

Table 2.0-2 Technical Advisory Committee (TAC)

Counties	Contra Costa County San Joaquin County Alameda County	
Cities and Communities	City of Brentwood City of Oakley City of Antioch City of Pittsburg	City of Tracy City of Livermore Mountain House CSD Discovery Bay CSD
Public Agencies	Contra Costa Transportation Authority (CCTA) Caltrans TRANSPLAN Tri Valley Transportation Commission (TVTC) San Joaquin Council of Governments (SJCOG) Altamont Commuter Express (ACE) Alameda County Transportation Commission (Alameda CTC) Delta Protection Commission TRACER Tri Delta Transit Bay Area Rapid Transit (BART)	

Table 2.0-3 Non-Governmental Organizations (NGOs)

Brentwood Agricultural Land Trust	East Bay Bicycle Coalition
Brentwood Chamber of Commerce	East Bay Economic Development Alliance
Building Industry Association	Friends of Livermore
California Alliance for Jobs	Greenbelt Alliance
California Native Plant Society	Oakley Chamber of Commerce
California Trucking Association	Save Mount Diablo
East Bay Leadership Council	Sierra Club
Contra Costa Farm Bureau	Transform

At the suggestion of PAC members, presentations were made to the following bodies to brief decision makers and allow comments and questions from the general public:

- Presentations to Pittsburg, Antioch, Oakley, Brentwood, Tracy, and Livermore city councils
- Presentation to the TRANSPLAN[7] Committee
- Presentations to the boards of directors of CCTA, Alameda County Transportation Commission (Alameda CTC), and San Joaquin Council of Governments (SJCOG)

2.1 Stakeholder Outreach

The first meeting series served to introduce the study and initiate the stakeholder involvement process. The subsequent meeting series were focused on the various components of the feasibility study, as described below.

Each meeting series involved individual meetings with the stakeholder groups needed at that particular point in the process. Not all stakeholder groups met in each meeting series. For example, the TAC and the NGO Stakeholder committees – the working-level stakeholder groups – generally met in each meeting series; however, meetings with the PAC and ESC were only held at the outset and the culmination of the process to review and approve decisions reached at the working group level. The general public was involved after the initial work was done by the working-level stakeholder groups and the consultant team.

[7] The TRANSPLAN Committee coordinates the regional transportation interests of the communities in eastern Contra Costa County.

The stakeholder involvement process was completed over a period of approximately 18 months and resulted in a publicly vetted TriLink Feasibility Study Draft Final Report. Each meeting series is described in Table 2.1-1. The individual meetings within each series are listed in the order in which they occurred.

Table 2.1-1 Meeting Series Summary

Meeting Series One: Project Kickoff	
Time Frame	May 2012
Stakeholders Involved	TAC NGO Stakeholder Committee ESC PAC
Purpose	Kickoff the stakeholder involvement process with an introduction to the study and an introduction to the study impacts and context.
Meeting Series Two: Study Impetus Statement and Preliminary Corridors	
Time Frame	July 2012
Stakeholders Involved	NGO Stakeholder Committee TAC
Purpose	Review the study impetus statement and examine issues around potential alignments in greater detail.
Meeting Series Three: Planning Context	
Time Frame	September 2012
Stakeholders Involved	NGO Stakeholder Committee TAC
Purpose	Present job and housing predictions and preliminary traffic growth forecasts developed for the study, and receive stakeholder feedback.
Meeting Series Four: Develop Corridor Elements	
Time Frame	December 2012
Stakeholders Involved	NGO Stakeholder Committee TAC
Purpose	Present preliminary study alignment and cost estimates, and receive comments from stakeholders.

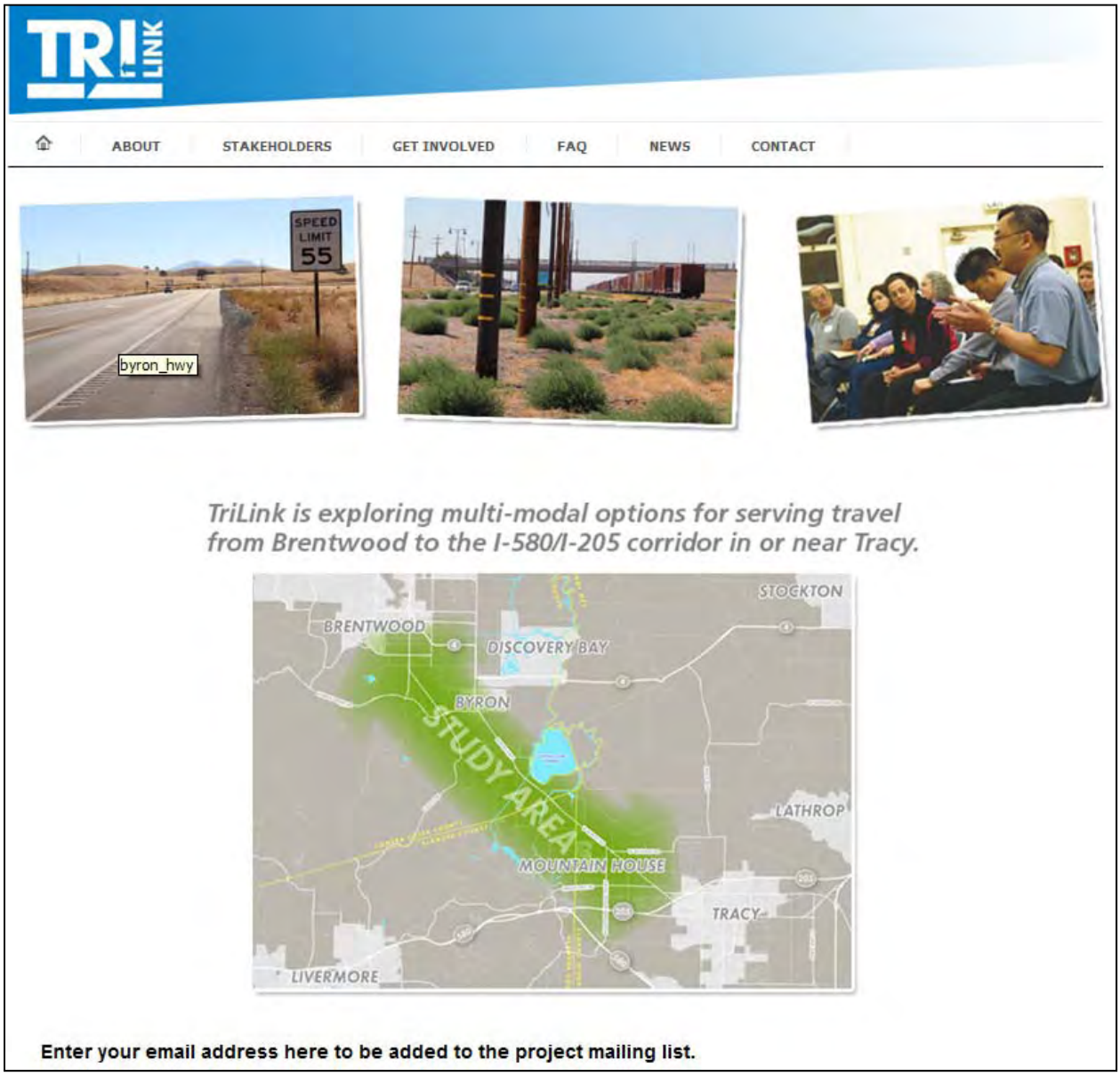
Table 2.1-1 Meeting Series Summary

Meeting Series Five: Review Corridor Elements	
Time Frame	March 2013
Stakeholders Involved	ESC NGO Stakeholder Committee PAC
Purpose	Review materials developed in consultation with TAC and NGO stakeholder committees in 2012. Present revised study alignments updated based on stakeholder feedback received on December 11, 2012. Request that the Policy Advisory Committee approve • Posting the TriLink study information on the TriLink web site; • Developing a more detailed feasibility study of the corridor elements; and • Initiating a series of public meetings.
Meeting Series Six: Goods Movement Analysis, VMT Modeling, and Implementation and Funding Scenarios	
Time Frame	July 2013
Stakeholders Involved	TAC NGO Stakeholder Committee
Purpose	Review the results of the goods movement analysis and VMT/greenhouse gas (GHG) emissions assessment, and run through possible implementation scenarios, obtaining feedback from stakeholders with a review to refining this information for inclusion in the Feasibility Study Draft Report.
Meeting Series Seven: Feasibility Study Draft Final Report	
Time Frame	December 2013
Stakeholders Involved	ESC
Purpose	Recap public and agency comments on the Feasibility Study Draft Report.

2.1.1 Web and Media

To reach out to all segments of the population, web and social media tools were used to publicize the TriLink study. The study web site (www.trilink239.org) was launched in May 2012 and has been updated regularly as new information has become available. The study web site provides an opportunity for individuals to learn about the study and get involved (see Figure 2.1-1).

Figure 2.1-1 TriLink Study Web Site



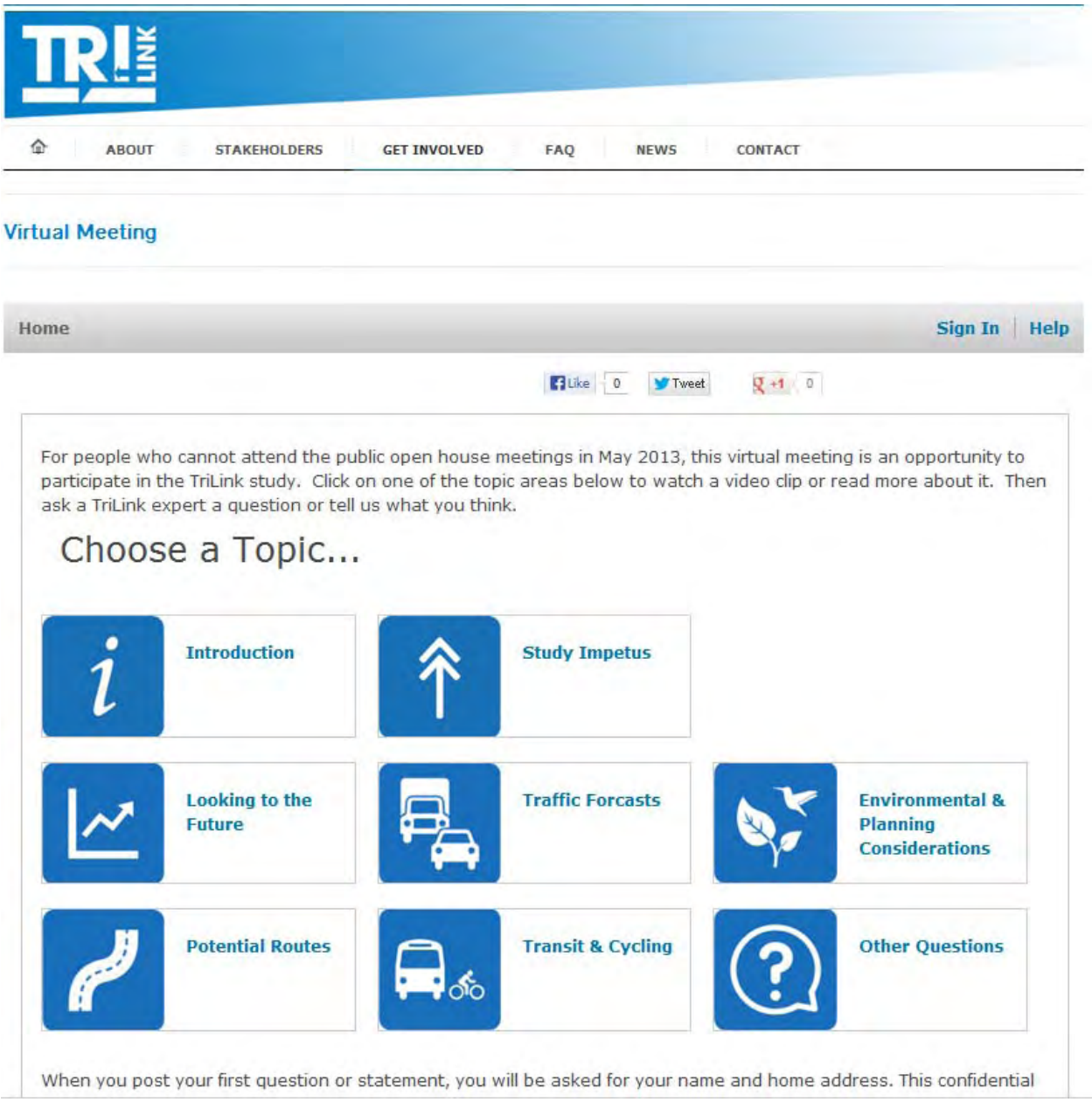
Source: http://trilink239.org/

Social media outreach was also conducted via the City of Tracy Facebook page, Mountain House community Facebook page, MHvillages online community forum, Livermore Patch online chat boards, and Alameda County Board of Supervisors District 1 social media sites. In addition, e-mails were sent to a list of study area communities and people who registered via the web site to let them know about the study and the public open house meetings. Tri-fold mailers were sent to landowners in the study area ahead of the Livermore public open house meeting. Articles were published in the *Contra Costa Times, Brentwood Press,* and *Antioch Herald,* and advertisements were placed in the *Livermore Independent, Pleasanton Weekly,* and *Tri-Valley Times.* Contra Costa television broadcast the Brentwood public meeting on May 14, 2013 at 7:00 p.m., May 15, 2013 at 10:00 a.m., and November 11, 2013 at 8:00 p.m.

2.1.2 Virtual Workshop

Public open house meetings were held in four physical locations, described below in Section 2.4. In parallel to these public open house meetings, a virtual workshop using the Open Town Hall software platform was conducted. This innovative tool is specifically designed to engage people who may not otherwise be able to attend a public open house meeting in person. This interactive forum was embedded in the TriLink web site and allowed interested members of the general public to view maps, presentation materials, and video clips and to provide feedback on their own time (see Figure 2.1-2). Users were required to register before leaving comments, so it was possible to sort and view input by geographic location.

Figure 2.1-2 Virtual Workshop on TriLink Web Site



Source: http://trilink239.org/opentownhall/

2.2 Direct Outreach to Local Agencies

Agency and NGO feedback on the potential alignments was received during the stakeholder meetings described above in Table 2.1-1. Additionally, at the suggestion of ESC members, the Study Team held supplementary meetings with the following agencies to discuss specific issues in greater detail:

- Alameda County Community Development Agency
- City of Tracy Development and Engineering Services
- Contra Costa County Airport Division Offices
- East Contra Costa County Habitat Conservancy
- Mountain House CSD

These agencies provided feedback on a variety of issues. Table 2.2-1 summarizes this feedback and indicates where discussion of these issues can be found in this report.

Table 2.2-1 Additional Comments on Potential Alignments

Additional Comment	Relevant Study Component(s)
The East Contra Costa County Habitat Conservation Plan (HCP)/ Natural Community Conservation Plan (NCCP) anticipates that the SR 239 project would consist of the expansion of Byron Highway to a multi-lane freeway somewhere within the 1,500-foot-wide corridor around the existing highway. The HCP/NCCP describes that a new alignment could be constructed between Byron Highway west to the existing railroad tracks, which are approximately 80 feet from the center of the highway, or farther east near the community of Discovery Bay. The HCP/NCCP also includes high-priority conservation areas to the west and south of Byron Airport.	Environmental Considerations and the Built Environment Comparison of Corridor Elements
The I-580 Link Option 2b goes through prime agricultural land and through an area where a proposed solar farm may be located.	Comparison of Corridor Elements
The I-580 Link Option 2b may be growth inducing because it would provide access to areas that would otherwise not be accessible.	Land Use and Traffic Analysis
The I-580 Link Option 2b may drive birds towards the Altamont Pass Wind Resource Area, which may result in higher avian fatality.	Environmental Considerations and the Built Environment
The I-580 Link Option 2b crosses flight paths for birds, and there may be conflicts with vehicles.	Environmental Considerations and the Built Environment
Determine the potential impact of a new roadway on the Gateway policy.	Land Use and Traffic Analysis

Table 2.2-1 Additional Comments on Potential Alignments

Additional Comment	Relevant Study Component(s)
Determine the consistency of the study with Measure D.	Comparison of Corridor Elements
Determine vehicle impacts that may result from the alignments.	Land Use and Traffic Analysis
Determine air quality impacts that may result from the alignments.	Land Use and Traffic Analysis
Determine the potential impacts of increased truck traffic that may result from the I-580 Link.	Land Use and Traffic Analysis
Determine potential impacts of the alignments on wildlife corridors.	Environmental Considerations and the Built Environment
The Byron Highway improvements should tie into the I-205/Lammers Road/Eleventh Street project and Eleventh Street in Tracy.	Corridor Elements
A roadway connection to Vasco Road is a priority for Byron Airport.	Corridor Elements
The Airport Division views Byron Airport as a feeder for planned development and creating a larger job base in the area.	Land Use and Traffic Analysis

2.3 Council and Board Meetings

The Study Team made presentations at 22 council and board meetings of jurisdictions within or adjacent to the study area to obtain feedback on the proposed alignments; see Table 2.3-1.

Table 2.3-1 Council and Board Meetings

Council / Board / Committee	Presentation Dates
Byron Airport Advisory Committee	Thursday, September 12, 2013
Tracy City Council	Tuesday, September 17, 2013
Contra Costa County Board of Supervisors	Tuesday, October 1, 2013
CCTA Planning Committee	Wednesday, October 2, 2013
Discovery Bay CSD Board	Wednesday, October 2, 2013
Alameda County Board of Supervisors Planning & Transportation Committee	Monday, October 7, 2013
Tri-Valley Transportation Commission, Technical Advisory Committee	Monday, October 7, 2013
Brentwood City Council	Tuesday, October 8, 2013

Table 2.3-1 Council and Board Meetings

Council / Board / Committee	Presentation Dates
Mountain House CSD Board	Wednesday, October 9, 2013
San Joaquin Valley Regional Policy Committee	Thursday, October 10, 2013
TRANSPLAN Committee	Thursday, October 10, 2013
CCTA Board	Wednesday, October 16, 2013
CCTA Technical Coordinating Committee	Thursday, October 17, 2013
Tri-Valley Transportation Council	Thursday, October 17, 2013
Byron Municipal Advisory Committee	Thursday, October 17, 2013
Oakley City Council	Tuesday, October 22, 2013
Eastern Contra Costa Transit Authority (Tri Delta)	Wednesday, October 23, 2013
San Joaquin Council of Governments	Thursday, October 24, 2013
East Contra Costa Economic Development Forum	Tuesday, October 29, 2013
San Joaquin County Board of Supervisors	Tuesday, November 5, 2013
Livermore City Council	Monday, November 25, 2013
Discovery Bay Branch Sons in Retirement	Tuesday, January 14, 2014

In general, comments received from these meetings showed strong support for the TriLink improvements.

2.4 Public Open House Meetings

Four public open house meetings were held in May and November 2013, one in each of the following communities: Brentwood, Tracy, Mountain House, and Livermore. The meetings were conducted in an open house format, where work on the TriLink study to date was recapped, including study impetus, traffic demand modeling results, environmental and policy constraints, and potential alignments, and members of the public were invited to visit stations, ask questions, and comment. Meeting materials included a PowerPoint presentation, maps, and boards. Solicitation techniques included a full-group question and answer session. Below is a summary of the public open house meetings that were held:

1. Brentwood Community Center – Thursday, May 2, 2013

   The first public open house meeting, held on Thursday, May 2, 2013, at the Brentwood Community Center, was attended by approximately 17 people representing residents, community organizations, and elected officials.

2. Tracy Transit Center (Room 103/104) – Wednesday, May 8, 2013

   The second public open house meeting, held on Wednesday, May 8, 2013, at the Tracy Transit Center, was attended by approximately eight people representing residents, community organizations, and elected officials.

3. Mountain House CSD Board Room – Thursday, May 16, 2013

   The third public open house meeting, held on Thursday, May 16, 2013, at the Mountain House CSD Board Room, was attended by approximately 13 people representing residents, community organizations, and elected officials.

4. Livermore City Council Chambers – Tuesday, November 12, 2013

   The fourth public open house meeting, held on Tuesday, November 12, 2013, at the Livermore City Council Chambers, was attended by approximately 20 people representing residents, community organizations, and elected officials.

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Chapter 3
Land Use and Traffic Analysis

To evaluate the expected usage of the new facilities, it is important to understand the existing demographic and employment patterns, as well as to forecast future conditions. To accomplish this, the Study Team developed socioeconomic datasets for a "Ten-County Model," incorporating the nine Bay Area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma), as well as San Joaquin County. The "Ten-County Model" is therefore a hybrid of the CCTA Nine-County Model and the SJCOG Model. To enhance the precision of the traffic modeling, these socioeconomic data were provided at a subjurisdictional level called "traffic analysis zones" (TAZs), as shown in Figure 3.0-1. This framework allowed the traffic modeling to account for more specific origins, destinations, and purpose of trips.[8]

This section summarizes the forecasted growth in the study area, the potential traffic impacts, and the benefits of the TriLink improvements.

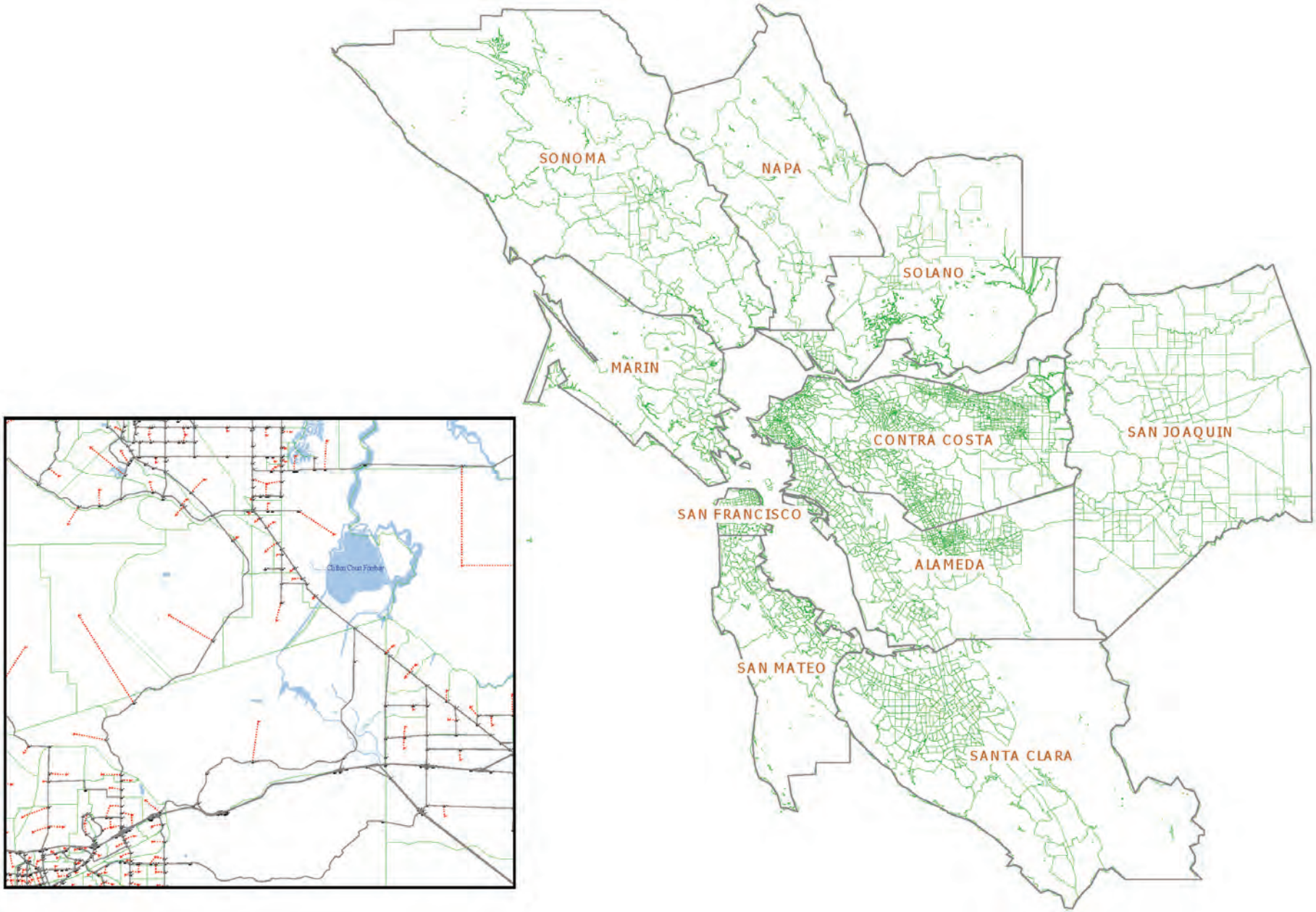
3.1 Forecasting Future Growth in the Study Area

While the modeling was conducted on a ten-county basis, the socioeconomic trends, plans, and growth capacity described in this report focus on the communities that would be most directly affected by the TriLink improvements. These communities are described below:

- East Contra Costa County (ECCC) – Pittsburg, Antioch, Brentwood, and Oakley. Statistical analysis was conducted for Discovery Bay, Bay Point, and the Byron Airport areas, if statistically significant.
- Western San Joaquin County (WSJC) – Tracy and Mountain House

[8] See the "TriLink (SR 239) Transportation Modeling and Traffic Forecasting Methodology Memorandum" (April 2014) for more details on the Ten-County Model.

Figure 3.0-1: CCTA Ten County Model



The most recently adopted regional forecasts were provided in 2009 by the Association of Bay Area Governments (ABAG) and the SJCOG. While both organizations are in the process of updating their growth forecasts to respond to changes in market conditions and legal requirements (i.e., the Sustainable Communities Strategies [SCS][9] required under SB 375 and the San Joaquin General Plan Update), the 2009 figures are the current "forecasts of record" and represent the base data source for the rates and geographic allocation of new household and job growth in the ten-county region. As such, the TriLink socioeconomic forecasting begins with these 2009 forecasts and makes adjustments to 2010 conditions.

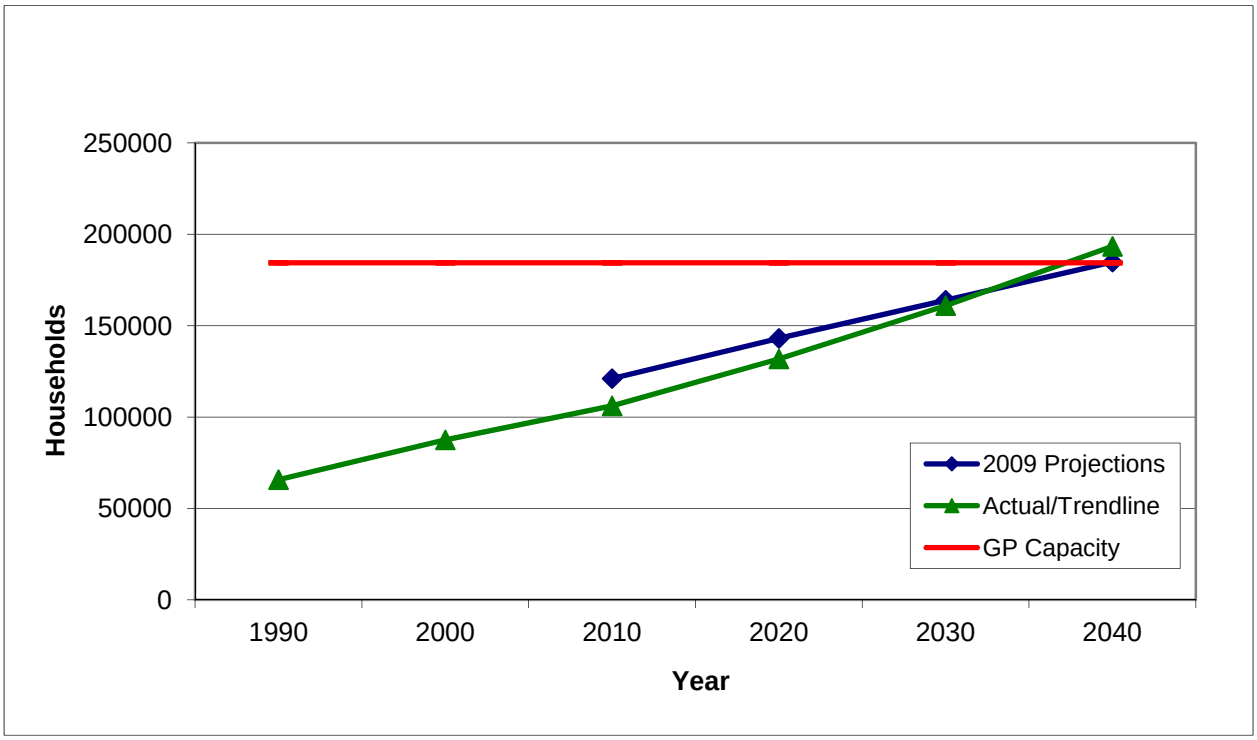
As a consequence of the "Great Recession," ABAG's 2009 forecast never fully materialized for 2010 households and jobs in the ECCC communities, and SJCOG's population and household forecasts for 2010 were also significantly higher than the actual data available through the 2010 decennial census and other available data. [10] Consequently, all of the base year data were reset, and the growth increments from the forecasts of record were applied through 2040 to the adjusted 2010 base. The result was lower absolute job and household figures than was forecasted by the 2009 projections for the end of the 2040 planning horizon, but the same total increment of growth.

As shown in Figure 3.1-1, the 2009 projections from ABAG and SJCOG indicate that all of the communities are likely to realize significant housing growth, similar to the expected growth based on the "Actual/Trendline" data and approaching full residential buildout by 2040. In fact, the 2009 projections suggest that all but 9 percent of the total capacity for housing will be built by 2040.

[9] The Metropolitan Transportation Commission (MTC) and ABAG developed an SCS as part of the 2013 Regional Transportation Plan (RTP). The SCS, together with transportation investments included in the RTP, is intended to achieve the GHG reduction targets set by the California Air Resources Board (CARB) for 2020 and 2040. Sustainability is linked to three goals: economy, environment, and equity, to build a stronger economy, protect the natural environment, and equitably enhance opportunities for all Bay Area residents.

[10] The 2009 projections from SJCOG were used for jobs in WSJC, with the exception of Mountain House, which was adjusted to 2010 conditions. The 2009 SJCOG job projections are within the expected margins of difference from the most recent California Employment Development Department and U.S. Census Bureau figures for that year.

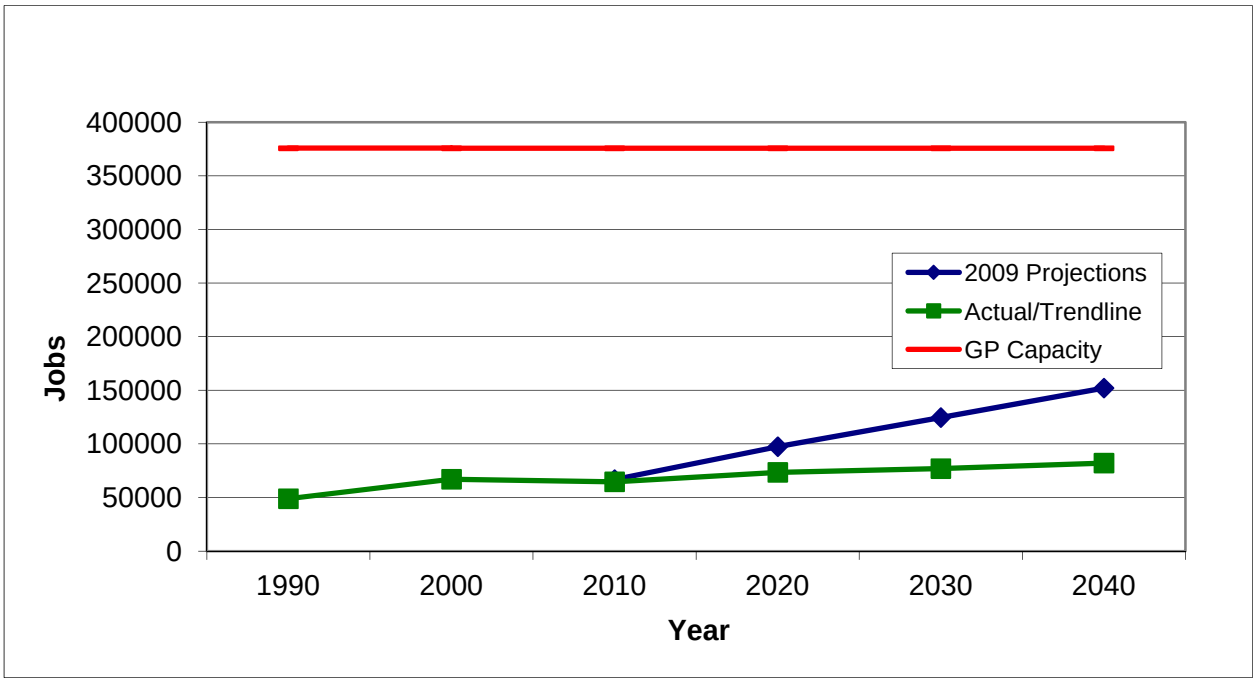
Figure 3.1-1 Study Area Household Projections



Sources: ABAG Projections 2009; SJCOG 2009 Projections; Sword Company; Economic & Planning Systems, Inc.

Historically, job growth in east Contra Costa and western San Joaquin counties has not kept pace with housing. The forecast for jobs varies greatly, as the 2009 projections represent 67 percent more jobs than the “Actual/Trendline” data would suggest; however, total jobs through 2040 are still expected to fall short of the area’s total planned capacity for jobs, as shown in Figure 3.1-2. Local communities have planned for job growth, expecting manufacturing, wholesale, and transportation to be among the fastest growing industries in the region. These industries rely heavily on transportation infrastructure and quality connections that are lacking in the study area. Without "game-changing" improvements to the transportation infrastructure, job growth is likely to occur at a moderate rate, primarily in the service sector, and correlate to increased population, as shown by the Actual/Trendline in Figure 3.1-2.

Figure 3.1-2 Study Area Job Projections



Sources: ABAG Projections 2009; SJCOG 2009 Projections; Sword Company; Economic & Planning Systems, Inc.

All of the general plans of San Joaquin County and the west San Joaquin County communities of Tracy and Mountain House; and the east Contra Costa County communities of Pittsburg, Antioch, Oakley, and Brentwood in the study area were examined for references to SR 239 or similar improvement. In addition, the master plans for Discovery Bay and the Byron Airport were examined. Local general plans for the counties and cities within or adjacent to the study area do not explicitly describe TriLink improvements as necessary to obtain the plans' projected residential or employment growth; however, the commitment to cooperating/collaborating with regional transportation planning included in those plans does, in fact, directly tie them to an expressway route between Brentwood and Tracy. References to SR 239 or similar improvements in the Contra Costa County General Plan are listed below:

- Roadway Network Plan (Figure 3.1-3), shows a Proposed Expressway connecting Vasco Road to a route running parallel to Byron Highway to the county line just north of Tracy. This is the SR 239 route.
- Transit Network Plan (Figure 3.1-4), shows a Transit Corridor linking east Contra Costa County to west San Joaquin County.
- Byron Airport Influence Areas (Figure 3.1-5), shows a roadway link between Vasco Road and Byron Highway.
- A Recommended Development Plan (Figure 3.1-6), in the separately published 2005 Byron Field Airport Master Plan, also shows a link between Vasco Road and Byron Highway.

Figure 3.1-3: Roadway Network Plan

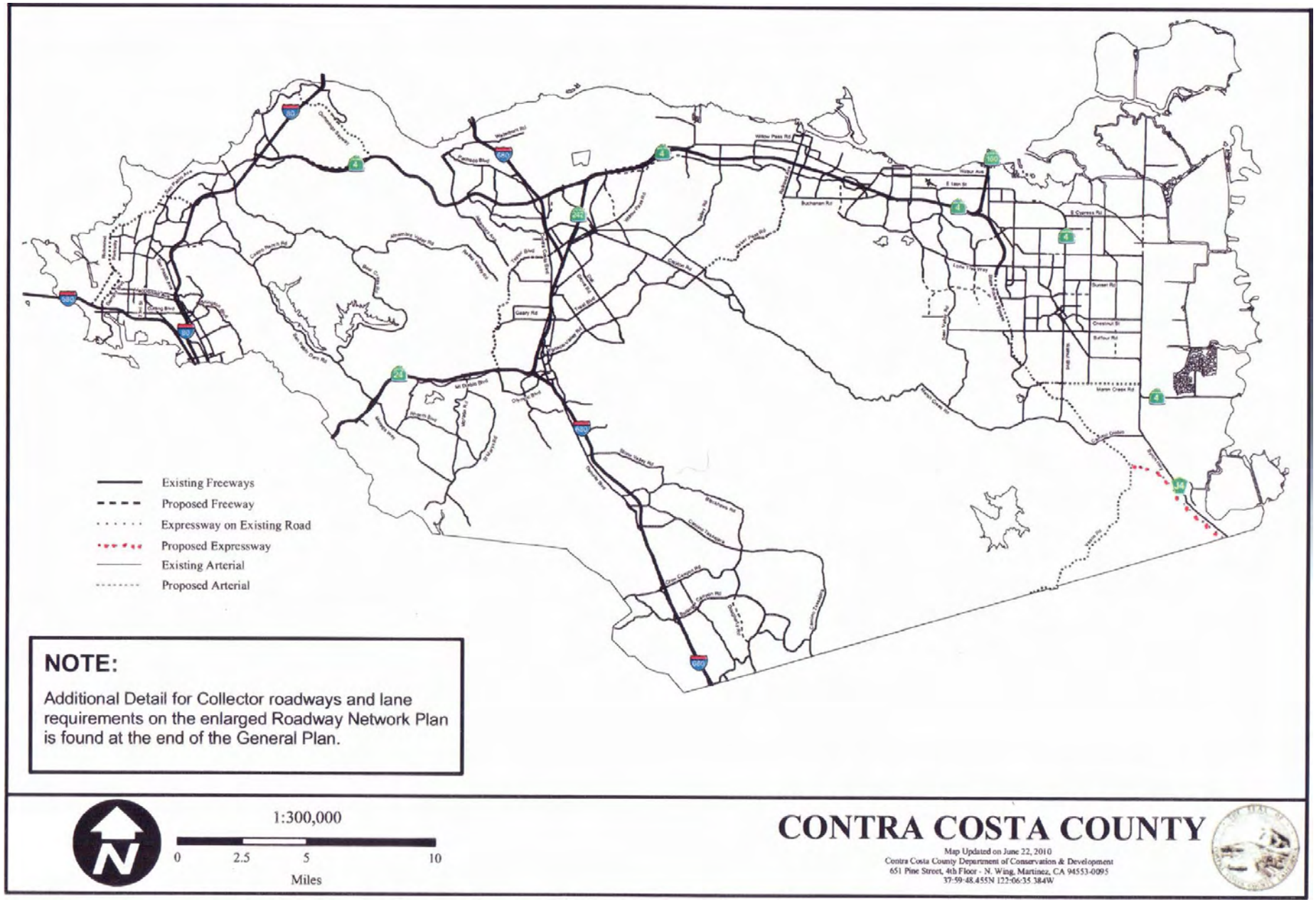


Figure 3.1-4: Transit Network Plan

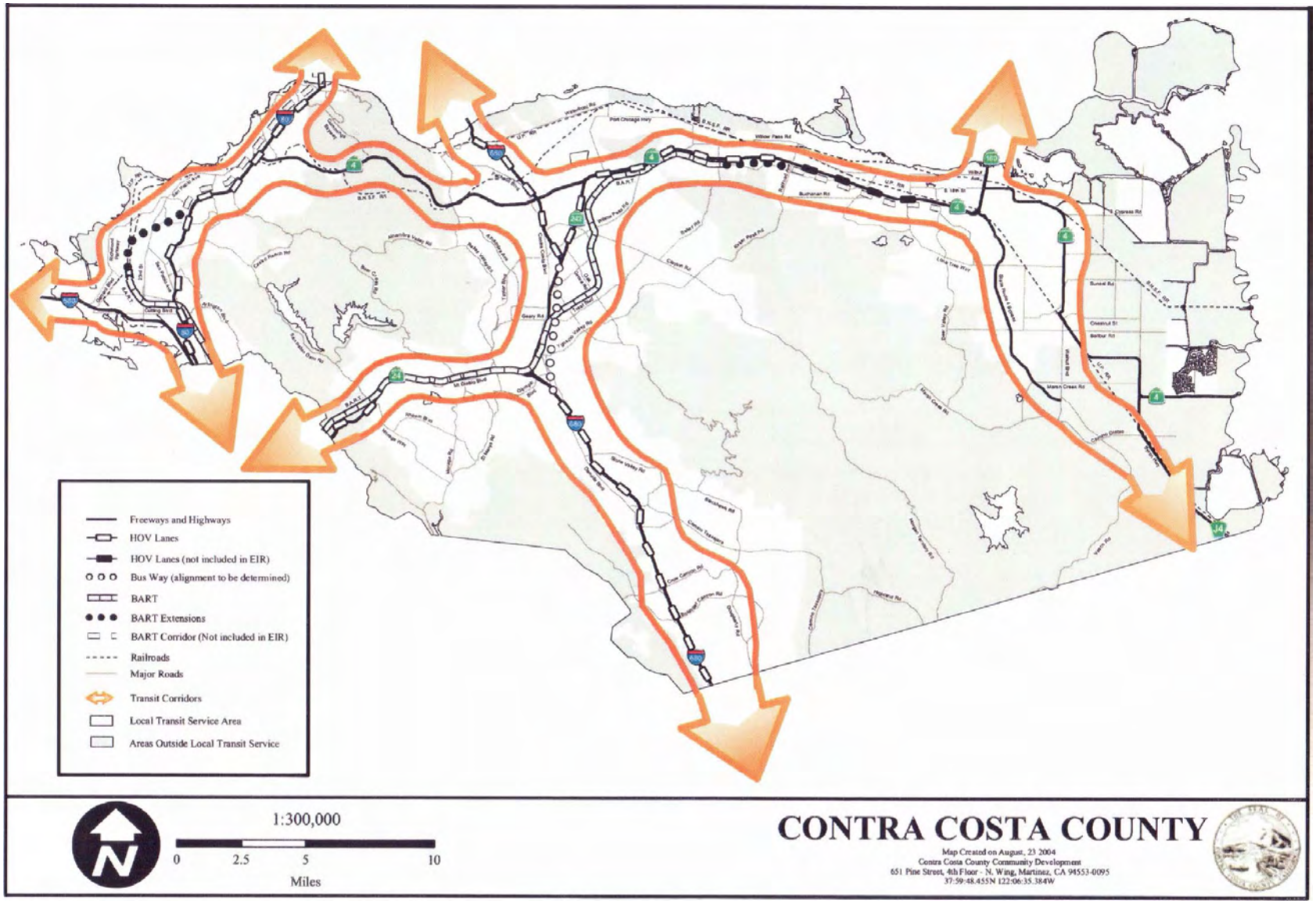


Figure 3.1-5: Byron Airport Influence Area

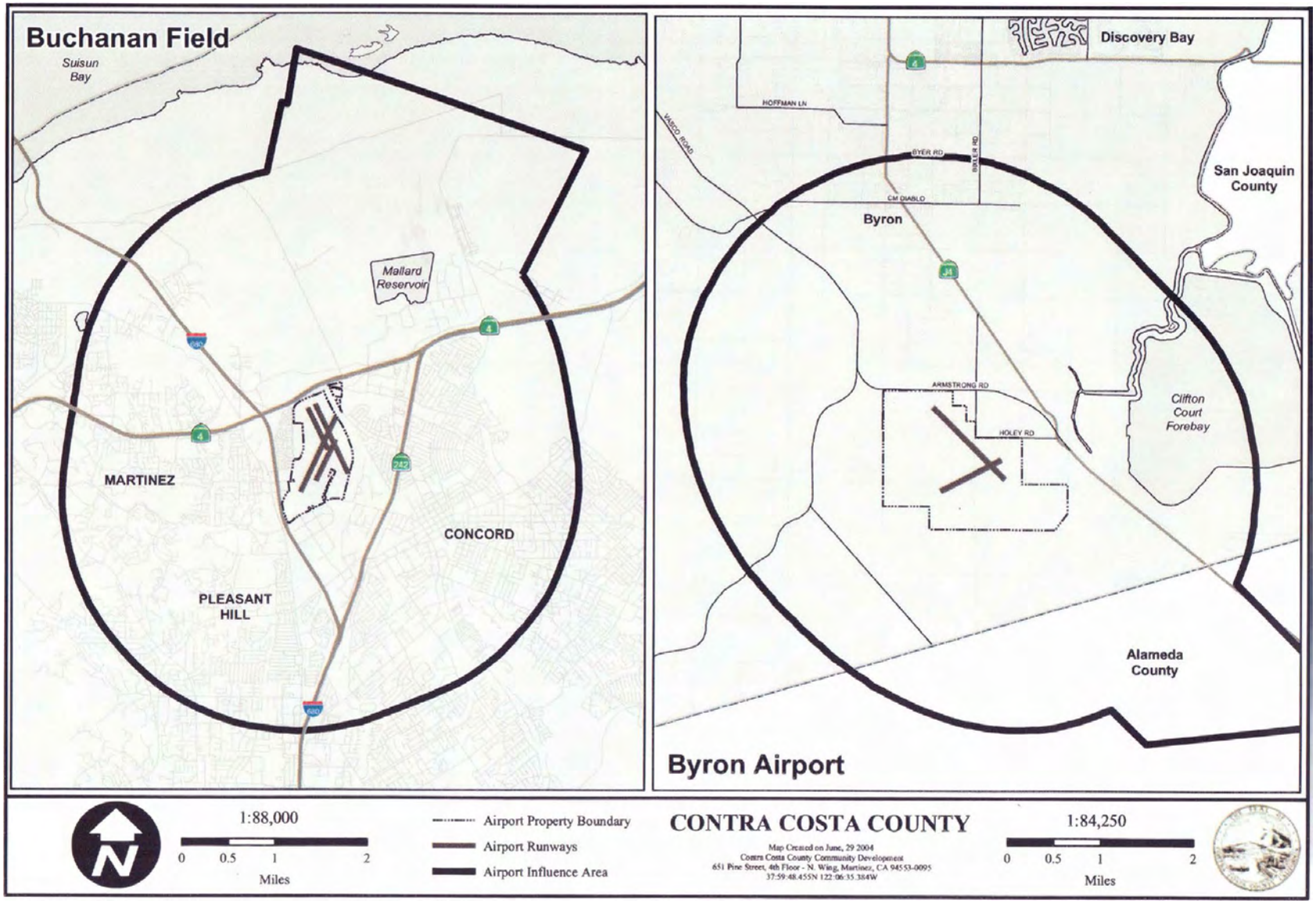
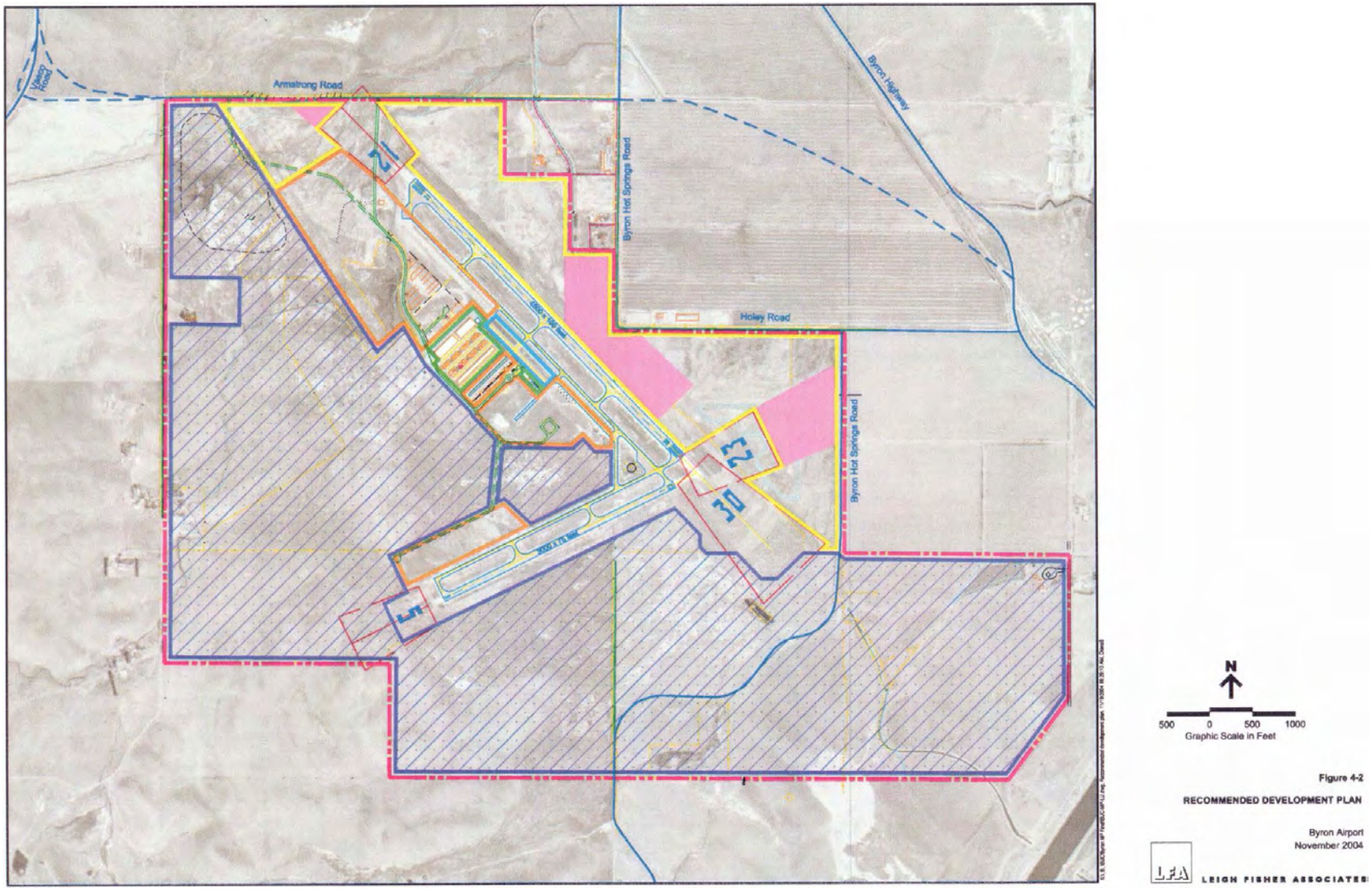


Figure 3.1-6: Byron Airport Recommended Development Plan

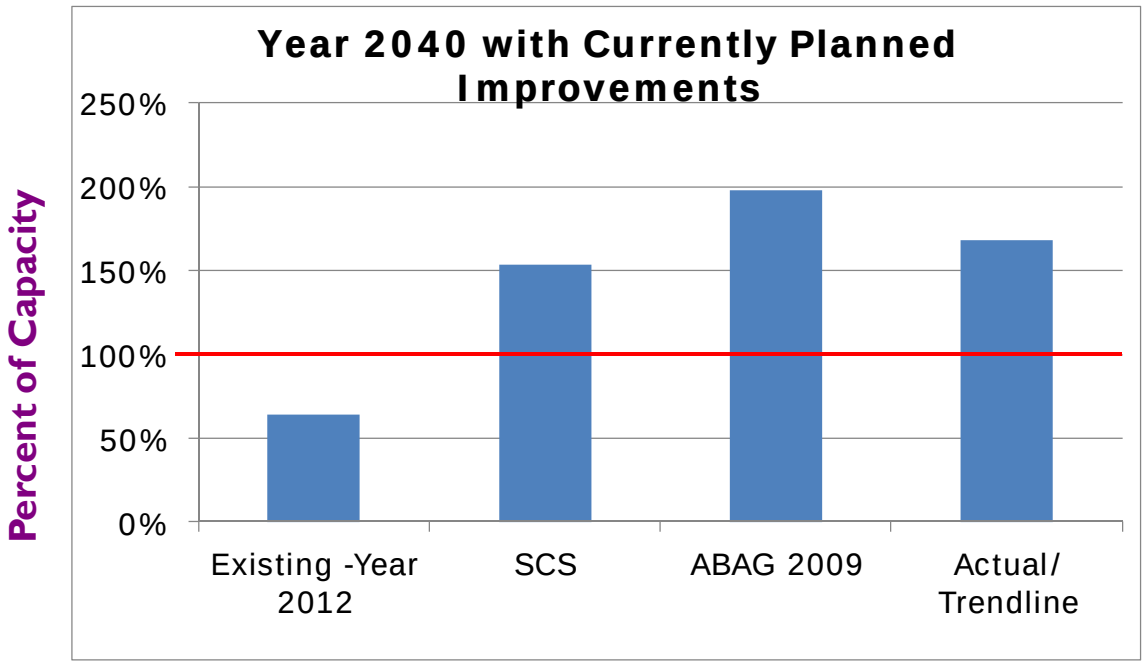


All three of these components – the expressway route parallel to Byron Highway, the transit route connecting east Contra Costa and west San Joaquin counties, and the Airport link connecting Vasco Road to Byron Highway – are incorporated in the TriLink (SR 239) Study.

3.2 Traffic Demand Growth Estimates

As shown in Figure 3.2-1, socioeconomic projections for the study area indicate that Byron Highway will exceed its capacity by 150 to 200 percent by 2040 with the currently planned improvements. This indicates that additional improvements are required in the study area to relieve future congestion.

Figure 3.2-1 Traffic Demand Growth Estimates for Byron Highway



Source: CDM Smith.

The Ten-County travel demand model predicts the region's travel conditions by simulating travel behavior. The land use projections in the Ten-County Model reflect Projections-2009, with 2000-2040 incremental growth forecasts based on ABAG and SJCOG, adjusted to reflect actual 2010 conditions. The network assumptions are based on the Regional Transportation Plan (RTP) (Transportation 2035).

The outputs of the model include information about the network conditions for vehicles and transit[11], as well as the travel patterns. The traffic evaluation was completed for the existing base year (2010) and future (2040) conditions. This allowed the study team to examine existing and future conditions measures.

3.3 Travel Patterns

Many area residents commute to jobs outside their communities, as reflected by the current jobs/housing imbalance which is approximately 0.5 jobs per household.[12] Assuming 1.2 workers per household, this translates into 0.7 workers per household who commute to employment locations outside the study area. This commute pattern contributes to the congestion observed on area roadways, such as Vasco Road, which is currently at or near its capacity. Figure 3.3-1 shows the existing daily traffic volumes on roadway links within the study area. The daily volume on Byron Highway within the study area is expected to double by 2040 without the TriLink improvements, as shown in Figure 3.3-2.

With the TriLink improvements in place in 2040, traffic would be diverted off Byron Highway and Vasco Road, returning Byron Highway to a daily volume of 10,000, which is just below its 2010 daily volume of 12,000, and Vasco Road to a daily volume of 19,000, which is below its 2010 daily volume of 22,000, as shown in Figure 3.3-3. As also shown in the figure, there would be approximately a 10 percent reduction in ADT volumes on I-580 west of the I-580/I-205 interchange. Figure 3.3-4 shows the percent decreases and increases in ADT with the TriLink improvements in place in 2040.

A base year (2010) scenario was used to reflect a hypothetical situation if the TriLink project were implemented immediately, and it indicates what the effect of the TriLink project would be on the traffic flow and patterns that can be observed today. As shown in Figure 3.3-5, the traffic diversion pattern in the 2010 hypothetical scenario is similar to the diversion pattern in 2040 with TriLink.

[11] Using the SJCOG's transportation model, a 3 percent reduction in vehicle work trips due to transit ridership is assumed in 2040.

[12] A jobs/housing balance of less than approximately 1.5 indicates a net out-commute; therefore, the local ratio of 0.5 jobs per household suggests that many area residents commute to jobs outside their communities.

Figure 3.3-1: 2010 Traffic Volumes – Existing

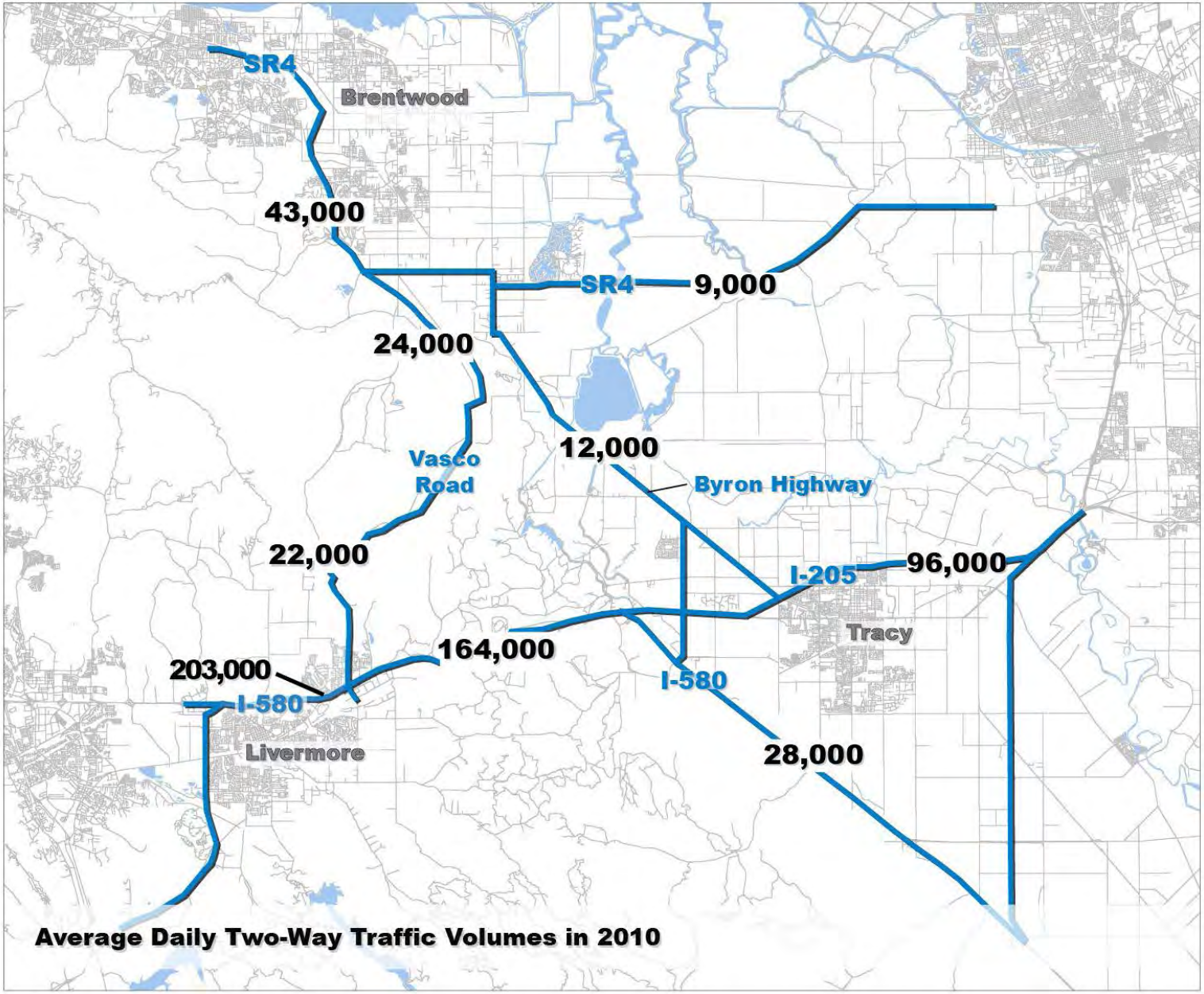


Figure 3.3-2: 2040 Traffic Volumes – No Build

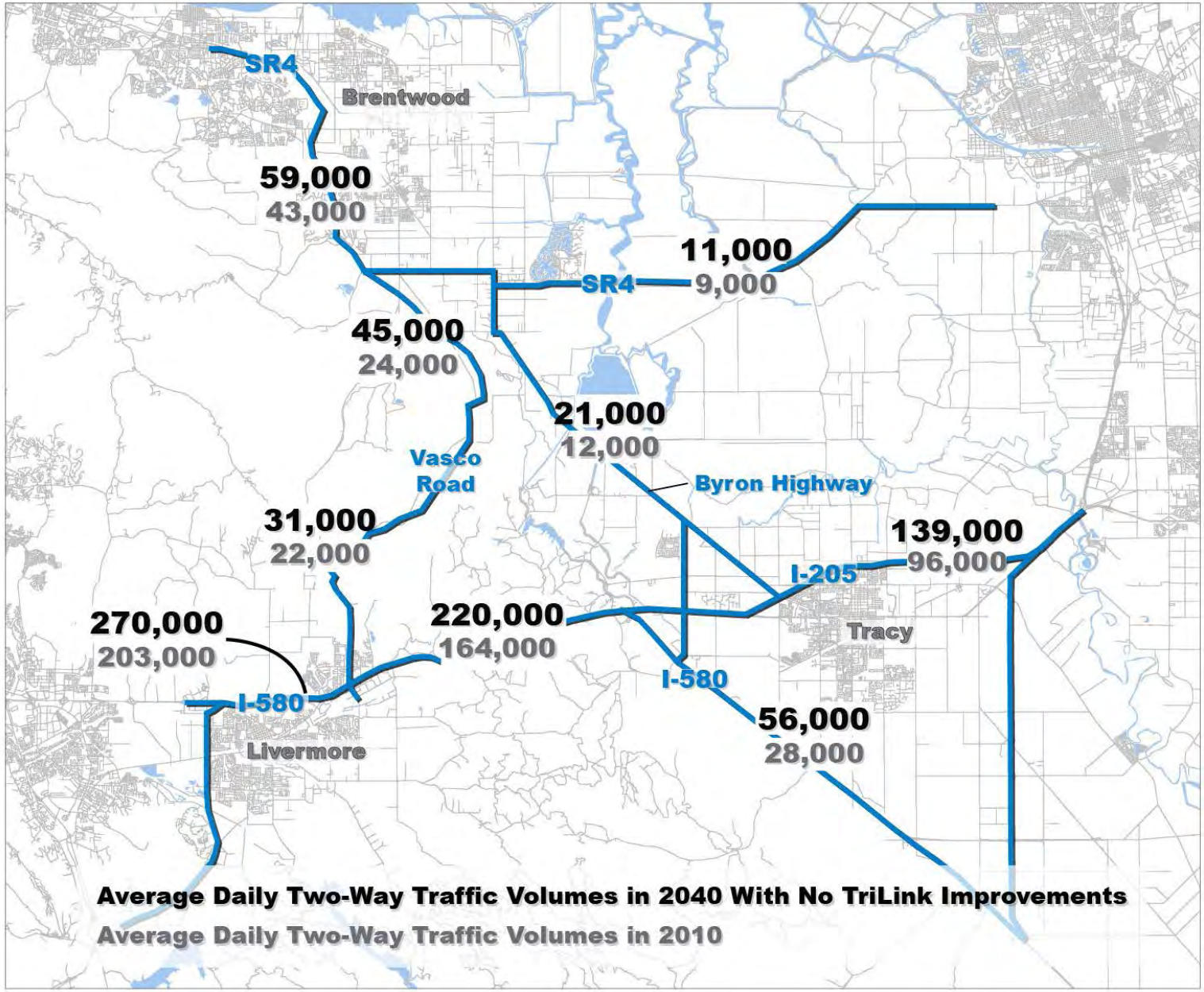


Figure 3.3-3: 2040 Traffic Volumes - with TriLink

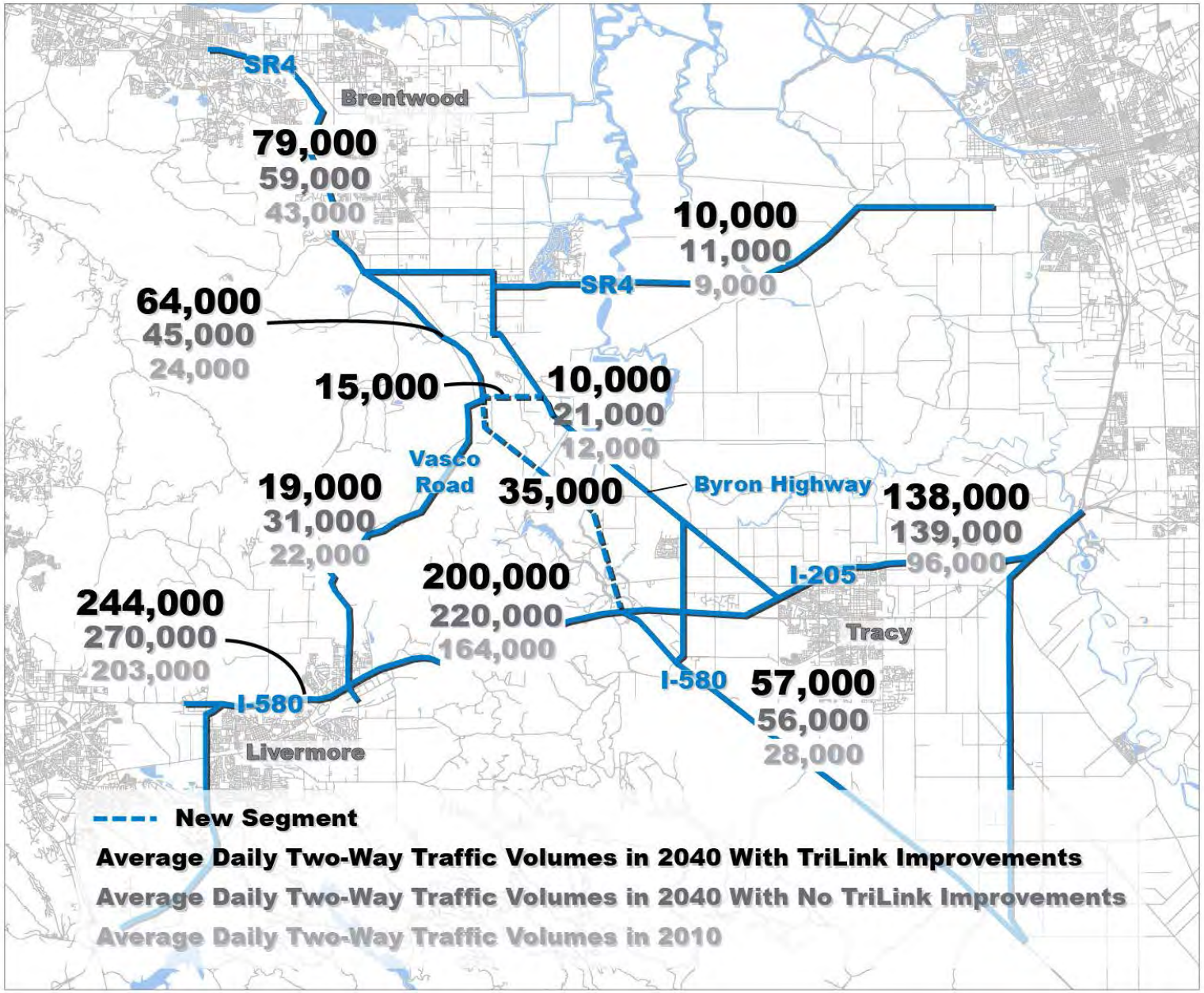


Figure 3.3-4: Change in Average Daily Traffic (ADT) with TriLink

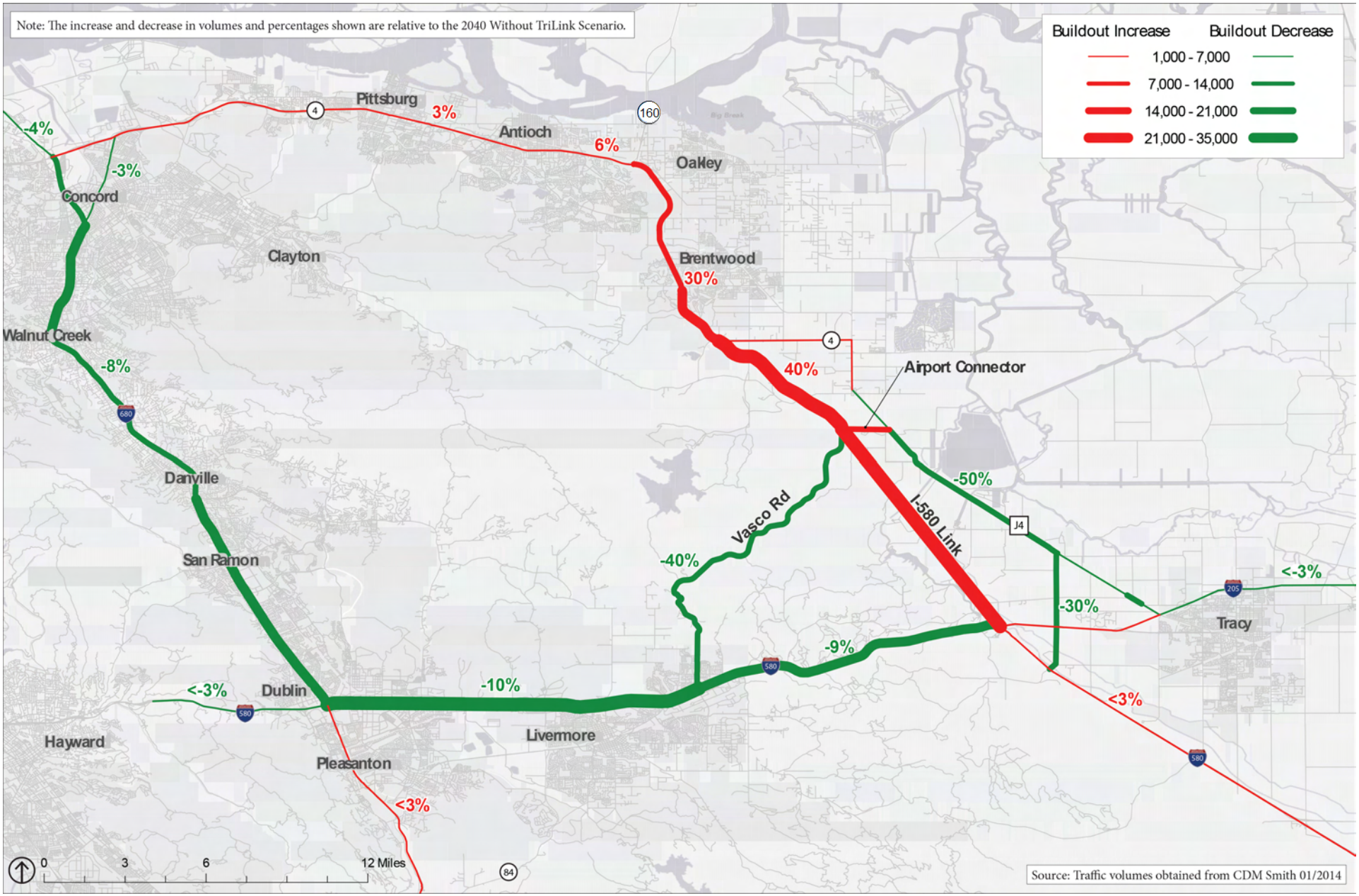
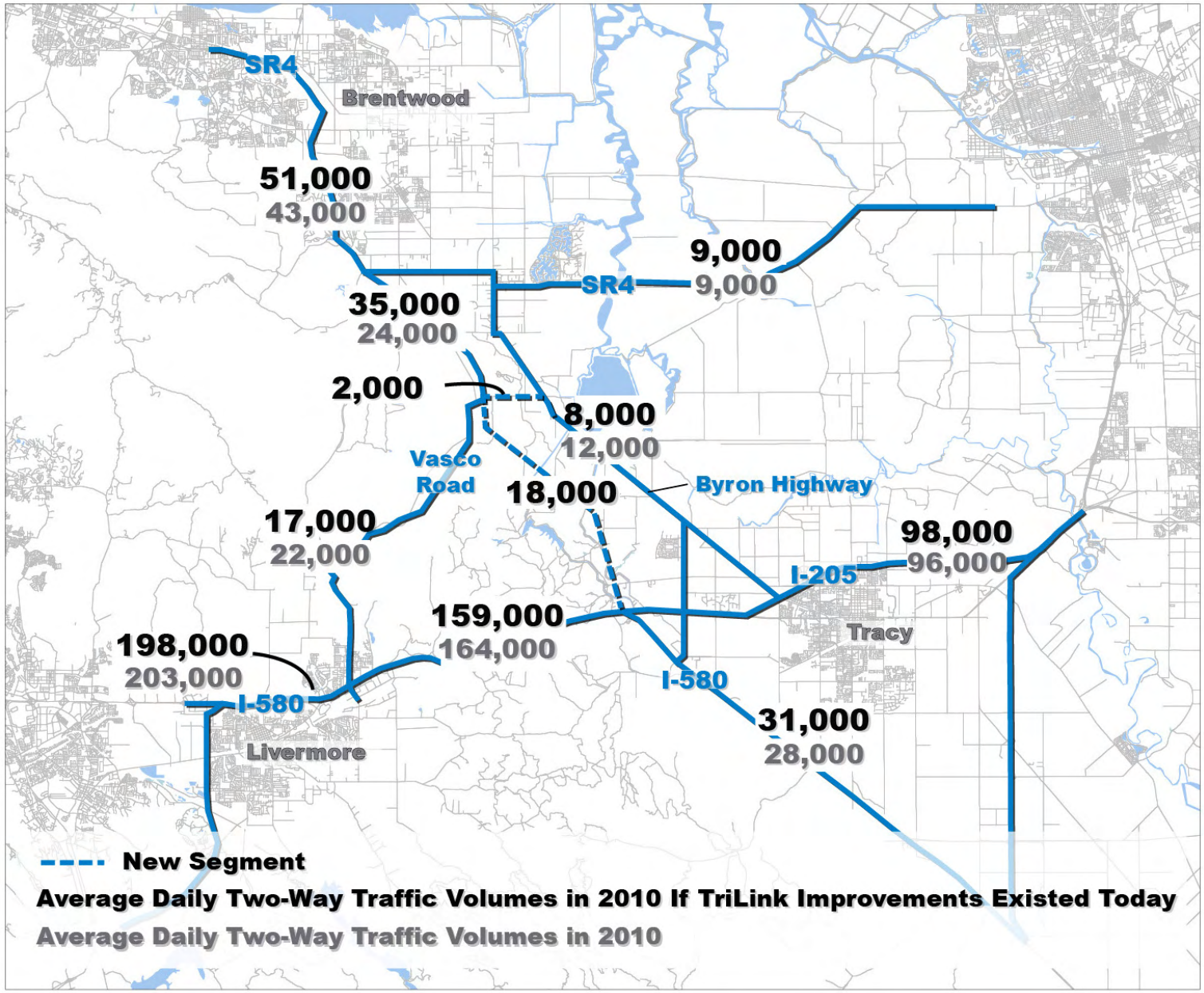


Figure 3.3-5: 2010 Traffic Volumes - with TriLink



3.4 Goods Movement

To determine the potential benefit of the TriLink corridor elements to commercial vehicle traffic, the Study Team conducted a goods movement analysis for the study area. The analysis examined existing and future conditions.

Heavy and medium truck traffic on Byron Highway accounts for approximately 23 percent of the traffic. Typically 5 to 8 percent of the traffic on most highways is truck traffic, so the truck traffic on Byron Highway is very high. Other roadways in the study area, such as I-580, also carry an above average number of trucks, as shown in Table 3.4-1. This is because I-580 is a major gateway to the Bay Area from the Central Valley due to constraints on other roadways and limited interregional connectivity. The Altamont Pass is a natural bottleneck with steep grades, and heavy-duty trucks are not allowed on SR 4 between Stockton and Discovery Bay due to tight curves at several of the bridge approaches on the route. These trucks must divert south to I-205 or north to SR 12. The proposed I-580 Link could serve as an alternative for trucks, thereby reducing the number of trucks on Byron Highway.

Table 3.4-1 Existing Truck Traffic Volumes in the Study Area

Location	Average Daily Traffic (2011)	Heavy and Medium Trucks (3 or more axles)	Percent Trucks
Byron Highway (at San Joaquin County line)	11,500	2,650	23
Vasco Road (at Alameda County line)	20,900	1,460	7
SR 4 (east of Discovery Bay)	8,700	1,220	14
SR 12 (at San Joaquin County line)	15,200	1,820	12
I-580 (at Alameda/San Joaquin County line)	151,000	15,700	10.4

Source: CDM Smith, 2013.

3.4.1 Congestion in the Study Area

In addition to the I-580 Link serving as an alternative for trucks on Byron Highway, the TriLink improvements could reduce traffic volumes on existing facilities and reduce travel time for trucks. This section summarizes the existing speeds on facilities within or adjacent to the study area. The American Transportation Research Institute (ATRI) performed a review of sample truck speeds obtained from real-time monitoring of the truck radio-frequency identification (RFID) cards on the following:

- I-5 near Tracy
- I-580 from the intersection with I-205 to I-5
- I-205 between Tracy and I-580
- Byron Highway/SR 4 from I-205 to SR 160
- Vasco Road/SR 4 from I-580 to SR 160
- SR 12 from I-5 to SR 160
- SR 4 from I-5 to SR 4

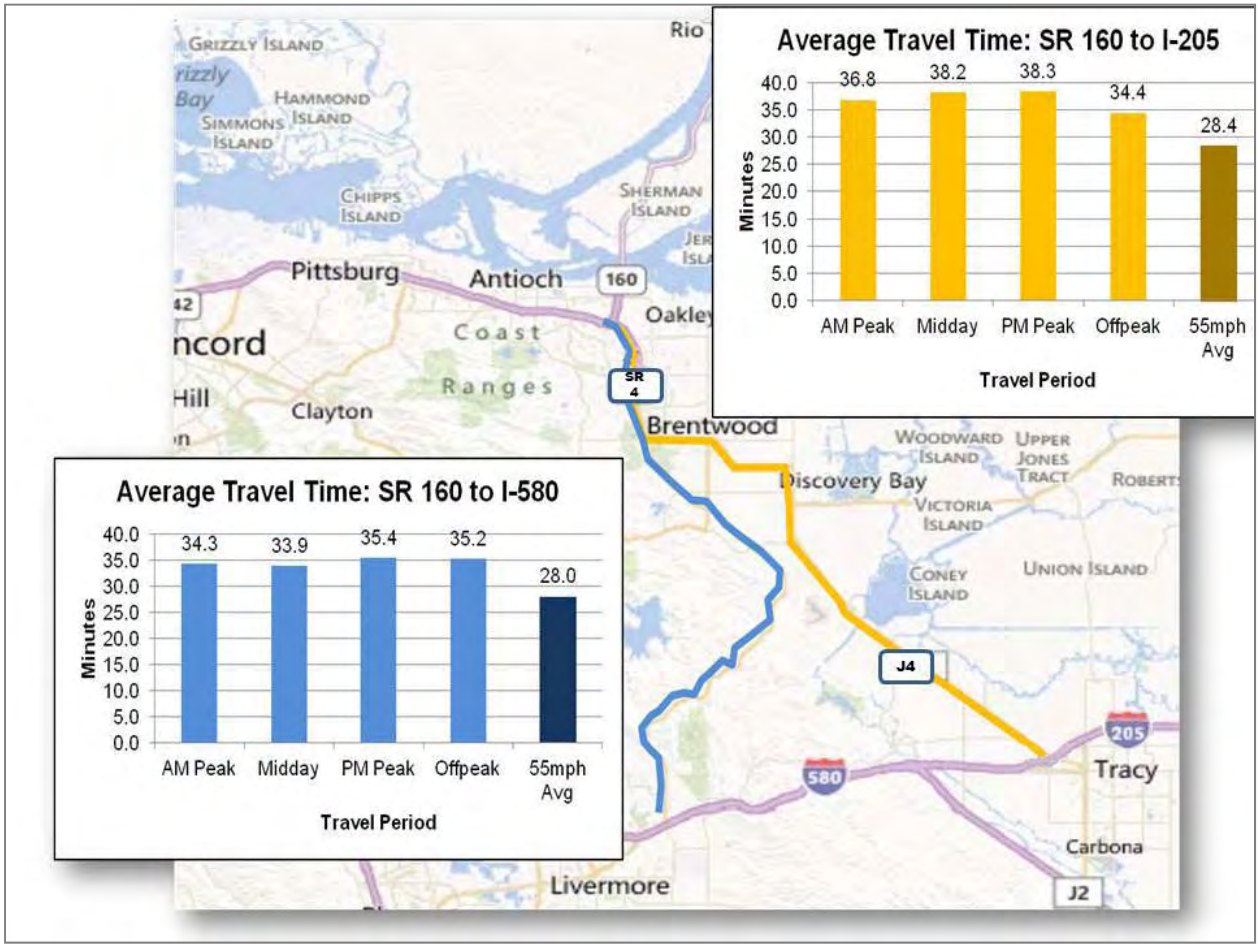
The following two corridors exhibited more severe declines in speeds during peak hours:

- Byron Highway/SR 4 between I-205 and SR 160
- Vasco Road/SR 4 and between I-205 and SR 160

Figure 3.4-1 shows the recorded travel times for each time period versus a 55 mile per hour (mph) average speed for Byron Highway and Vasco Road. Both corridors experienced the greatest effects of congestion during the PM peak period, with several segments indicating speeds less than 75 percent of off-peak values. The average travel time analysis indicates that if speeds were 55 mph throughout, a truck could traverse either corridor in approximately 28 minutes; however, neither corridor reaches this ideal performance during any time of the day.

The greatest variation from optimal performance is observed during the PM peak on the Byron Highway/SR 4 route, where travel would take approximately 10 additional minutes. With speeds previously below 40 mph on several of these segments, this may be an indication of a serious impediment. It should be noted, however, that the effects of congestion are disproportionate on the regional network and appear to be constrained to specific segments and locations.

Figure 3.4-1 Corridors with Increased Congestion



Source: CDM Smith; ATRI.

3.4.1.1 Time Period Analysis

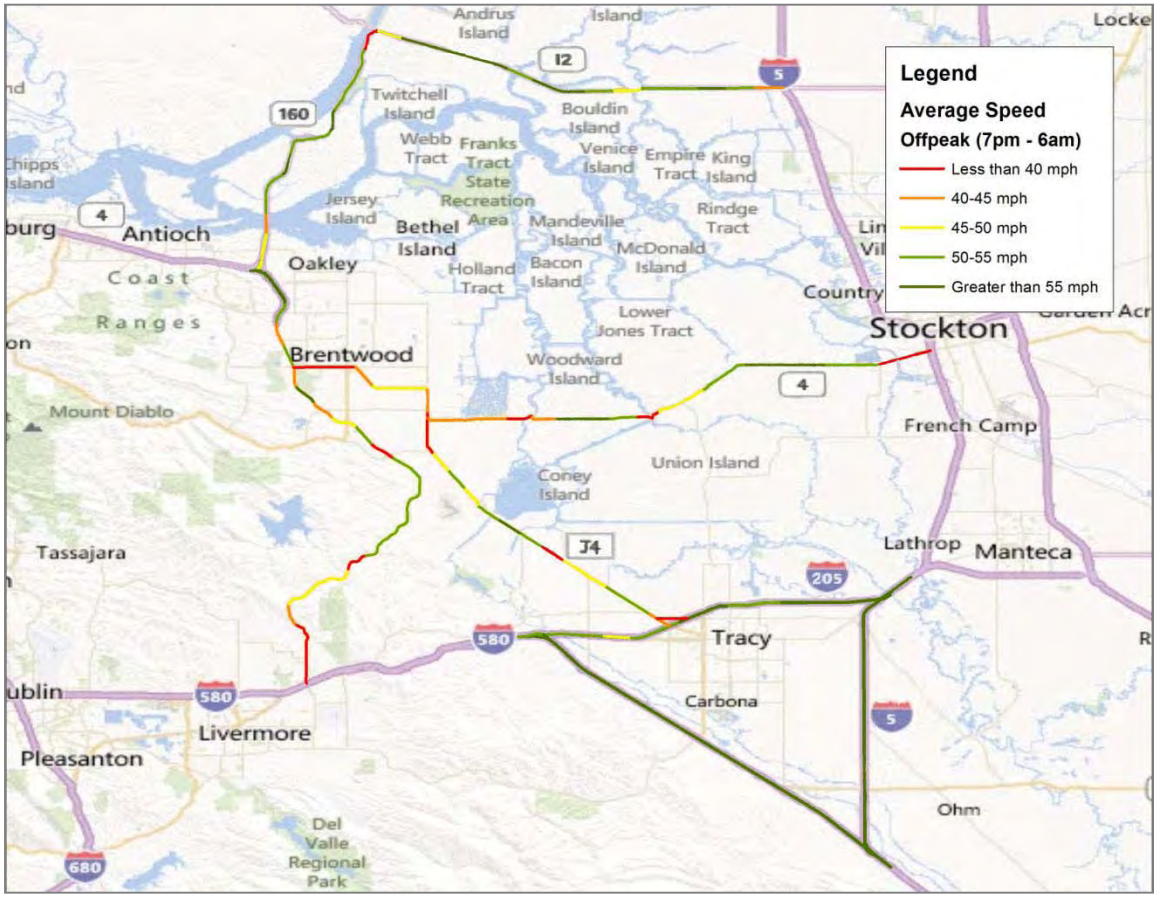
Four periods of time, within a given 24-hour period, provide typical evaluation standards for the review of commercial vehicle flow (e.g., off-peak, AM peak, midday, and PM peak). Each represents a set of conditions where traffic characteristics can be expected to exhibit unique conditions. The associated time frames are as follows:

- Off-peak: 7:00 PM – 5:59 AM
- AM Peak: 6:00 AM – 9:59 AM
- Midday: 10:00 AM – 2:59 PM
- PM Peak: 3:00 PM – 6:59 PM
- Average of all hours: 12:00 AM – 11:59 PM

Off-Peak

Figure 3.4-2 illustrates the average off-peak speed for each 1-mile segment of the studied roadways. These average speeds were compiled using data obtained between May and June 2012 from individual trucks operating in the study area and reporting a verified dataset to ATRI. Segments with the lowest average speeds are shown in red, and those with the highest average speeds are shown in green.

Figure 3.4-2 Off-Peak Average Truck Speeds



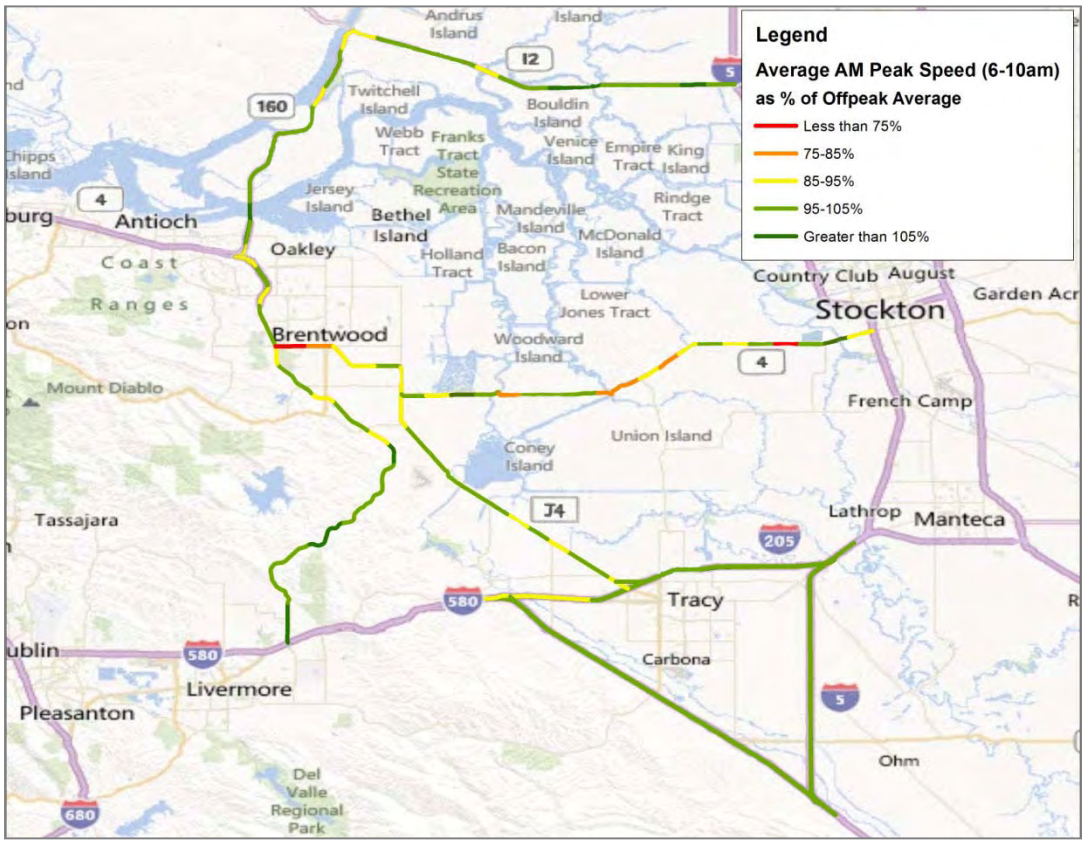
Source: CDM Smith; ATRI.

AM Peak

Figure 3.4-3 illustrates a comparison of AM average speeds to off-peak or baseline speeds by displaying AM average speeds as a percent of the off-peak values. Yellow segments have minor congestion, orange segments have moderate congestion, and red segments have significant congestion compared to off-peak values. The most congested segments during the AM period

are Balfour Road between SR 4 and Brentwood Boulevard. Speeds on these segments attain 85 percent of the 40 mph off-peak values.

Figure 3.4-3 AM Average Truck Speeds as Percent of Off-Peak Average



Source: CDM Smith; ATRI.

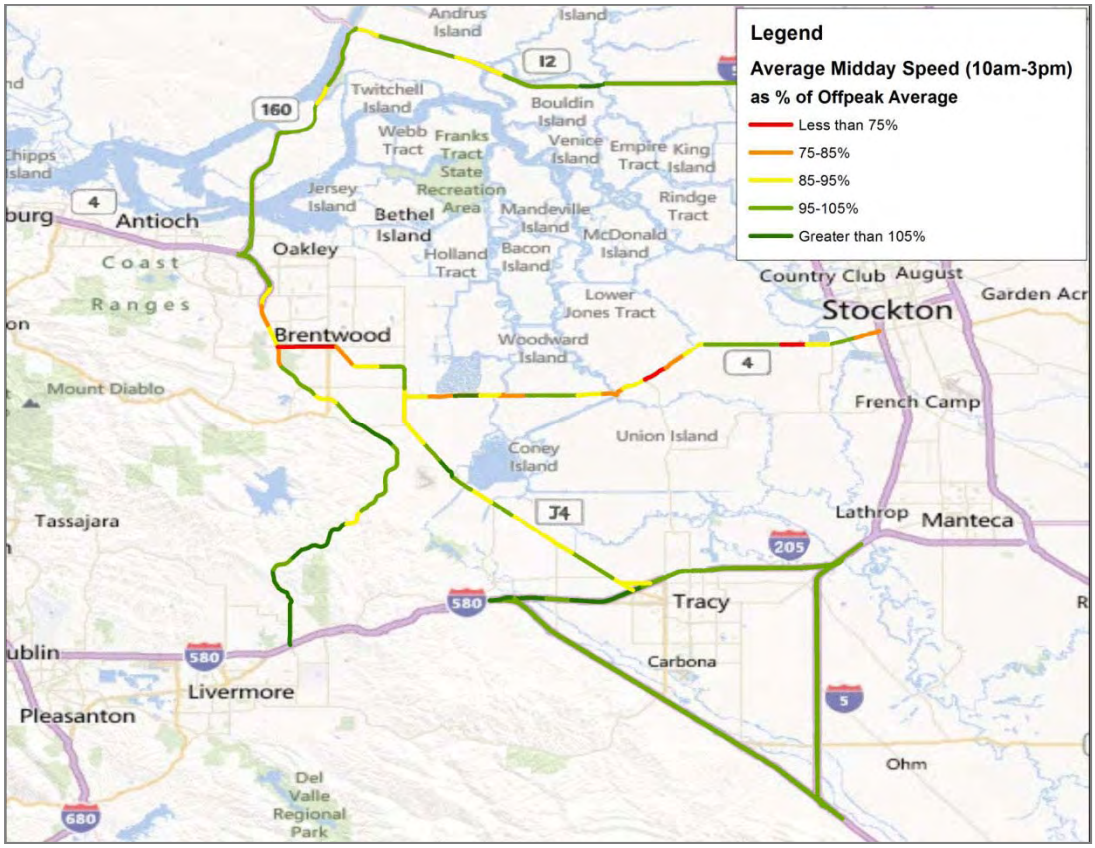
SR 4 between Maybeck Road and Wilhoit Road, near Stockton, performed poorly during the AM peak period. Other segments on SR 4 experienced AM peak speeds between 75 and 85 percent of the off-peak average speed. Specific segments included those near the Old River Bridge and the Middle River Bridge.

All other segments in the network operate at speeds that are at least 85 percent of the off-peak baseline. A few segments exceed the off-peak speeds.

Midday Peak

Figure 3.4-4 illustrates the existence of increasing congestion during the midday hours. This occurs predominantly on the segments near the intersections of Balfour Road and SR 4 and Balfour Road and Brentwood Boulevard. Between the hours of 10:00 AM and 3:00 PM, all of Balfour Road experiences average truck speeds that are consistently 75 percent or less of the off-peak hours. Brentwood Boulevard, where speeds were 85 to 95 percent of off-peak averages in the AM period, has a 10 percent decrease in average speeds on those segments closest to Balfour Road. SR 4 near Balfour Road notes a reduction in speeds, with congestion occurring several miles north to Lone Tree Way. Conditions deteriorate on SR 4 in the midday hours, particularly near Tracy Boulevard, which exhibits speeds below 75 percent of off-peak values. Speeds increase on I-205 between I-580 and Exit 6 (Grant Line Road) compared to AM speeds, and they surpass off-peak values on several segments.

Figure 3.4-4 Midday Average Truck Speeds as Percent of Off-Peak Average

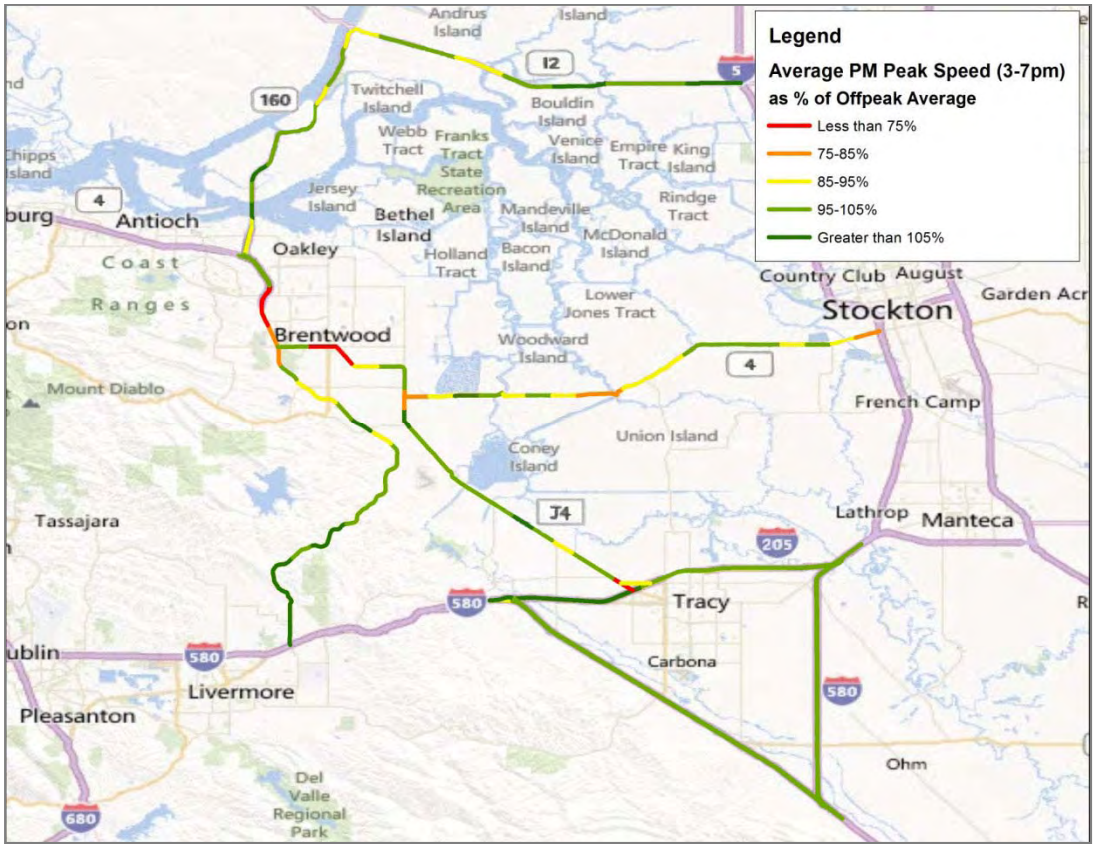


Source: CDM Smith; ATRI.

PM Peak

The trend observed at midday continues into the PM peak hours, as shown in Figure 3.4-5. PM average speeds exhibit the worst conditions compared to the off-peak average. Segments closest to Balfour Road continue to experience decreases in average speed. Speeds on I-205 between I-580 and Byron Highway continue to increase. Conversely, speeds appear to improve along SR 4 during the PM peak, with no segments exhibiting average speeds below 75 percent of the off-peak average. One segment of Balfour Road exhibits a large increase in average speeds from the AM and midday averages. The segment intersecting with SR 4 operates at speeds that are 95 to 100 percent of the off-peak average. This is most likely due to regional commuting patterns, which contribute to truck congestion. The network, however, is not analyzed by direction of travel; therefore, it is possible that travel in one direction is less significant during these hours, resulting in an increase in travel speeds for this segment.

Figure 3.4-5 PM Average Truck Speeds as Percent of Off-Peak Average



Source: CDM Smith; ATRI.

3.4.2 Regional Generators and Goods Movement Patterns

A study conducted by SJCOG showed that 13 percent of the commercial vehicle traffic on I-580 was related to the Port of Oakland, indicating that most of the truck traffic on I-580 is not port related (2011) (SJCOG, 2011). The freight flows from San Joaquin County to the nine Bay Area counties show that flows to Alameda County where the port is located are the largest, comprising 21 percent of the total; however, the overall distribution is dispersed across the counties, as shown in Table 3.4-2. The volume of freight seems to be strongly related to the size of each of the counties in terms of population and employment and not just to the port location. This suggests that population and employment forecasts may be a viable indicator of the growth of goods movement on a regional basis.

Table 3.4-2 Freight Flows from San Joaquin County to Bay Area Counties

County	Truck Tons	Percent	Population*	Percent	Employment*	Percent
Alameda	1,456,745	21	1,510,271	21	716,257	21
Contra Costa	1,219,707	17	1,049,025	15	482,898	14
Marin	93,422	1	252,409	4	125,177	4
Napa	208,294	3	136,484	2	63,873	2
San Francisco	1,051,889	15	805,235	11	444,628	13
San Mateo	701,355	10	718,451	10	360,951	10
Santa Clara	1,355,308	19	1,781,642	25	843,854	24
Solano	497,340	7	413,344	6	185,585	5
Sonoma	460,237	7	483,878	7	233,182	7
Total	7,044,297	100	7,150,739	100	3,456,405	100

Source: CDM Smith.

3.4.3 Study Area Freight Generators

There are many existing and potential future freight generators in the study area. These include many regional distribution warehouses in Tracy, the largest of which is the Safeway Stores center. In addition, Amazon.com recently announced plans to build a large distribution center in the city. Other existing generators include the major Union Pacific Railroad (UPRR) intermodal rail-to-truck transfer facility in Lathrop and numerous facilities in Stockton: agricultural distribution centers, such as the O-G Packing & Cold Storage Company site, which employs more than 1,000 workers; the Burlington Northern Santa Fe (BNSF) Railroad

intermodal yard facility; and a port with access to the Sacramento River and the Bay Area via the Stockton Deepwater Channel. The Port of Stockton has 7.7 million square feet of warehouses that are either operated by the Port or leased to tenants who provide their own labor. The Port has access to I-5, and its facilities are served by two transcontinental railroads.

There are many potential future projects and activities of note that could influence goods movement:

- Byron Airport – The Byron Airport was originally built to serve as a reliever airport to Buchanan Field in Concord. Land on the airport site and to the northeast is zoned for airport-related development. There is potential in the longer term for the airport to develop as a commercial center attracting tenants that would require access to the airport to support their business activities. This would likely result in increased truck travel to and from the airport.
- I-580 Truck Climbing Lanes – There are two projects under development to provide increased truck capacity on I-580 on the eastern and western uphill approaches to the Altamont Pass:
  - I-580 Eastbound Truck Climbing Lane, which is included in the 2035 Metropolitan Transportation Commission (MTC) Plan for Alameda County I-580; and
  - Westbound Truck Climbing Lane on I-205/I-580 from Mountain House Parkway to the Alameda County line.

  The I-580 Eastbound Truck Climbing Lane is fully funded and included in Proposition 1B – Trade Corridors Improvement Fund.[13] The Westbound Truck Climbing Lane, however, is not fully funded at this time. The SJCOG I-580 Interregional Multimodal Corridor Study concluded that "A truck climbing lane is expected to significantly improve LOS [Level of Service] of Segment A in both directions for the 2020 analysis year. By 2035, the operational benefits of removing truck traffic from the mixed-flow lanes are not sufficient to achieve acceptable levels of service in the mixed-flow lanes."

- California's Green Trade Corridor Marine Highway – The California Green Trade Corridor/ Marine Highway Project is a collaborative effort of the Port of Oakland, along with the inland ports of Stockton and West Sacramento, to develop and use a marine highway system as an alternative to existing truck and rail infrastructure. A Transportation Investment Generating Economic Recovery (TIGER) grant is to be used to provide freight

[13] The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, approved by the voters as Proposition 1B in 2006, made $2 billion available for infrastructure improvements along federally designated "Trade Corridors of National Significance" in California or along other corridors within California that have a high volume of freight movement (http://www.dot.ca.gov/hq/transprog/ibond.htm).

operations infrastructure and services, via barge, primarily for consumer goods moving by ocean vessel and agricultural products grown in central California. The present plan calls for 250 containers to be transported in each direction once per week. This could result in transferring 180,000 truck trips in each direction off of I-580 each year. These truck trips would have been destined to the Port of Oakland. As such, they are not candidates to use the TriLink improvements because the SR 239 corridor would not provide any improvement in travel time or distance for trips to the Port of Oakland.

- SR 4 – The SJCOG I-580 Interregional Multimodal Corridor Study concluded "that SR 4 would be an attractive alternative route for some of the truck traffic now using I-580 between the northern Bay Area and Central Valley points north and south of Stockton (and Tracy), but it is not now usable for regular heavy-duty truck trips, as detailed under Existing Conditions. The section of SR 4 between Antioch and Discovery Bay is now being converted to a new bypass rather than continue as the main thoroughfare of Oakley and Brentwood. Between Discovery Bay and Stockton, SR 4 is a light-duty rural road with two bottlenecks at bridges. In both cases, the approaches to the bridges are on restrictive curves, and the bridges themselves are too narrow for heavy-duty trucks to pass each other when on the bridge deck. Additionally, SR 4 is not eligible to become a STAA [Surface Transportation Assistance Act]-approved route at the points where these bridges are located. Accordingly, truck traffic on the portions of SR 4 east and west of these bridges is largely confined to local trips with single-unit vehicles that are smaller than heavy duty." There are no projects in the planning or development stages to correct these deficiencies on SR 4. Heavy-duty truck trips will likely continue to divert to I-205 and would be candidates to use the TriLink corridor.

3.4.4 Route Selection Factors

The mileage of a truck plays a significant role in route selection decisions. Time savings is important, but it must be weighed against the cost of any added travel distance. Interview results with carriers (managers) and operators indicate that TriLink would be considered a viable alternative if congestion relief and time savings were realized. The operator's positive responses were influenced by the experience of traveling within the congested corridor along I-580. The results showed 41 percent would use the TriLink corridor, 47 percent would "possibly" use, and 12 percent would not use or could not answer.

3.5 Truck Traffic Forecast Results

The truck forecasts are based on information gathered on existing speed, freight generating facilities, and interviews, as well as the travel time and distance savings forecast by the Ten-County travel demand model that was developed as part of this study.

3.5.1 Time and Distance Savings

Table 3.5-1 shows the travel time information from the Ten-County Model for three comparative routes and two scenarios in the study area. Scenario 1 assumes a starting point in Tracy (I-580 at Patterson Pass Road) and an end point in Brentwood (SR 4 at Marsh Creek Road) during the commute peak period. Scenario 2 assumes a starting point in Tracy (1-205 at Grant Line Road) and an end point in Brentwood (SR-4 at Marsh Creek Road). The travel times presented are not precise and should only be used to compare the travel times of different routes.

As Table 3.5-1 shows, the travel times for trucks that choose to use the Byron Highway routes would be very similar in all scenario options, and there would be a slight increase in travel times with the construction of TriLink. In the no-build scenario, the shortest route for the trucks using Byron Highway is from south to north – Byron Highway to Camino Diablo, Camino Diablo to Vasco Road, and Vasco Road to Marsh Creek Road. In the scenario options with the I-580 Link, the route changes slightly – the trucks would use Byron Highway to the Airport Connector, Airport Connector to the North Link, and North Link to Marsh Creek Road. Travel times on these two Byron Highway routes are very similar, as the numbers show in Table 3.5-1. In both cases, the trucks avoid the northern section of Byron Highway from Camino Diablo to Marsh Creek Road, which is where most of the delay on Byron Highway occurs.

Table 3.5-1 Congested Minutes Traveled – Peak Period Based on 65 mph Average Speed

Route	Vasco Road	Byron Highway	I-580 Link
Scenario 1 – I-580			
Existing 2010	46.2	26.2	NA
No Build 2040	53.3	26.1	NA
2010 with TriLink	37.0	27.3	15.8
2040 with TriLink	34.4	27.0	15.8
Scenario 2 – I-205			
Existing 2010	49.3	25.3	NA
No Build 2040	56.5	25.3	NA
2010 with TriLink	39.4	26.4	18.1
2040 with TriLink	36.8	26.1	18.2

Source: CDM Smith.

The results in Table 3.5-1 indicate the following:

- The proposed I-580 Link is the quickest. Even in 2010, it is 1.5 times faster than the Byron Highway route and two times faster than Vasco Road.
- Travel times on Vasco Road in 2040 improve with TriLink because the I-580 Link diverts substantial traffic from Vasco Road, improving travel conditions on that route.
- The travel time differences increase in the year 2040 as traffic volumes and delays increase.
- The greatest benefit will be to trucks heading to the north via I-580 (Scenario 1), but the time savings via I-205 (Scenario 2) are close.

Table 3.5-2 shows the comparative distances for the two routes. The proposed I-580 Link provides a shorter route for trips in the I-580 corridor and a slightly longer route than Byron Highway for trips coming from I-205. Vasco Road is much longer and, for that reason, it is highly unlikely that trucks would use this route, given the cost sensitivity to mileage.

Table 3.5-2 Distance Traveled – Miles

Scenario	Route		
	Vasco Road	Byron Highway	I-580 Link
Scenario 1 – I-580	29.7	17.8	14.6
Scenario 2 – I-205	31.4	17.5	18.9

Source: CDM Smith.

Table 3.5-3 provides a comparison of distances and year 2010 travel times for a third scenario. This scenario represents trips from a starting point in Tracy (I-580 at Patterson Pass Road) and an end point at the junction of I-680 and SR 4 in Pacheco. This is an important trip because it highlights the greatest potential distance and time savings for longer-distance truck trips traveling from the Central Valley to points northeast of Tracy. It should be noted that the two existing routes are almost identical in distance to the proposed I-580 Link. The proposed I-580 Link would save approximately 3 miles, but overall distance is not a major factor in comparing the routes. There would, however, be a travel time advantage today if the I-580 Link were in place.

Table 3.5-3 Distance and Time Traveled – Tracy to Pacheco

	Route		
	I-580/I-680	Byron Highway/SR-4	I-580 Link/SR-4
Miles	45.9	45.7	42.5
Minutes (AM Peak 2010)	82.6	77.7	66.2

Source: CDM Smith.

As shown in Table 3.5-3, for many destinations to the northeast, including eastern Contra Costa County, northwestern Contra Costa County, and portions of Solano County, Napa County, and Sonoma County, the I-580 Link would provide a distinct travel time savings in the range of approximately 10 or 16 minutes depending on the origin route (Byron Highway or I-580/I-680) chosen.

3.5.2 Truck Volumes Forecast

The consideration of time and distance was used to develop estimates of the future truck volumes that could be expected with the growth of the ten-county region. The SJCOG I-580 Interregional Multimodal Corridor Study prepared in 2011 estimated that truck volume growth will outpace growth of population and employment in San Joaquin County. This study identified a year 2035 increase of 60 percent in the number of trucks using I-580 at the Alameda county line. This suggests that the volume of trucks will increase from 15,700 in 2010 to 25,100 in 2040. With the increased congestion over Altamont Pass, there will be an increased incentive for trucks with destinations to the northeast to divert to the TriLink corridor.

Today, Byron Highway appears to attract approximately 12 percent of the truck traffic entering the Bay Area from San Joaquin County. Examining the inter-county freight flow data shown in Table 3.4-2 suggests that as much as 34 percent of the truck traffic from San Joaquin County would use an improved connection via TriLink to access Contra Costa County (17 percent), Solano County (7 percent), and all of Napa (3 percent) and Sonoma (7 percent) counties. This would suggest a potential increase of as much as 273 percent of the current truck volume (2,650 daily trucks) on Byron Highway (34 percent of 21,390 daily trucks entering the Bay Area or 7,245 total trucks); however, a shift of this nature would be dependent on major mileage and travel time savings for trucks that would use the TriLink corridor. Realistically the mileage incentive is low, but there is a potential travel time savings such that, given nearly equal distances, many truck operators and truck drivers would elect to use the new route. The average time savings for trips from a starting point in Tracy (I-580 at Patterson Pass Road) and

an end point at the junction of I-680 and SR 4 in Pacheco would be approximately 20 percent of the total travel time for the longer trip using I-580/I-680.

The estimated travel time savings for both trips within the study area and the longer-distance trips were used to develop the estimated average daily truck volumes in Table 3.5-4. The estimates are provided for the no-build and build scenarios with TriLink for the years 2010 and 2040. The number of trucks using Byron Highway today (2,650) would decline to 1,630 with the TriLink improvements because some of these trucks would use the I-580 Link and additional trucks would be diverted from I-580 and Vasco Road, resulting in 3,270 daily truck trips on the I-580 Link. This is because the TriLink improvements would be very attractive to longer-distance truck traffic, because they would offer a shorter, faster route for trucks that today take I-580 and then I-680 north of I-580 to reach northern Contra Costa County and other points to the northwest. This would result in a reduction of truck travel demand on I-580 over the Altamont Pass and through the Tri-Valley area, as well as on I-680 through central Contra Costa County. Diverted trucks would use the combination of the I-580 Link, the North Link, and SR 4. The total number of trucks using Byron Highway and the I-580 Link would be 4,900 daily trips, or an 85 percent increase over the volume of trucks currently on Byron Highway. A similar pattern would occur under year 2040 conditions, and the total number of trucks in the corridor would increase to 7,840, or almost three times the current volume on Byron Highway.

Table 3.5-4 Estimated Average Daily Truck Volumes

Location	2010 No Build	2010 With TriLink	2040 No Build	2040 With TriLink
I-580 at Alameda County Line	15,700	14,250	25,100	22,800
Byron Highway at San Joaquin County Line	2,650	1,630	4,240	2,610
Vasco Road at Alameda County Line	1,460	1,110	2,340	1,880
I-580 Link at Alameda County Line	NA	3,270	NA	5,230

Source: CDM Smith.

Chapter 4 Sustainability and Resources Stewardship

4.1 Green Design Principles Approach

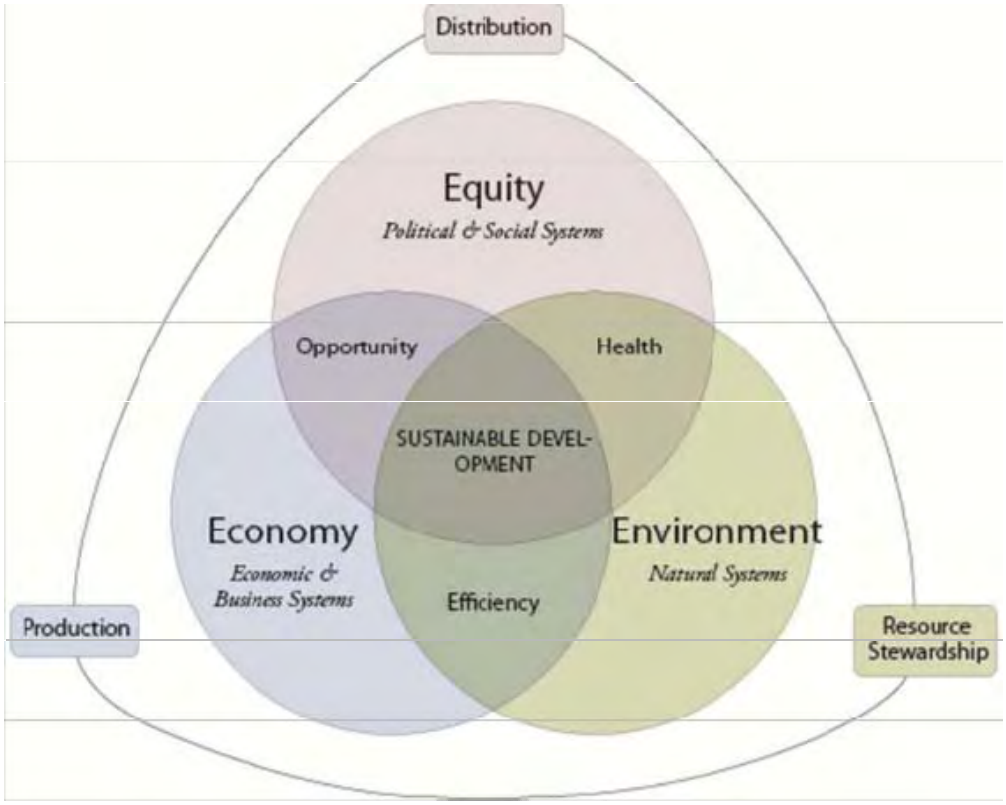
Sustainability provides a more systematic approach to planning than just addressing current and future needs. It is a way to address concerns about economic vitality, environmental health, and quality of life, looking at short- and long-term consequences, costs, benefits, and tradeoffs.

A sustainable approach to transportation design involves creating balanced choices among environmental, economic, and social values that will benefit current and future users. A sustainable approach looks at access (not only mobility), movement of people and goods (not only vehicles), and provision of transportation choices, such as safe and comfortable routes for walking, bicycling, and transit. Sustainability encapsulates a diversity of concepts as well, including the best use of limited funding, incentives for construction quality, regional air quality, climate change considerations, livability, and environmental management systems.

In the Bay Area, the MTC's RTP, T-2035, and its successor, Plan Bay Area, are guided by the following goals: build a stronger economy, protect the natural environment, and equitably enhance opportunities for Bay Area residents from all walks of life. Figure 4.1-1 illustrates the benefits of their interactions.

In addition, CCTA has prepared a discussion paper, "Incorporating Sustainability into the 2014 Countywide Transportation Plan" (January 16, 2013), which is being reviewed by its regional transportation planning committees in parallel with the initiation of the Action Plan Updates and the launching of the 2014 Countywide Transportation Plan.

Figure 4.1-1 The Triple Bottom Line: Economy, Environment, and Equity



Source: CCTA, December 2012.

In seeking sustainability, the TriLink study incorporates the following approaches:

1. Coordinate preliminary design and environmental review process as a collaborative, transparent approach, with all agencies participating as equal partners invested in the outcome of the process.
2. Seek public involvement throughout the entire process.
3. Go beyond minimum standards set forth by environmental laws and regulations.
4. Incorporate innovative uses for the corridor (e.g., charging stations, solar, carbon sequestration, ROW use for solar energy development).
5. Use innovative methods to reduce imperviousness and cleanse surface runoff throughout the corridor.
6. Maximize use of existing transportation infrastructure, provide multimodal transportation opportunities, and promote ride-sharing/public transportation.
7. Incorporate recycled materials to eliminate or reduce waste and reduce the amount of energy required to build the facility.
8. Achieve highest feasible sustainability rating under the Envision™ rating system.

Items 1 and 2 have been accomplished through TriLink's public participation program, which is described in more detail in Chapter 2. Item 3 will be actively pursued as part of the process for environmental clearance and mitigation identification. The concepts of Items 4 through 7 will be developed during the preliminary engineering phase of the project. Item 8 measures the success of the TriLink project's sustainability efforts.

4.2 Envision™ Rating System

Envision™ is the result of a joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. It is a holistic framework for evaluating and rating the community, environmental, and economic benefits of infrastructure projects, not simply in individual improvements, but in terms of their overall contribution to the communities they serve.

A highway system can be designed to preserve wildlife corridors, treat and infiltrate stormwater runoff, and be constructed using recycled materials, but unless it is planned, designed, and constructed in a way that integrates it with and strengthens the infrastructure systems within a community, its overall contribution to community sustainability is diminished and may even be negative. Thus, regardless of the quantity of recycled materials used or the extent of the wildlife corridors preserved, a highway system that creates opportunities for uncontrolled urban expansion would not be considered sustainable design.

Envision™ evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess sustainability indicators over the project's life cycle. There are four stages of assessment tools:

- Stage 1 – Self-assessment checklist is a yes/no sustainability checklist that would be used during TriLink's preliminary design stage to help users become familiar with the sustainability aspects of infrastructure project design. It would be used as a stand-alone assessment to quickly compare alternative alignments or to prepare for a more detailed assessment.
- Stage 2 – Third-party, objective rating verification allows CCTA, and/or other owners, to submit the project for recognition; includes a guidance manual and scoring system; and requires someone trained in the use of the Envision™ rating system to be an integral part of the project team to document sustainability achievements. An independent, third-party Verifier will validate the project team's assessment.
- Stage 3 – Tool for complex or multi-stage projects is under development.
- Stage 4 – Optimization support tool is under development.

Envision™ has 60 sustainability criteria, or credits, divided into five sections: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk, further described below. Each credit write-up includes intent, metric, levels of achievement, description, an explanation of how to advance to a higher achievement level, evaluation criteria and documentation, sources, and related credits.

- **Quality of Life: Purpose, Community, Well-Being –** Specifically addresses TriLink's impact on communities from the health and well-being of individuals to the well-being of the larger social fabric as a whole.
- **Leadership: Collaboration, Management, Planning –** Comprises the tasks that demonstrate effective leadership and commitment by all parties involved in TriLink: the meaningful commitment from the owner, team leaders, and constructors.
- **Resource Allocation: Materials, Energy, Water –** Measures the use of renewable and nonrenewable resources for the project (i.e., managing needed resources).
- **Natural World: Siting, Land & Water, Biodiversity –** Allows the Study Team to assess TriLink's effect on the preservation and renewal of ecosystem functions. This section addresses how to understand and minimize negative impacts while considering ways in which the infrastructure can interact with natural systems in a synergistic and positive way.
- **Climate and Risk: Emission, Resilience –** Looks at two main concepts: minimizing emissions that may contribute to increased short- and long-term risks and ensuring that TriLink is resilient to short-term hazards or altered long-term future conditions.

The amount of points earned in each credit depends on the level of achievement:

- Improved: Performance that is above conventional.
- Enhanced: Sustainable performance that is on the right track and that superior performance is within reach.
- Superior: Sustainable performance that is noteworthy.
- Conserving: Performance that achieves essentially zero impact.
- Restorative: Performance that restores natural or social systems.

In addition, innovation points are assigned in each of the five categories for exceptional performance beyond the expectations of the system and the application of methods that push innovation in sustainable infrastructure. Innovation credits act as bonus points that would be added to the TriLink score. For example, ways that the TriLink study could gain innovation points include the following:

- Provide job development and training that far exceed the restorative level and fundamentally revitalize a community's economy.
- Provide a stormwater management system as a community-wide resource for capturing stormwater, preventing erosion, and treating stormwater prior to release back into natural hydrologic systems.

4.3 Potential Green Uses of the Corridor

There is potential for the use of a wide variety of features and materials to enhance the sustainability of the corridor. Some examples include the following:

- Many agencies, such as Oregon Department of Transportation, are using solar power to generate electricity for infrastructure, such as interchange lighting, parking meters, bridge heating during freezing weather, and traffic signals.
- Solar road panel prototypes are being developed by Solar Roadways in Idaho.
- The West Coast Electric Highway includes charging stations every 60 miles or so along I-5 through Washington and Oregon, from the Canadian to the California border.
- Recycled materials (e.g., plastic, reclaimed/recycled concrete and asphalt materials; roofing shingle waste; scrap tires; waste rock) could be incorporated into the project as pavement, base, or subbase materials; embankment; rip-rap for slope protection; and landscaping, for examples.
- Carbon sequestration by planting native vegetation.
- Infiltration, retention, evapotranspiration for handling roadway runoff.
- Vehicle-to-roadside sensor communication for self-driving vehicles.
- Embedding light-emitting diode (LED) lights in the road surface to make nighttime driving safer.
- "Induction priority lane" for electric cars (i.e., underground induction coils charge vehicles as they drive down the lane).
- Partnering with I-Gate using TriLink corridor for demonstration projects.

During the next phase of the project, which includes preliminary engineering and environmental studies, these and other uses will be evaluated for incorporation into the project.

4.4 Habitat Conservation Strategies

4.4.1 East Contra Costa County Habitat Conservation Plan (HCP)/Natural Community Conservation Plan (NCCP)

The East Contra Costa County Habitat Conservancy is a Joint Powers Authority (JPA) formed by the cities of Brentwood, Clayton, Oakley, and Pittsburg and Contra Costa County to implement the East Contra Costa County HCP/NCCP (or Plan). The HCP/NCCP provides a framework to protect natural resources in eastern Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered species. The Plan will allow the JPA agencies, East Bay Regional Park District, and Contra Costa County Flood Control and Water Conservation District (collectively, the Permittees) to control endangered species permitting for activities and projects in the region that they perform or approve. The Plan also provides comprehensive species, wetlands, and ecosystem conservation and contributes to the recovery of endangered species in northern California. The Plan avoids project-by-project permitting that is generally costly and time consuming for applicants and often results in uncoordinated and biologically ineffective mitigation.

The construction of TriLink improvements would need approvals from many agencies, which could result in major delays, uncertainty, and significant costs; this causes some projects to spiral out of control. Project-by-project compliance with wetland and species regulations is not always best for the resources. This type of compliance emphasizes species surveys while lacking a means to effectively coordinate the avoidance and mitigation requirements of distinct projects. The Final HCP/NCCP provides a coordinated, regional approach to conservation and regulation. It replaces the current process of project-by-project permitting and fragmented mitigation, and instead benefits conservation, agencies, and project proponents alike.

Rather than individually surveying, negotiating, and securing mitigation, TriLink construction could receive its endangered species permits by paying a single fee (and/or dedicating land), conducting limited surveys, and adhering to limited protocols to avoid and minimize impacts during construction. The fees would be collected by the Plan's Implementing Entity, combined with grants and other funding sources, and used to purchase habitat lands or easements from willing sellers. These funding sources would also pay for monitoring, habitat enhancement, and management for acquired lands.

Whether the project is able to go through the simpler HCP/NCCP process depends on the project alignment selected. Construction of the TriLink improvements might be considered a covered activity if the improvements are fully consistent with the HCP/NCCP requirements;

however, if inconsistent, construction could not be permitted through the HCP/NCCP and would be required to obtain a separate State and federal endangered species permit from United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).

4.4.2 East Alameda County Conservation Strategy

The purpose of the East Alameda County Conservation Strategy (EACCS) is to preserve endangered species by developing a shared vision for long-term habitat protection. The EACCS assesses areas all across East Alameda County for their conservation value and establishes guiding biological principles for conducting conservation in the county. Part of that guidance includes working with willing landowners to implement long-term conservation stewardship that would offset impacts from local land use, transportation, or other infrastructure projects.

Compliance with the EACCS is voluntary, but USFWS has issued a Biological Opinion for projects consistent with the EACCS. CDFW has not issued any State-level permits for the EACCS, but it is generally requiring projects to be consistent with EACCS as part of California Endangered Species Act (CESA) permitting.

The plan may be used to facilitate the permitting process through adherence with the EACCS standards, although the Strategy was mostly oriented to land use development and not large-scale transportation improvements; therefore, it is likely that UFSWS will require the project to go through a separate Section 7 Biological Opinion process and not use the previously issued Biological Opinion.

There are other recommendations in EACCS that will be reviewed when examining biological constraints in subsequent phases of the TriLink study.

4.4.3 San Joaquin Multi-Species Habitat Conservation and Open Space Plan

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) sets standards and measures to mitigate the cumulative impacts of new development on undeveloped lands within San Joaquin County. The establishment of preserve lands compensates for impacts to threatened, endangered, rare, and unlisted SJMSCP-covered species and other wildlife, and compensation for some nonwildlife-related impacts to recreation, agriculture, scenic values, and other beneficial open space uses. The SJMSCP includes widening of the existing Byron Highway to four lanes in its covered activities; therefore, any proposed improvements using the existing Byron Highway would likely be considered a covered activity under the SJMSCP. If an alignment were to depart from Byron

Highway in San Joaquin County, then this would not be a covered activity under the SJMSCP without an amendment. Alignments not consistent with the SJMSCP may be processed through a separate Federal Endangered Species Act (FESA) and CESA compliance process, but there may be agency concern in doing so.

4.5 SB 375 and Greenhouse Gas

Under current California state policy direction, as defined in SB 375 and other key legislation, any major new transportation investment will need to address a series of questions related to how the corridor elements support the State's sustainability goals. As part of the TriLink feasibility study, the Study Team has conducted a preliminary, high-level assessment of how the project supports the major sustainability goals.

The Ten-County Model was used to evaluate VMT and vehicle hours of delay (VHD) for four scenarios: the base year (2010), the base year plus the TriLink corridor elements, the future year (2040), and the future year plus the TriLink corridor elements. As discussed in Section 3.3, the base year (2010) scenario reflects a hypothetical situation if the TriLink project were implemented immediately. VMT is a total measure of automobile travel, reflecting the sum of mileage covered over a specific time period. VHD represents the aggregate excess travel time experienced by motorists.

VMT is the key indicator of the transportation and land use sector's greenhouse gas (GHG) emissions, and it is projected to rise significantly, absent strategies to counter the trend. To capture the full effects of the project, model runs were conducted to estimate how total regional VMT would change with and without TriLink in an area bounded by I-680 on the west, the Delta on the north, I-5 on the east, and I-205/580 on the south. As shown in Table 4.5-1, daily VMT is forecast to decrease by approximately 4 million vehicle miles of travel in 2040 with TriLink.

Table 4.5-1 Daily VMT within Regional Influence Area

Year	No Project (million)	With Project (million)	Change (million)
2010	82	81	1
2040	107	103	4

Source: Fehr & Peers, 2013.

In addition to VMT, VHD was calculated as the difference between congested travel time and uncongested travel time to determine congestion relief in area communities and the region. Measures that relieve congestion in one location also reduce delay elsewhere in the network because traffic is reduced on corridors to and from these areas. With TriLink, daily VHD in 2040 for the study area would be reduced by 57 percent.

An initial, high-level GHG assessment was conducted based on the VMT results from the four scenarios described above. The relationship between VMT and GHG is affected by the speed at which vehicle travel occurs. The following assumptions about speeds were made to facilitate the estimation of emission effects:

1. Free-flow speeds are assumed to occur throughout the 16 off-peak hours; those free-flow speeds are assumed to be 65 mph for freeways, 55 mph for expressways, 35 mph for arterials, 25 mph for collectors, and 20 mph for local streets.
2. During the 4-hour periods in both the AM and PM peaks, congested speeds on freeways, expressways, and arterials are assumed to be 25 percent slower than free-flow speeds. No congestion effects are assumed on facilities classified lower than major arterials.
3. No change in average fleet fuel economy is assumed between 2010 and 2040.

Using the above conservative assumptions, estimates of carbon dioxide (CO_2) emissions and fuel consumption were developed for the four scenarios based on the VMT results provided by the modeling team. As shown in Table 4.5-2, in 2040 with TriLink, annual CO_2 emissions decrease by approximately 400,000 metric tons, and 42 million gallons of fuel are saved.

Table 4.5-2 Regional GHG Assessment Results

Measure	2010		2040		
	No Project	With Project	No Project	With Project	Change
Metric Tons of CO_2 (Annual)	8 million	7.9 million	10.4 million	10 million	-400 thousand
Fuel Consumed (Annual Gallons)	910 million	898 million	1.19 billion	1.15 billion	-40 million

Source: Fehr & Peers, 2013.

Based on Sightline Institute's research (2007), constructing one lane-mile of highway and maintaining it for 50 years releases roughly 3,175 metric tons of CO_2. Based on the number of potential lanes, including transit, and the average segment lengths of the alignment options,

constructing and maintaining TriLink would result in 400,598 metric tons of CO_2. Therefore in 2040, TriLink would offset the emissions associated with construction and maintenance, just after the first full year of operation.

Chapter 5 Environmental Considerations and the Built Environment

This section summarizes the analysis conducted for environmental resources, planning policy, existing infrastructure, and future planned infrastructure for the proposed TriLink alignments.

5.1 Biological Resources and Planning Policy

A preliminary biological resources analysis of the proposed TriLink study alignments was conducted. Data from the California Natural Diversity Database (CNDDB) occurrences of rare[14] plant and animal species, National Wetlands Inventory (NWI), pertinent habitat conservation plans (EACCS, SJMSCP, and ECCC HCP/NCCP), Natural Resource Conservation Service soils data, and sensitive habitat and biological resources were evaluated to identify potential conflicts with respective alignments within the project corridor study area. Figure 5.1-1, located at the end of Section 5.1, shows the biological resources identified in the study area.

5.1.1 Species Occurrence and Sensitive Habitats

The preliminary biological resource analysis conducted for the TriLink study area[15] includes information on special-status wildlife and plant species and their approximate locations. Special-status plants are listed under State endangered or rare regulatory status and are categorized as California Rare Plant Ranks, which include rare or endangered in California and elsewhere, rare or endangered in California but more common elsewhere, or plants of limited

[14] "Rare" for the CNDDB is used broadly to include formally listed Federal and State species, candidate species, and other biological resources that are considered sensitive by CDFW, Bureau of Land Management (BLM), USFWS, and other agencies, as well as non-listed plant species considered to be rare by the California Native Plant Society (CNPS). The California Environmental Quality Act (CEQA) requires the assessment of impacts to all "rare" species whether they are formally listed under the Federal or State endangered species act or not and regardless of whether they are formally protected by other local, State, or Federal laws.

[15] Study area was based on a 5-mile buffer from the centerline of each proposed alignment.

distribution (not considered significant in the California Environmental Quality Act [CEQA]). Similarly, special-status wildlife is listed under federal threatened or endangered and State fully protected, species of special concern, threatened, or watch list regulatory status. The identified wildlife and plant species are listed in Table 5.1-1 and shown in Figures 5.1-2 and 5.1-3.

Table 5.1-1 Identified Wildlife and Plant Species in the Study Area

Special-Species Wildlife Species		Regulatory Status*	
		Federal	State
Invertebrates			
1	Curved-foot hygrotus diving beetle		
2	Midvalley fairy shrimp		
3	Vernal pool fairy shrimp	T	
Amphibians			
4	California red-legged frog	T	SSC
5	California tiger salamander	T	T
Reptiles			
6	Coast horned lizard		SSC
7	San Joaquin whipsnake		SSC
8	Western pond turtle		SSC
Birds			
9	Burrowing owl		SSC
10	California horned lark		WL
11	Ferruginous hawk		WL
12	Golden eagle		FP
13	Loggerhead shrike		SSC
14	Northern harrier		SSC
15	Swainson's hawk		T
16	Tricolored blackbird		SSC
17	White-tailed kite		FP
Mammals			
18	American badger		SSC
19	San Joaquin kit fox	E	T
20	San Joaquin pocket mouse		

Table 5.1-1 Identified Wildlife and Plant Species in the Study Area

Special-Species Plant Species		Regulatory Status*		
		Federal	State	California Rare Plant
1	Alkali milk vetch			1B
2	Big tarplant			1B
3	Brewer's western flax			1B
4	Brittlescale			1B
5	Caper-fruited tropidocarpum			1B
6	Chaparral ragwort			2
7	Delta button celery	E		1B
8	Delta mudwort			2
9	Diamond-petaled poppy			1B
10	Heartscale			1B
11	Mason's lilaeopsis	R		1B
12	Recurved larkspur			1B
13	Round-leaved filaree			1B
14	San Joaquin spearscale			1B
15	Shining navarretia			1B
16	Stinkbells			4
17	Woolly rose mallow			1B

*Indicates the following Regulatory Status

Federal / State

C	Candidate
D	Delisted
E	Endangered
FP	Fully Protected
R	Rare
SSC	Species of Special Concern
T	Threatened

California Rare Plant

1A	Presumed extinct in California
1B	Rare or endangered in California and elsewhere
2	Rare or endangered in California but more common elsewhere
3	Plant for which more information is needed (not considered significant in CEQA)
4	Plant of limited distribution (not considered significant in CEQA)

Most of the federally threatened and endangered, State threatened and endangered, State species of special concern, rare, or locally important species within the study area are in grassland and wetland habitat. There are occurrences of species in the croplands on the valley floor, but these are typically transient species such as Swainson's hawk (State threatened) and San Joaquin kit fox (federally endangered and State threatened) that forage in those areas.

The area around Byron Airport in Contra Costa County extending south just across the Alameda county line is a unique landscape of vernal pools,[16] alkaline wetlands,[17] and alkaline meadows[18] and scalds.[19] It supports several sensitive species, such as the vernal pool fairy shrimp (federally threatened), California tiger salamander (federally and State threatened), and California red-legged frog (federally threatened), as well as rare plants.[20] The area is a Core Recovery Area in the USFWS Vernal Pool Species Recovery Plan; therefore, USFWS is likely to require higher than typical mitigation ratios for impacts to the Core Recovery Area that are not mitigated within the same Core Recovery Area. There are documented occurrences of vernal pool fairy shrimp in pools throughout the region. The area west of Byron Airport is a high-priority conservation area in the ECCC HCP/NCCP largely because a long-term conservation goal specified within this plan is to create an upland habitat corridor for California red-legged frog and California tiger salamander from the cultivated valley floor into the grasslands of Altamont Pass. There are occurrence records for both species in wetlands and ponds throughout the region.

San Joaquin kit fox is known to occur throughout the region, with more than 30 records of observation in the Byron Hot Springs and Clifton Court Forebay, observed from 1973 to 2002 (CDFW, 2013). Based on the distribution of occurrences, it is assumed by USFWS and CDFW that San Joaquin kit fox move through the region on the low slopes between Altamont Pass and the Central Valley floor. Movement routes are likely circuitous as kit fox negotiate numerous water projects, conveyance canals, irrigation ditches, and roadways. Retaining movement routes for kit fox are highlighted as priorities in both the ECCC HCP/NCCP and the EACCS. Southeastern Contra Costa County and northeastern Alameda County are highlighted as high-priority conservation areas for this species in those plans. Construction outside of existing road alignments has the potential to further interrupt San Joaquin kit fox movement. New roadways along existing road alignments can also provide an opportunity to increase wildlife linkage permeability in a region if roadways are elevated or if proper-sized culverts are included in the project design.

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16 Vernal pools are areas that pond water on the surface for extended durations during winter and spring, and dry completely during late spring and summer. http://www.co.contra-costa.ca.us/depart/cd/water/hcp/archive/final_EIS/pdf/ch_3_affected_env.pdf. Accessed on May 31, 2013.

17 Alkali wetlands support ponded or saturated soil conditions and occur as perennial or seasonally wet features on alkali soils. (Alkali soils are clay soils with high pH (> 8.5), a poor soil structure and a low infiltration capacity. Often they have a hard calcareous layer at 0.5 to 1 meter depth.) http://www.co.contra-costa.ca.us/depart/cd/water/hcp/archive/final_EIS/pdf/ch_3_affected_env.pdf. Accessed on May 31, 2013.

18 Alkali meadows generally occur on alkaline soil units. http://www.co.contra-costa.ca.us/depart/cd/water/hcp/archive/final_EIS/pdf/ch_3_affected_env.pdf. Accessed on May 31, 2013.

19 Harsh alkaline conditions that are characterized by a salty crust that forms on the soil surface. http://creeksidescience.files.wordpress.com/2012/01/guidebook-to-the-bppas-of-the-east-bay-for-easy-download-smallest.pdf. Accessed on May 31, 2013.

20 In this case, “rare plants” means plants that are on the CNPS List 1 or 2. Some of these plants are federally or State listed; many are not. All are considered “rare” for the purposes of CEQA; therefore, they would need to be analyzed in the CEQA document for the project.

There are more than 50 records of burrowing owl throughout the region observed from 1989 to 2009, with many occurrences in the last 5 years. There are two burrowing owl conservation banks in the study area and many other areas where burrowing owls have been documented breeding in the recent past.

In addition to the wildlife species, there are several rare plant species associated with alkaline meadow and scald, alkali wetland, and vernal pool habitats. The alkaline habitats in the region have been surveyed often for species presence. The most important plant to note is the recurved larkspur. This plant only occurs in areas around Byron Airport and in the pockets of alkali-associated habitat types in Alameda County. The plant is more common in the southern San Joaquin Valley, but this isolated population is extremely limited in distribution; therefore, it is considered highly sensitive.

Alkaline soils are not a regulated sensitive resource in themselves; however, nutrient-poor soils have the potential to support a variety of endemic (i.e., occur in no other habitat) plants and animals, as well as unique land cover types such as alkaline wetlands and alkaline grasslands. The natural rarity of alkaline soils, combined with habitat loss and declines in the populations of alkali endemic species, have contributed to the sensitivity of the endemic species found in the area, many of which are protected by Federal and State regulations. All four potential corridor elements and their alignment options would impact alkaline soils.

5.1.2 Waters, Wetlands, and Riparian Habitat

Portions of all of the alignments encroach on federally designated Critical Habitat for vernal pool ecosystems. One segment of the corridor element would cross through alkaline wetlands near Bruns Road. Other segments in the corridor would impact alkaline wetlands near Byron Airport. Segments also would cross areas of human-made canals, wetlands, and discontinuous riparian habitat, but efforts were made to have each alignment avoid alkaline wetlands and meadows.

A wetland delineation would be conducted and a report prepared to document the extent of wetlands and waters of the U.S., which fall under jurisdiction of the United States Army Corps of Engineers (USACE) (Section 404 of the Clean Water Act), as well as waters of the State, which fall under jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB) (under the Porter Cologne Water Quality Control Act), and streams and riparian habitat, which are under jurisdiction of CDFW (per Section 1600 of the California Fish and Game Code). The delineation would need to be submitted to USACE for verification to receive a jurisdictional determination, which would determine the extent of Federal jurisdictional waters that would be impacted by the selected alignment. The State agencies would also need to concur with the delineation of their jurisdiction. Impacts to wetlands/waters of the U.S. and the State would

need to be mitigated (likely at a minimum 2:1 ratio and possibly more), monitored per a plan that would need to be developed, and subject to Federal and State agency approval.

5.1.3 Existing Mitigation/Conservation Areas

There are many areas that have been acquired for mitigation or conservation purposes within the study area. A particular focus of prior conservation has been in the area north and west of Byron Airport. Previously conserved areas include a combination of private mitigation holdings, private mitigation banks, and public mitigation lands. Additional research is necessary to confirm all conservation lands along the project alignments.

- In Contra Costa County, there is reportedly a Burrowing Owl Conservation Bank north of Byron Airport. There are also reportedly conservation lands on both sides of Armstrong Road. Alignments around the airport may require the conversion of some of those mitigation lands.
- The ECCC Habitat Conservancy (Conservancy) has acquired several parcels west of Byron Airport to partially fulfill its obligations under the ECCC HCP/NCCP. Those lands were purchased with a combination of HCP fees and grant monies, and they are held by the East Bay Regional Parks District. Several of these lands are bisected with select alignments. Alignments along and near Armstrong Road would result in the loss of protected open space land associated with the Los Vaqueros Reservoir.
- In Alameda County, there are several private mitigation holdings, including an area reportedly preserved as Mitigation by Pacific Gas and Electric Company (PG&E), but they may not be directly impacted by certain alignments.

5.1.4 Potential Future Protected Areas

Aside from existing protected areas, the ECCC HCP/NCCP and the EACCS have identified lands for future conservation priority. In Contra Costa County, there is a block of high-priority conservation area west and south of Byron Airport. Those lands have been identified to protect the upland habitat corridor for California red-legged frog and California tiger salamander, as previously discussed. The ECCC HCP/NCCP also has obligations to protect and restore wetlands and riparian areas. Many of those future restoration efforts will be completed in the southeastern part of the county.

The EACCS has identified high conservation priority areas due to their rarity. Conservation priorities include protection of known occurrences of San Joaquin spearscale and recurved larkspur and surveys of other potential habitat; enhancement and creation of additional linkages across existing water conveyance infrastructure; protection of alkaline meadow and scalds, which will provide protection of habitat for San Joaquin spearscale, recurved larkspur,

longhorn shrimp, and vernal pool fairy shrimp; and protection of critical habitat for California red-legged frog. Some alignments cross through an alkaline scald/meadow/wetland area east of Bruns Road that is a high priority for conservation due to the presence of several sensitive species and the rarity of this habitat.

5.1.5 Expected Future Impact Assessments and Determinations

Special-Status Plants

Two preconstruction surveys, over two blooming seasons, for each species with potential to occur in the impact area of the selected alignment are expected to be necessary to further determine the presence or absence of each rare plant species to support CEQA and the National Environmental Policy Act (NEPA) evaluation and project permitting. Should special-status plant species be found within the impact area of the selected alignment, they would need to be avoided or relocated to suitable preserved habitat. If relocation would occur, then a monitoring plan with success criteria would need to be developed and implemented.

Special-Status Animals

Due to the presence of habitat and occurrences, impacts would need to be avoided, minimized, mitigated and/or compensated for per CEQA, NEPA, FESA, and CESA requirements. Known wildlife species with habitat throughout the region that are expected to occur include vernal pool fairy shrimp, California red-legged frog, San Joaquin kit fox, burrowing owl, Swainson's hawk, and nesting migratory birds. Potential impacts to these species may occur regardless of the selected alignment. Some degree of California red-legged frog habitat, burrowing owl habitat, Swainson's hawk foraging habitat, and San Joaquin kit fox habitat preservation, compensation, and/or restoration is ultimately expected to be necessary, regardless of the selected alignment. Portions of all alignments encroach on federally designated Critical Habitat for vernal pool fairy shrimp and Contra Costa goldfields. Potential impacts to species movement will be considered when siting and designing any roadway in either of these corridor elements. Roadways will be designed to accommodate wildlife movement by incorporating elevated sections or wildlife undercrossing. Additionally, a preconstruction nesting migratory bird survey will be conducted to ensure the avoidance of active nests should construction associated with the TriLink facility commence during the nesting season (February 1 through August 31).

5.1.6 Habitat Conservation Plans and Conservation Strategies

Construction of the TriLink facility might be considered a covered activity if the facility is fully consistent with these HCPs and conservation strategies within the study area. These include the ECCC HCP/NCCP, SJMSCP, and EACCS.

5.1.6.1 East Contra Costa County HCP/NCCP

Below are some preliminary findings about the proposed alignments and the ECCC HCP/NCCP:

- The HCP/NCCP anticipates that the SR 239 project would consist of the expansion of Byron Highway to a multi-lane freeway somewhere within the 1,500-foot-wide corridor around the existing highway. The HCP/NCCP describes that a new alignment could be constructed between Byron Highway west to the existing railroad tracks, which are approximately 80 feet from the center of the highway, or farther east near the community of Discovery Bay. The HCP/NCCP also includes high-priority conservation areas west and south of Byron Airport.
- Some alignments would not be a covered activity under the current HCP/NCCP because it is not in the area described for SR 239 in the plan and because it would cut across an area of high conservation priority for the ECCC HCP/NCCP, including some existing conservation land acquired through HCP/NCCP implementation. These alignments could be included in the HCP/NCCP as an amendment, if agreed to by USFWS and CDFW, as this amendment would require a change in the conservation strategy for this part of the County.
- Other alignments would not be a covered activity under the current HCP/NCCP because it is mostly located west of the railroad and is not located within the 1,500-foot-wide corridor of the existing Byron Highway. These alignments may also affect priority conservation areas south of Byron Airport and vernal pools or alkaline wetlands in this area.
- There are some alignments compatible with the HCP/NCCP goals in this area as they avoid impacts to high-priority conservation and minimize potential impacts to vernal pools and alkaline wetlands; however, for this to be a covered activity, it would require an amendment of the HCP/NCCP agreed to by USFWS and CDFW.
- Any alignment along Armstrong Road could be a covered activity under the current HCP/NCCP if it complied with specific design requirements. These include an elevated viaduct design, wildlife crossings, minimum sizing for culverts, fencing designs, or median designs for wildlife, and other requirements to minimize effects on habitat and hydraulic connections in an area containing existing preservation lands. The HCP/NCCP notes that an alignment north of Byron Hot Springs might require many of these design elements, but the HCP/NCCP currently only mandates their use for an alignment south of Byron Hot Springs.

5.1.6.2 San Joaquin County MSCP

An alignment along Byron Road would likely be considered a covered activity under the SJMSCP. This is the only alignment that is partially within San Joaquin County.

Figure 5.1-1: Biological Resources

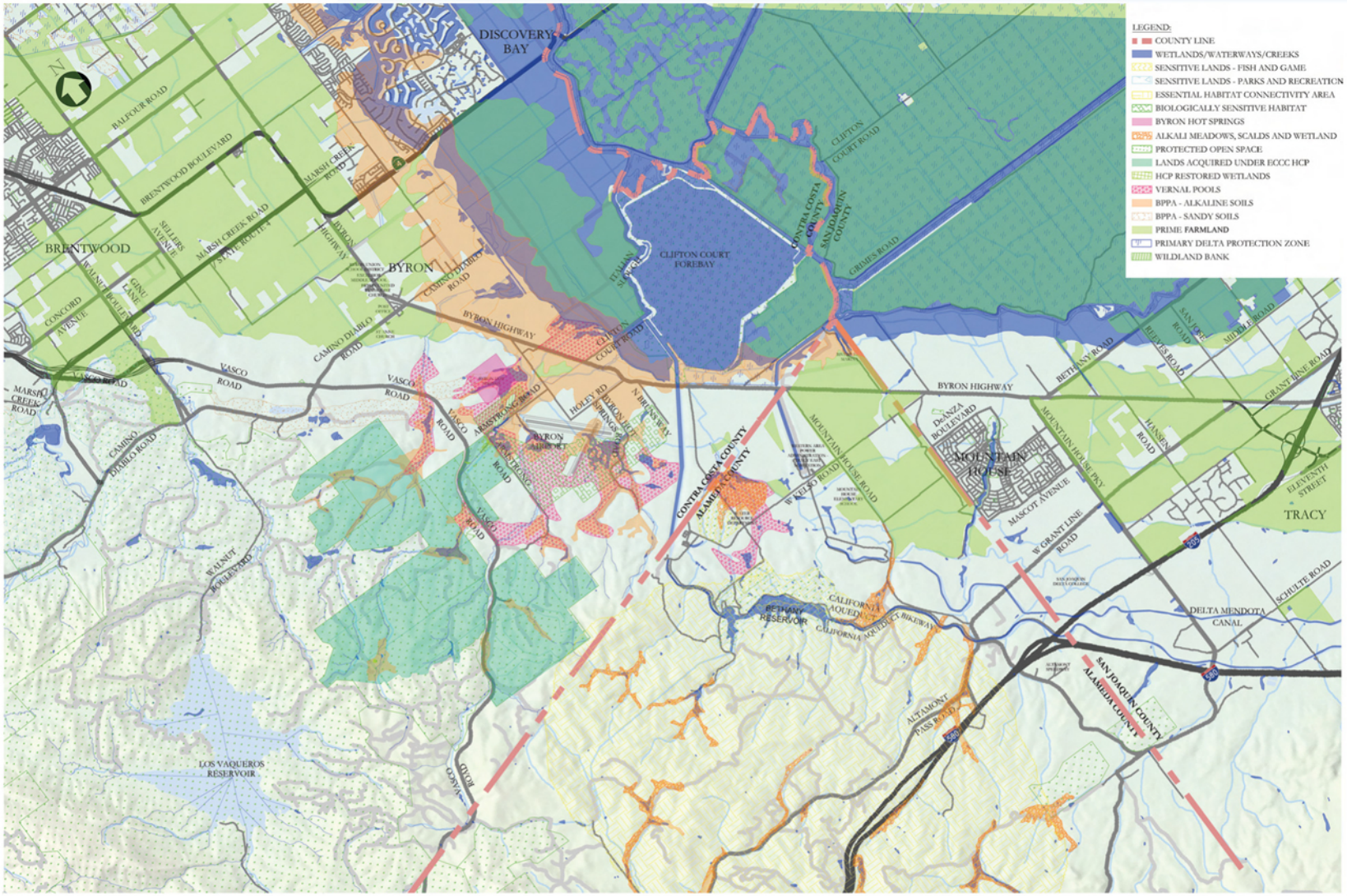

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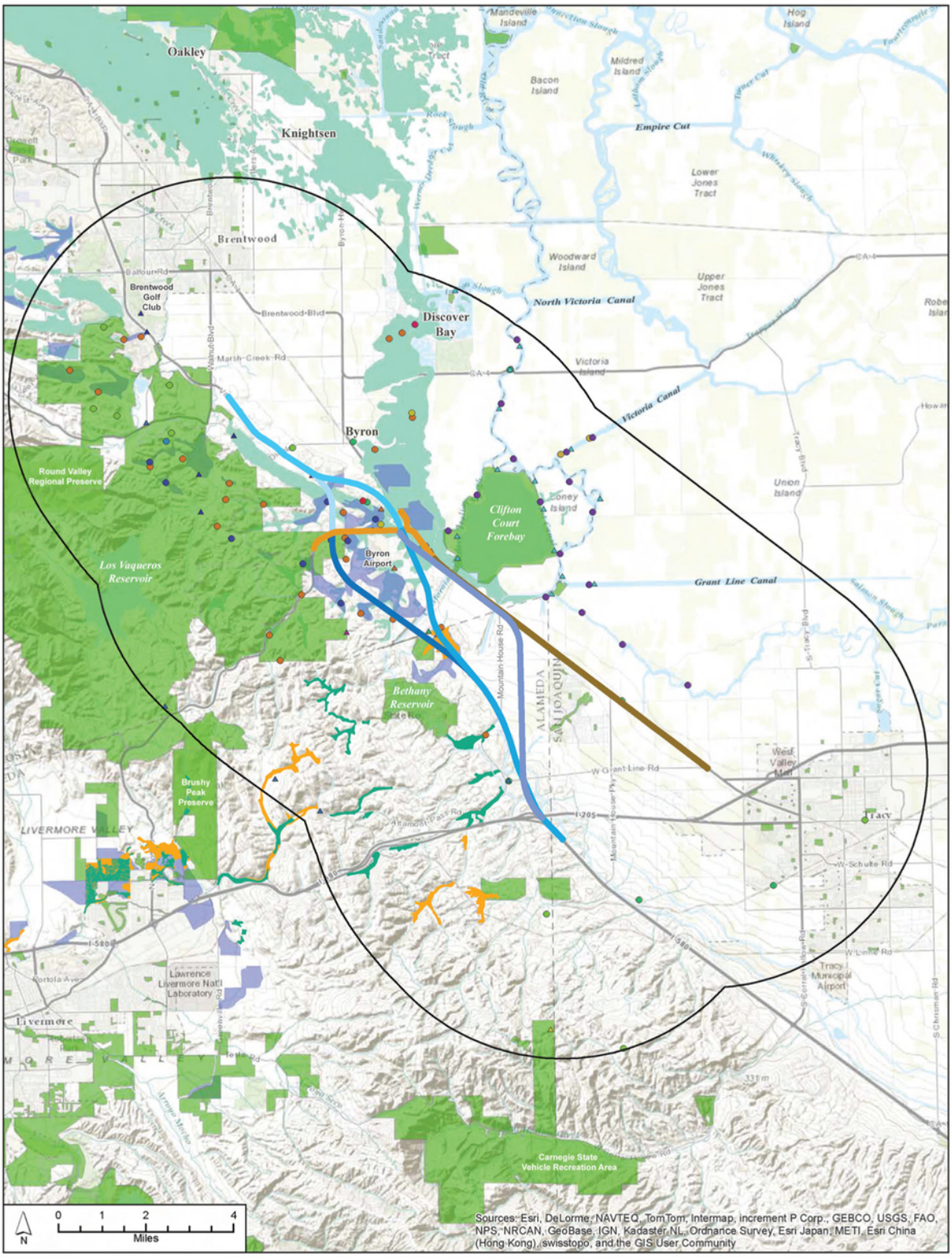
Figure 5.1-2: TriLink CNDDB Plant Occurrences in a 5-Mile Radius of the Study Area



Legend

CNDDB Plant Occurences
- Brewer's western flax
- Delta button-celery
- Delta mudwort
- Mason's lilaeopsis
- San Joaquin spearscale
- alkali milk-vetch
- big tarplant
- brittlescale
- caper-fruited tropidocarpum
- chaparral ragwort
- diamond-petaled California poppy
- heartscale
- recurved larkspur
- round-leaved filaree
- shining navarretia
- stinkbells
- woolly rose-mallow

SR 239 Alignments
- Airport Connector
- South Link
- North Link Option 1
- North Link Option 2
- I-580 Link Option 1
- I-580 Link Option 2a
- I-580 Link Option 2b

- 5-Mile Radius
- Alkali Meadow and Scalds
- Alkalli Wetland
- Protected Open Space
- Holland Vernal Pools
- Alkaline Soils
- NWI - Wetlands

Source: SR 239 Alignments, Parsons; CNDDB, CDFG; Protected Open Space, CPAD 1.8 and East Alameda Open Space; NWI, USFWS; Land Cover, ICF; Alkaline Soils, Parsons.

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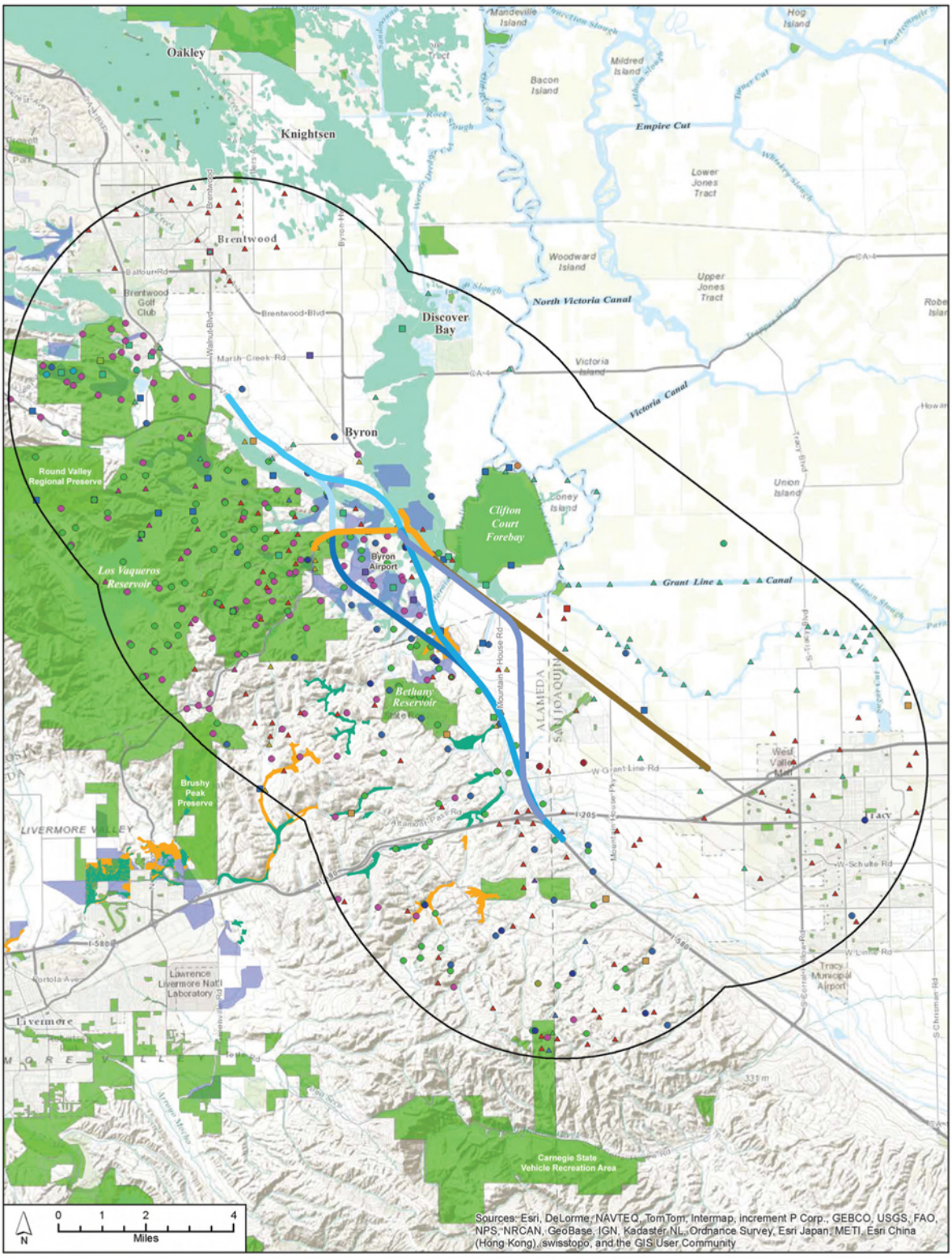
Figure 5.1-3: TriLink CNDDB Animal Occurrences in a 5-Mile Radius of the Study Area



Legend

CNDDB Animal Occurrences

- Alameda whipsnake
- American badger
- California horned lark
- California linderiella
- California red-legged frog
- California tiger salamander
- Delta smelt
- San Joaquin kit fox
- San Joaquin pocket mouse
- San Joaquin whipsnake
- Swainson's hawk
- burrowing owl
- coast horned lizard
- curved-foot hygrotus diving beetle
- ferruginous hawk
- golden eagle
- loggerhead shrike
- longhorn fairy shrimp
- midvalley fairy shrimp
- molestan blister beetle
- northern harrier
- prairie falcon
- silvery legless lizard
- tricolored blackbird
- vernal pool fairy shrimp
- western pond turtle
- white-tailed kite

SR 239 Alignments

- Airport Connector
- South Link
- North Link Option 1
- North Link Option 2
- I-580 Link Option 1
- I-580 Link Option 2a
- I-580 Link Option 2b

- 5-Mile Radius
- Protected Open Space
- Alkali Meadow and Scalds
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Source: SR 239 Alignments, Parsons; CNDDB, CDFG; Protected Open Space, CPAD 1.8 and East Alameda Open Space; NWI, USFWS; Land Cover, ICF; Alkaline Soils, Parsons.

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5.1.6.3 East Alameda County Conservation Strategy

Alignments that would cross priority alkaline meadows and wetlands along Bruns Road in Alameda County could be in conflict with the conservation priorities of the EACCS, depending on the type, size, and location of impacts.

More details on the biological resources within the TriLink study vicinity can be reviewed in Chapter 7, Comparison of Corridor Elements.

5.2 Water Resources

The TriLink alignments would cross many creeks, aqueducts, canals, and ditches, depending on the alignment chosen. The United States Geological Survey (USGS) topographic map identifies multiple named and unnamed water bodies within the TriLink study vicinity; the named water bodies include Kellogg Creek, Brushy Creek, Old Creek, and Mountain House Creek. The crossings of note for all alignments include the following:

- California Aqueduct
- Delta Mendota Canal
- Local aqueducts, irrigation canals, and ditches

In addition to the creek crossings, additional water bodies, such as the Clifton Court Forebay, Italian Slough, and Old River in the study vicinity, may be directly impacted due to the proposed roadway and bridge construction.

For alignments that cross waterways, there were two options – go around or go over. In many cases, the simpler solution was bridging over the water features, and this was evaluated for canals and aqueducts. For larger bodies of water, such as the Clifton Court Forebay, bridging is impractical and would be tremendously expensive, so this option was not evaluated. In general, water crossings were avoided if possible to minimize cost and potential environmental impacts.

5.2.1 Watersheds

Most of the study area is within an undefined planning watershed in the San Joaquin Delta and an undefined planning watershed in the North Diablo Range. In addition, a small portion in the southern area is within the Carbona planning watershed in west San Joaquin County. Per Caltrans' "Construction General Permit Info" Geographic Information System (GIS) mapping system, the study area is not within any risk watershed. In general, the projects would be designed to maintain the existing drainage patterns to the maximum extent practicable. Each

alignment would address the stormwater runoff from the proposed roadway construction by implementing outlet protection and roadside ditches.

5.2.2 Drainage

In the design phase, the drainage design for the alignments would be based on procedures presented in the sixth edition of the Highway Design Manual (HDM) from Caltrans (2006) and the Hydraulic Engineering Circular Number 22 (HEC-22) Urban Drainage Design Manual from the Federal Highway Administration (FHWA) (2009). For any frontage or service road relinquished to local agencies, the drainage design would conform to local requirements.

In general, the alignments would be designed to maintain the existing drainage patterns to the maximum extent practicable. Alignments would address the stormwater runoff from the proposed roadway construction through infiltration, retention, or evapotranspiration.

5.3 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for Contra Costa County and Incorporated Areas (2009) and the FEMA FIS for San Joaquin County and Incorporated Areas (2009) show that there are delineated floodplains associated with several streams that are potentially affected by the proposed alignments.

Various areas of the proposed alignments would go through Zone A floodplains[21], from north to south, including Brushy Creek and California Aqueduct; Unnamed Creek 2, a tributary to Italian Slough, Brushy Creek, a tributary to Brushy Creek, California Aqueduct, and an unnamed canal to Clifton Court Forebay; and several locations near Brushy Creek, a tributary to Brushy Creek, California Aqueduct, and an unnamed canal to Clifton Court Forebay near Byron Highway.

The City of Tracy Citywide Storm Drainage Master Plan (2012) categorizes Old River as part of the San Joaquin River system of interconnected waterways that interact with the Delta area. Old River is contained by levees and, in the event of a levee failure, there are northern portions of the study area mostly north of I-205 that would be subjected to flooding according to Flood Insurance Rate Maps (FIRMs) published by FEMA.[22]

[21] Zone A floodplains are those areas with a 1 percent annual chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage.

[22] Federal Emergency Management Agency, 2009 (Map No. 06013C0365F, 06013C0370F, 06013C0525F, 06013C0530F, and 06013C0540F for areas in Contra Costa County, and Map No. 06077C0570F, 06077C0590F, and 06077C0725F for areas in San Joaquin County).

The FHWA floodplain policies and regulations (23 *Code of Federal Regulations* 650 Subpart A) attempt to keep encroachments (i.e., embankments) entirely out of floodplains. Because the alignments are proposed to be constructed at grade, the impact to floodplains may be lessened.

A Location Hydraulic Study should be conducted in the Project Approval/Environmental Document (PA/ED) phase to determine whether any of the proposed corridor elements includes an encroachment on the base floodplain. A map revision is required when construction in the floodplain increases the base flood elevation by more than 1 foot.

5.4 Water Quality

All of the proposed TriLink alignments are within the CVRWQCB, Region 5, and jurisdictional area. The 2010 State Water Resources Control Board 303(d) list for Water Quality Segments identifies three creeks as impaired water bodies in the study area. These three impaired water bodies are listed below:

1. Kellogg Creek (Los Vaqueros Reservoir to Discovery Bay; partly in Delta waterways, western portion);
2. Mountain House Creek (from Altamont Pass to Old River, Alameda and San Joaquin counties; partly in Delta waterways, southern portion); and
3. Old Creek (San Joaquin River to Delta-Mendota Canal; in Delta waterways, southern portion).

Based on the basin plan for the Central Valley region (CVRWQCB, 2011), the California Aqueduct and Delta Mendota within the study area are identified as having existing beneficial uses. The study area, however, is not within any State Water Quality Protection Areas of Special Biological Significance and is not within any coastal zones as defined by Caltrans; therefore, it should not have any impacts from tides or waves.

Potential water quality impacts may occur at the creek crossings and the biotic/aquatic or wetland areas adjacent to creek crossings that are parallel to the study area. The regulatory requirements, permits, and local guidelines for the proposed TriLink improvements, as well as the preliminary avoidance, minimization, and/or mitigation measures, have been reviewed.

5.5 Geology

According to the geotechnical and geologic constraints evaluation, no known geologic hazards are in the study area that would preclude the proposed development of the TriLink alignments. The primary geotechnical and geologic concerns are the presence of potentially highly

expansive soils, the possibility of adverse bedding in the roadway cut slopes, possible impacts of active landsliding to the proposed alignments, and exposure to strong ground shaking from nearby faults. These geologic concerns are discussed below.

5.5.1 Soils

The soils within the study area are typically clay to clay loam with medium to high plasticity. A detailed map and explanation of the study area soils are presented in the Geotechnical and Geologic Constraints Evaluation (2013). The United States Department of Agriculture (USDA) soil mapping identifies locations with limitations, including high shrink-swell potential and relatively low soil strength. Other limitations include slopes that exceed 15 percent and rare occasional flooding.

5.5.2 Groundwater

A review of the California Data Resources Water Data indicates that groundwater in the northern portion of the proposed alignment is approximately 10 to 20 feet below the ground surface along the flat portions of the alignment near the existing Byron Highway. Recent water well data was not available for the southern and eastern portions of the proposed alignments; however, the Mountain House development data indicate that groundwater can be as shallow as 5 feet below the ground surface. The depths to groundwater observed for this study will be used for preliminary consideration only. In addition, the groundwater elevation may fluctuate due to seasonal variation in rainfall, irrigation, tidal action, pumping rates, or other factors not evident at the time of exploration.

5.5.3 Landslides

Mapping by Atwater (1982) does not show landslide deposits within the proposed alignments, and signs of significant landsliding were not observed from aerial photo or topographic and geologic mapping review; however, given that portions of the site are bordered by or directly across significant hillsides (particularly in the western portion of the proposed alignments), the potential for landsliding should be further evaluated during a design-level geotechnical exploration.

5.5.4 Seismicity and Faulting

The study area is located in an area of moderate seismicity. There are no known surface expressions of active faults that cross the study area; however, large earthquakes have historically occurred in the area, so the project would be designed to accommodate strong

earthquake ground shaking. These geologic hazards will be further considered and evaluated during the design-level geotechnical and geologic study.

5.6 Cultural Resources

The Study Team conducted a preliminary archaeological and architectural resources analysis of the proposed TriLink study alignments. The analysis included a review of data from the Northwest Information Center; Central California Information Center (CCIC); the San Joaquin, Alameda and Contra Costa County Assessor parcel information through Google Earth Pro; and a windshield reconnaissance survey of built environmental sites.

The windshield survey was limited to views from the public ROW of often large agricultural properties and limited by a lack of access where no current roads exist. General sensitivity for buried cultural resources was also considered by assessing soil information and landscape features. The footprint of the proposed alignments was assumed to be approximately 200 feet in width, and the study area is based on an approximately 0.25-mile buffer from the centerline of each proposed alignment.

The preliminary research and windshield reconnaissance survey indicate that there are sensitivities for prehistoric archaeological deposits, potentially impacting one recorded archaeological site that is eligible for listing in the National Register of Historic Places (NRHP). There is one alignment potentially impacting two additional properties more than 45 years old. In addition, this alignment would also be within 0.25-mile of the Byron Hot Springs, which is potentially eligible for NRHP listing.

Two archaeological resources were identified within the footprint of an alignment near Byron Airport; however, these resources have not been evaluated for listing in the NRHP/California Register of Historic Resources (CRHR). In addition, there is one potential historic built resource in the area of the airport; however, it is not eligible for the NRHP or CRHR.

There are two alignments that appear to cross many of the same concentrations of large agricultural properties, many of which include buildings more than 45 years of age, as well as the Delta Mendota Canal, which has been previously found to be eligible for the NRHP. One alignment footprint would cross one potentially eligible NRHP property (Assessor's Parcel Number [APN] 110110286), as determined through the windshield survey, and it would contain one prerecorded archaeological resource, with another prerecorded resource within 0.25-mile of the proposed alignment. It appears a proposed second option to that alignment would not

cross any prerecorded archaeological resources; however, it would potentially cross within 0.25-mile of an additional five recorded properties compared with other options.

The proposed alignments near Byron Highway have the potential to contain the most concentrated number of prerecorded and potential historic built resources among any of the proposed alignments; therefore, they would require the greatest amount of effort in recording and documenting potential cultural resource impacts. However, most of these resources, with the exception of two that were found to be eligible for the NRHP, are within the 0.25-mile buffer of the project area and may not present a high potential for adverse effects to these resources from the proposed project. The properties within this footprint that are over the age of 45 years old have been determined not to appear eligible for the NRHP under Criterion C or CRHR under Criterion 3 through the windshield survey.

5.7 Existing Infrastructure

The TriLink study area contains the following existing infrastructure:

- Power distribution and transmission lines/poles/electrical facilities
- Clifton Court Forebay
- Solar farms
- Wind resource area
- Byron Airport
- UPRR Mococo Line
- Delta-Mendota Canal and California Aqueduct
- East Bay Municipal Utility District (EBMUD) pipelines
- Kinder Morgan products pipeline
- PG&E natural gas transmission pipelines

The Western Area Power Administration operates the roughly 70-acre Tracy East Substation at the northwest corner of Mountain House Road and Kelso Road. Power poles carrying overhead power lines run north/south from this facility to either side of the Clifton Court Forebay in the north and just west of Tracy in the south. Any conflict with existing power lines/poles would require relocation.

There are proposed alignments that have the potential to affect access to existing and proposed solar farms in south Alameda County. Greenvolts 3MW Solar Energy Facility is an existing site with approximately 20 acres of land across the road from a PG&E substation, approximately 0.33-mile west of Mountain House Road and on the south side of Kelso Road

(Alameda County Planning Department, 2010). In addition to the solar farms, the hills of northeast Alameda County north of I-580 are covered with wind turbines.

Nearly 55,000 acres of hilly land in the tri-county area are identified as a wind resource area. The National Renewable Energy Laboratory has mapped the extent of renewable wind resources across the United States.[23] Although individual wind turbines could be relocated due to conflicting alignments, design strategies should try to minimize the impact through this area.

Byron is home to the county-owned public-use Byron Airport. The airport is located roughly 2 miles south of the central business district of Byron along Armstrong Road and covers an area of 1,421 acres, containing two asphalt runways.[24] According to the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems, Byron Airport is categorized as a reliever airport.[25] In addition to the airport buildings and hangers that house 130 aircraft, the airport has 4 areas at the ends of the runways totaling roughly 149 acres as Runway Protection Zone (RPZ), as well as a 16.5-foot clearance zone around runways (Byron Airport, 2005). The RPZ is defined as a trapezoidal-shaped area off the runway end to enhance the protection of people and property on the ground. This is achieved through airport owner control over the RPZ area including, but not limited to, clearing (and maintaining clear) areas of incompatible objects and activities. The FAA provides guidance on construction within the RPZ.

UPRR's Mococo rail line runs immediately east of the existing Byron Highway from Tracy to Holly Road (just west of Clifton Court Forebay and east of Byron Airport), at which point there is an at-grade crossing of Byron Highway. The Mococo line continues to the west side of Byron Highway through Byron and into Brentwood. The TriLink alignment development must accommodate the continued operation of the Mococo line.

The Delta-Mendota Canal runs parallel to the California Aqueduct for most of its journey within the study area. The California Aqueduct is a system of canals, tunnels, and pipelines that conveys water collected from the Sierra Nevada Mountains and valleys of northern and central California to southern California. The Department of Water Resources (DWR) operates and maintains the California Aqueduct. Water flows down long meandering concrete-lined canal segments that are built at a slight grade and have a typical section of 40 feet at the base and an average water depth of approximately 30 feet. At points of intersection with the TriLink facility,

[23] "Ca_50mwind." *National Renewable Energy Laboratory*. Web. 23 April 2013. <http://www.nrel.gov/gis/cfm/data/GIS_Data_Technology_Specific/United_States/Wind/metadata/ca_50m_metadata.htm#1>.

[24] FAA Airport Master Record for C83, effective 2007-10-25.

[25] FAA National Plan of Integrated Airport Systems: 2007-2011.

these canals will be bridged with standard roadway overcrossings and abutments, footings, and piles designed to avoid affecting these conveyance systems.

The EBMUD has two water pipelines in the study area. The Old River Pipeline runs south of SR 4, from the Old River in the east, passing north of Byron, and ends approximately just south of the intersection between Camino Diablo Road and Walnut Boulevard. At this location, the Old River Pipeline connects to the Los Vaqueros Pipeline, which runs to the north from the Los Vaqueros Reservoir, approximately following the path of Walnut Boulevard, Vasco Road, and the SR 4 Bypass. The TriLink alignment development must consider these pipelines when determining interchange and grade separate locations to avoid conflicts with abutments, footings, and piles, in particular at the locations of Walnut Boulevard and Vasco Road, and Marsh Creek Road and Vasco Road.

Kinder Morgan has a pipeline running through the study area, from Richmond to Fresno via Concord. This type of pipeline is typically used to transport various fuels, including gasoline, jet fuel, diesel fuel, and natural gas. The pipeline is within the UPRR easement on the edge of the project area, and it will need to be taken into account when planning any potential grade separations over the UPRR Mococo Line and any potential transit improvements within the existing UPRR easement.

PG&E has several natural gas transmission pipelines within the study area. Line 002 runs from just west of the interchange between I-205 and Mountain House Parkway to the northwest toward Byron Airport, running along the edge of the hilly terrain. The line crosses the California Aqueduct and passes through the Byron Airport ROW. West of the Byron Hot Springs, Line 002 crosses Vasco Road and continues northwest approximately parallel to Vasco Road on the west. Line 401 connects to Line 002 just north of the California Aqueduct and continues northeast along the aqueduct before heading north along Byron Hot Springs Road on the eastern border of the Byron Airport. The pipeline turns to the east and crosses Byron Highway just north of the at-grade crossing of Byron Highway and the UPRR rail line, near the intersection of Byron Highway and Clifton Court Road, before turning north and passing east of Byron.

The TriLink alignment will consider these pipelines when determining interchange and grade separate locations to avoid potential conflicts with abutments, footings, and piles. In particular, the alignment crossing of the California Aqueduct, the interchange with the Airport Connector and the I-580 Link (Options 2a and 2b), the interchange or grade separation between the North Link and Camino Diablo Road, and the interchange between the North Link and March Creek Road will consider these pipelines.

5.8 Planned Infrastructure

In addition to the existing infrastructure within the TriLink study area, additional planned solar farms, as well as planned development communities, were noted.

The Cool Earth solar farm is a proposed project located south of Kelso Road and west of Patterson Park Road, between Tracy and Byron in unincorporated Alameda County. The 140-acre project site is located on a 146.49-acre parcel (APN 099B-7175-5-4 and 099B-7175-005-01), owned by Steve Haney (mailing address: 17499 Kelso Road, Byron, CA). The project site would be leased by Cool Earth Solar, Inc., for a duration of 30 years, and the site would be returned to its original condition by Cool Earth Solar, Inc., upon lease termination (Alameda County Planning Department, 2011).

Part of the TriLink design development includes improving regional connectivity and promoting future growth for planned communities. The City of Tracy and the Mountain House CSD have produced general plans for their planned growth. The purpose of a general plan is to express the broad goals and policies, and specific implementation measures that will guide decisions on future growth, development, and the conservation of resources through the year for a set time period. Each city and county adopts and updates its general plan to guide the growth and land development of their community for the current period and long term. The general plan is the foundation for establishing goals, purposes, zoning, and activities on each land parcel to provide compatibility and continuity to the entire region, as well as each individual neighborhood. The general plans for the City of Tracy and the Mountain House CSD were incorporated into the TriLink alignment study.

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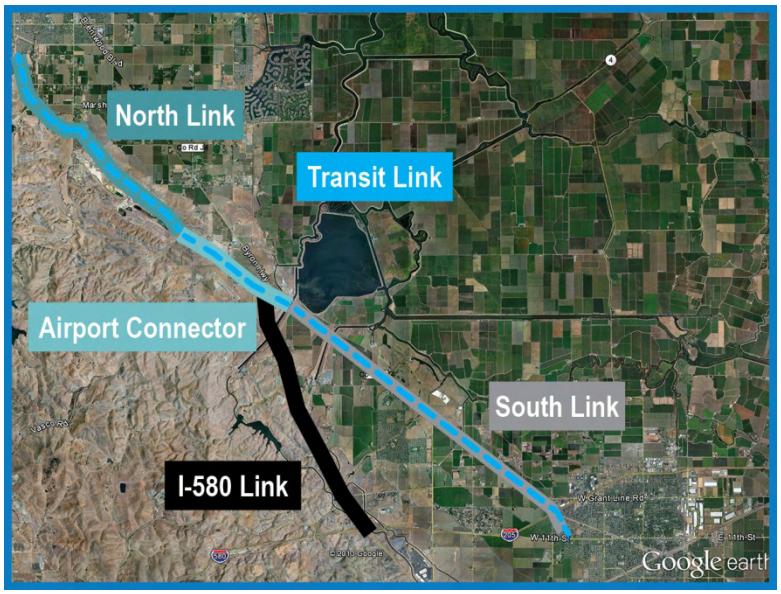


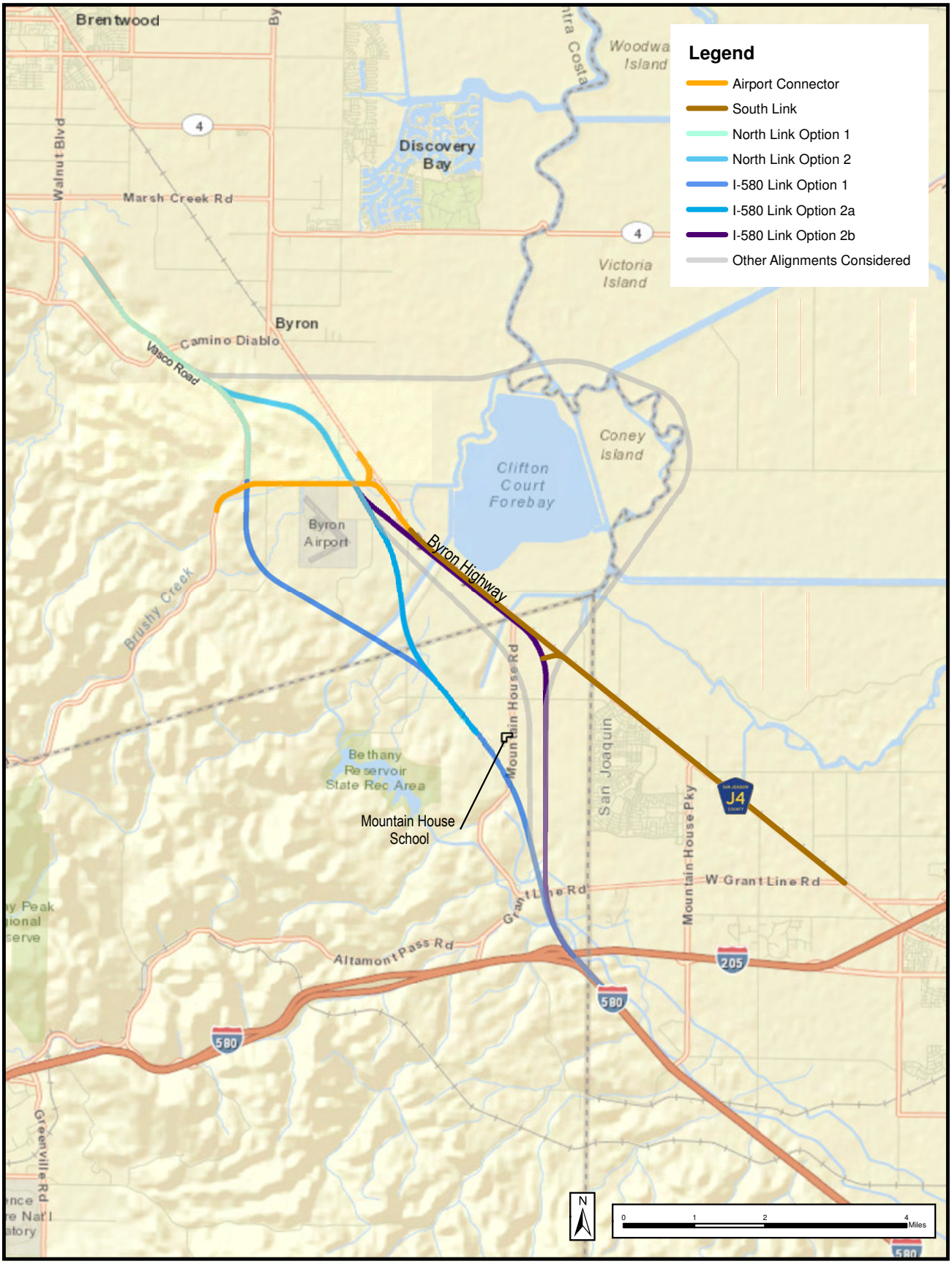
Chapter 6
Corridor Elements

There are five corridor elements in the TriLink program of improvements that were studied as potential connections between Brentwood and Tracy. These five corridor elements include the Airport Connector, South Link, North Link, I-580 Link, and a Transit Link. Each corridor element has its own function and, aside from the I-580 Link, independent utility, and therefore the ability to be constructed independently. The Airport Connector and South Link would provide improvements to existing infrastructure and support local connectivity and mobility. These corridor elements would primarily serve the need for people movement within the study area, as well as provide better access to existing and planned infrastructure and development. The North Link and I-580 Link together comprise a freeway connection between SR 4 in Brentwood and the I-580/I-205 interchange west of Tracy. These elements would facilitate goods movement into, out of, and within the study area, and they would provide better access to existing and planned infrastructure and development.

Various alignment options were developed for each corridor element. The goals during development of the alignments included using existing transportation infrastructure and ROW, providing direct connections to provide efficient solutions and reduce VMT, minimizing the impact to existing non-transportation infrastructure and facilities, and avoiding impacts to various planning considerations, in particular planning considerations without mitigation opportunities.

The Airport Connector and South Link are proposed improvements of existing facilities; one alignment was studied for each of these two corridor elements. Three alignment options were developed for the North Link corridor element and five were studied for the I-580 Link. These alignments can be seen in Figure 6.0-1.

Figure 6.0-1: Corridor Elements and Alignments Considered



Airport Connector and South Link

The Airport Connector and South Link generally would involve improvements to existing surface streets. Future alignments for these two corridor elements therefore would follow the centerline of the existing facilities. The connection points for the Airport Connector, to Vasco Road at the west end, and to Byron Highway in the east, will be developed in greater detail in subsequent stages of project development. The South Link would involve some new ROW to account for a wider alignment (four lanes plus provisions for pedestrian/bicycle use) and to allow the elimination of at-grade railroad crossings. The Airport Connector would also involve some new ROW to allow a wider alignment (four lanes plus provisions for pedestrian/bicycle use) and connections to Vasco Road and Byron Highway.

North Link

Three alignment options were developed for the North Link corridor element. The North Link Option 1 would follow the alignment of Vasco Road and connect to the western terminus of the Airport Connector. Option 2 involves a new alignment that would diverge to the east of Vasco Road and intersect the Airport Connector near Byron Highway. A North Link Option 3 alignment (shown in gray) would run to the east, winding around the east side of the Clifton Forebay, then crossing back over Byron Highway near Kelso Road. Option 3 was considered too circuitous; therefore, it was dropped from future consideration.

I-580 Link

Five alignments were studied for the I-580 Link. Several were dropped from further consideration due to cost and functionality concerns, ROW constraints, and nonattainment of general facility design designation criteria. The I-580 Link to the west of Byron Highway was considered but dropped due to ROW concerns associated with existing utility infrastructure.

As shown in Figure 6.0-1, Options 1, 2a, and 2b begin to the south at the I-580/I-205 interchange and continue north, connecting to one of the North Link options. The southern portion of each of the I-580 Link options would involve construction of a new controlled-access freeway within Alameda County.

Mountain House Parkway Improvement Project

According to the Mountain House Master Plan and San Joaquin County General Plan, Mountain House Parkway north of I-205 will be widened to between four and eight lanes by the Mountain House community developers and will continue to provide driveway access to local residences and businesses. There are no community plans to improve Mountain House Parkway from south of I-205 to I-580. As such, it will remain a two-lane, two-way rural roadway with local

direct, uncontrolled access to adjacent land uses, and will continue to provide local circulation and access to the freeway system.

Use of Mountain House Parkway as an I-580 Link Alignment

In response to public comments, an additional potential I-580 link alignment was studied. This alignment would diverge from I-580 at the existing I-580/Mountain House Parkway interchange to the south of I-205. As suggested by workshop participants, this alignment would continue directly north from I-580, following the centerline of existing Mountain House Parkway. The alignment would continue north across I-205 up to Byron Highway, then turn to the northwest along an alignment immediately adjacent to and west of Byron Highway. The advantages of this alignment would be that it would avoid crossing the eastern portion of Alameda County, involving construction only in San Joaquin County along right-of-way already established for an existing roadway. After careful consideration, however, it was determined that using existing Mountain House Parkway for the I-580 link alignment would be entirely incompatible with freeway design parameters. Consequently, this proposal was dropped from further consideration.

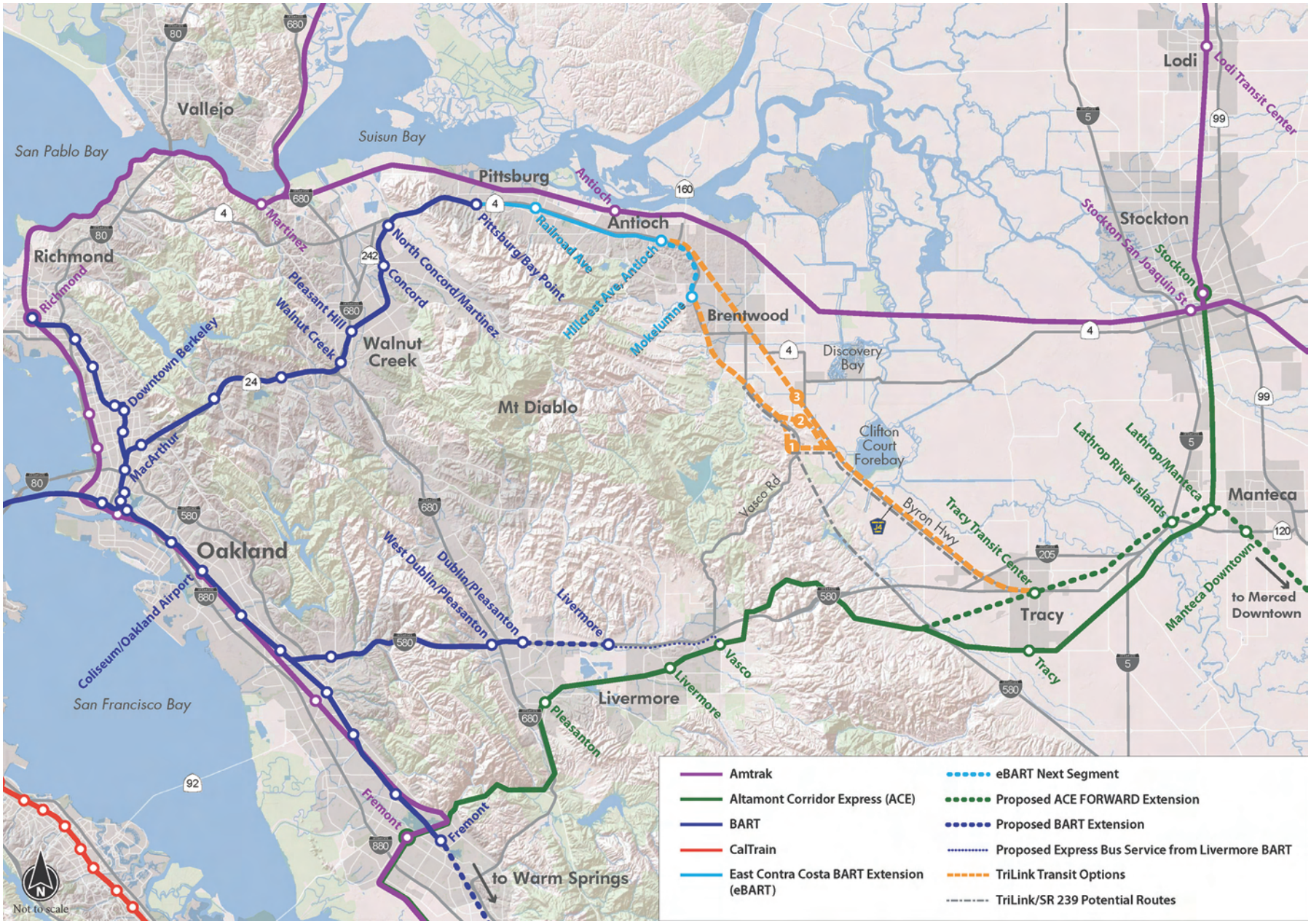
Transit Link

The Transit Link is anticipated to follow the roadway alignments, either in provided median space or adjacent to the roadway of the North Link, Airport Connector, and South Link to connect the residential and job hubs of Brentwood, Mountain House, and Tracy. The Transit Link could be one of many forms, such as express bus service, bus rapid transit (BRT), eBART, Bay Area Rapid Transit (BART), or an ACE (Altamont Commuter Express) rail line. There are three alignment options for the Transit Link, as shown in Figure 6.0-2:

1. Option 1 – This transit component is proposed in the median of the North Link Option 1 alignment, to the north of the Airport Connector, and to the north of the South Link, either within the current UPRR ROW, if possible, or to the northeast of the UPRR ROW.
2. Option 2 – This transit component is proposed in the North Link Option 2 alignment, to the north of the Airport Connector, and to the north of the South Link, either within the current UPRR ROW, if possible, or to the northeast of the UPRR ROW.
3. Option 3 – This transit component is independent of the North Link alignments and would be within the current UPRR ROW along the South Link.

Transit Link Options 1 and 2 would tie into the planned eBART station in Brentwood. Transit Option 3 would tie into the planned eBART station at Hillcrest Avenue in Antioch. All transit options would connect to the Tracy Transit Center, as shown in Figure 6.0-2.

Figure 6.0-2: Potential Future Transit Connections



While construction costs and ridership projections may not initially warrant a dedicated rail line such as BART or ACE, ROW would be preserved for construction, and this service could be preceded with express bus service or a BRT line.

6.1 Design Criteria and Planning Considerations

Three main facility types were considered for the alignment options (shown in Figure 6.1-1) connecting Brentwood to I-580 and I-205: a major arterial with no access control, a conventional highway with partial access control, and a freeway with full access control (see descriptions in Section 6.2). In all cases, alignment and grade standards were applied for the highest capacity facility type possible for each corridor element to allow minimal rework if corridor elements have a phased implementation. Design speeds were determined for each facility type (major arterial – 60 mph, conventional highway – 65 mph, freeway – 80 mph) based on the guidance of the Caltrans HDM, and Facility Design Criteria for the TriLink program were developed using the HDM and local standards, ensuring that the facilities would be compatible with other proposed projects in the study area. Design criteria were established for many roadway characteristics, including design speed, roadway alignment and grade, sight distance, and cross-section geometrics.

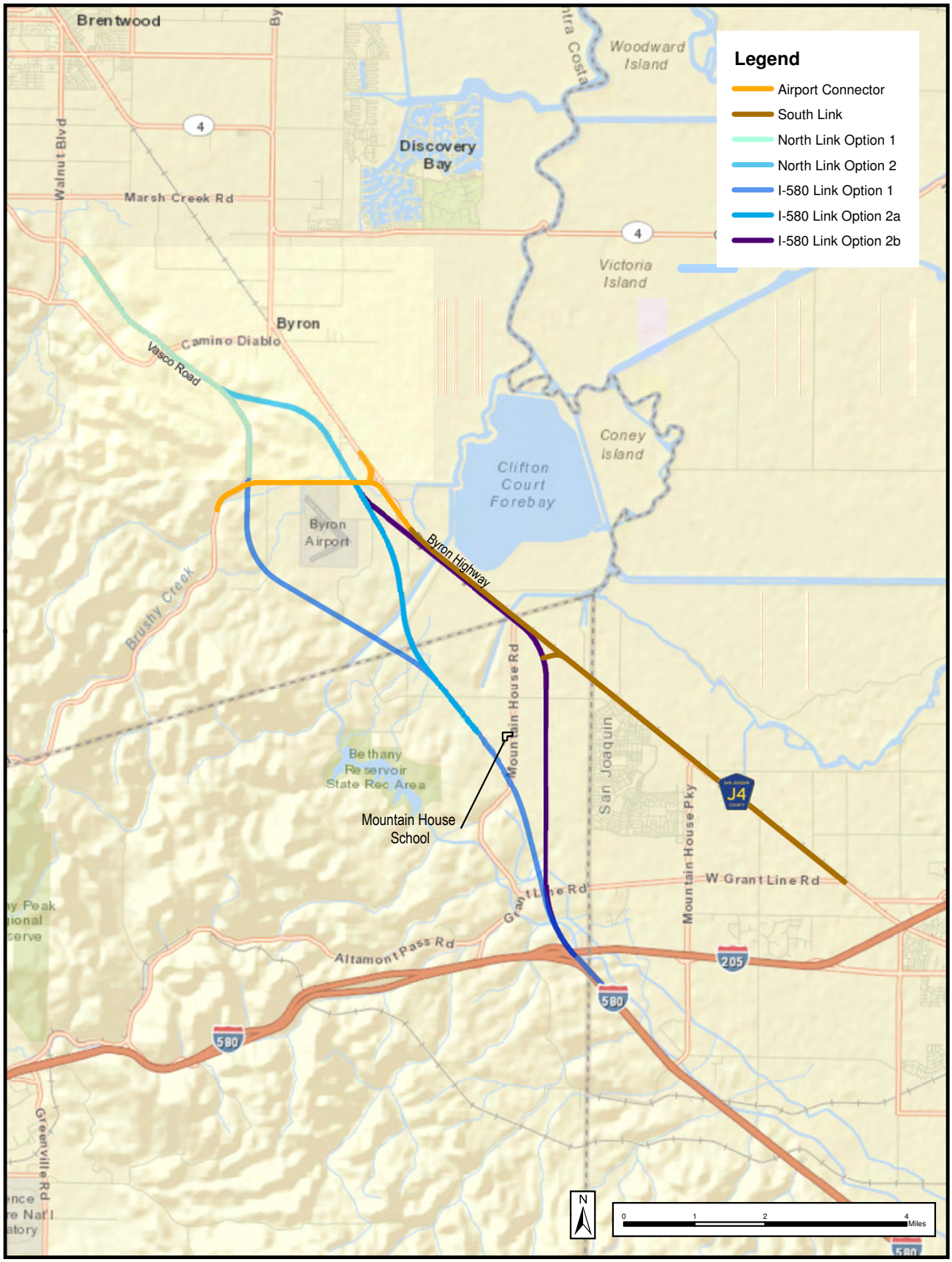
6.1.1 Facility Descriptions

The major arterial facility is a four-lane facility with a median, bicycle lanes, and shoulders. The median allows sufficient width for a left-turn pocket, as well as a pedestrian refuge at crossing locations. Additional pedestrian and bicycle features include a sidewalk and a multiuse pathway. Access to the major arterial facility would occur at every cross street location, as well as driveway locations.

The conventional expressway facility is a full Caltrans standard facility with four lanes and standard median, shoulders, and clear recovery zones. The conventional expressway has a higher design speed than the major arterial, and access is limited to intersections with major cross routes, at a greater spacing than the major arterial. Access via driveways is not provided.

The freeway facility is a full Caltrans standard facility with four lanes and standard median, shoulders, and clear recovery zones. Along the facility, enough ROW width to accommodate a potential future six-lane facility with dedicated transit envelope is reserved. The freeway facility has full access control, with minimal access points provided via interchanges along the corridor.

Figure 6.1-1: Alignment Options



During the refinement of corridor elements and alignments, the major arterial and freeway facility types were selected. While some segments may initially be constructed as conventional expressway facilities, their design standard would follow the criteria of a freeway facility for roadway geometrics to allow future conversion into a freeway facility.

6.1.2 Planning Considerations

The TriLink corridor is heavily constrained by existing physical considerations, such as the Clifton Court Forebay, the Sacramento-San Joaquin River Delta, and UPRR's Mococo rail line to the northeast and by the rolling terrain to the southwest, which serve as general margins for the study area. In between, physical considerations, such as the Delta Mendota Canal, California Aqueduct, an electrical substation and transmission lines, wind and solar farms, Byron Airport, the Mountain House development, and various other existing buildings, are joined by biological considerations such as habitat areas, alkaline soils, vernal pools, wetlands, and prime agricultural lands. The considerations throughout the study area can be seen in Figure 1.2-3.

6.1.3 Airport Connector

The proposed Airport Connector would be a major arterial facility providing an important connection between Vasco Road and Byron Highway (see Figure 6.1-1). Currently, the main travel route from Brentwood to Tracy consists of Vasco Road and Byron Highway, connected by Camino Diablo Road. This route requires a left turn in either direction (i.e., northbound or southbound travel) and consists of two at-grade crossings with UPRR's Mococo rail line. During peak travel times, this two-lane route handles high volumes of traffic.

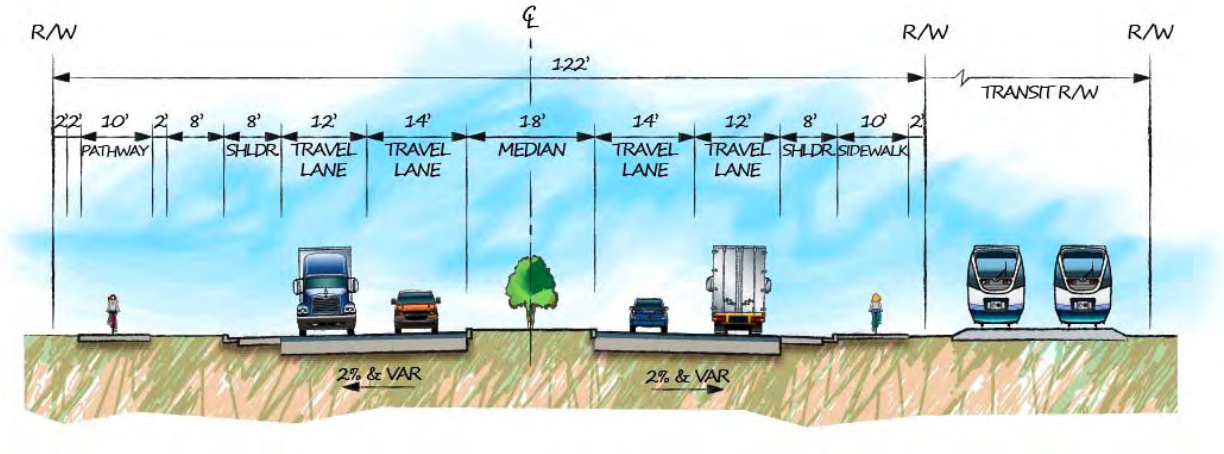
The proposed Airport Connector would improve the connection between Vasco Road and Byron Highway with a 2.7-mile-long major arterial facility along the existing two-lane Armstrong Road. Armstrong Road runs east-west, immediately north of Byron Airport. It does not, however, connect directly to Vasco Road or Byron Highway. An intersection with Vasco Road would be created, and the Airport Connector would directly connect to Byron Highway to the east of the airport, approximately at the location of the current at-grade crossing of the Mococo rail line by Byron Highway. This direct connection would remove a left turn in the northbound direction between Tracy and Brentwood, and it also would avoid both of the at-grade crossings with the Mococo Rail line, improving safety and reducing potential accidents. A grade crossing would be constructed for Byron Highway just north of the existing at-grade crossing, which would tie in to the Airport Connector with an intersection.

The Airport Connector would provide independent utility as a connection between Vasco Road and Byron Highway for local and regional traffic, as well as improve accessibility for Byron

Airport. The Airport Connector also would function as part of the entire TriLink program of improvements, providing potential connections to the North Link and I-580 Link via several potential interchanges, varying with the alignments of the I-580 Link. The interchange for the West I-580 Link alignment would be located west of Byron Airport, in the same location as the intersection of the Airport Connector and Vasco Road would otherwise occur. For the I-580 Link Option 2a and I-580 Link Option 2b alignments of the I-580 Link, the interchange would be to the east of Byron Airport, between Byron Hot Springs Road and Byron Highway. The potential interchanges are described in further detail in Section 6.2.

In Figure 6.1-2, the Airport Connector's proposed cross section contains an 18-foot-wide median to provide a standard 12-foot-wide turn lane and a 6-foot-wide pedestrian refuge at intersection locations. A 2-foot-wide inner shoulder and 12-foot-wide travel lane make up the 14-foot-wide inner lanes, and the outer lanes are 12 feet wide. Outside 8-foot-wide shoulders allow for bicycle travel. On the north side of the Airport Connector, there would be a 10-foot-wide sidewalk and a 2-foot-wide buffer between the sidewalk and the ROW line. On the south side of the Airport Connector, there would be a 10-foot-wide buffer between the shoulder and a multiuse pathway. The multiuse pathway has a proposed total width of 14 feet: a 10-foot-wide travelway with a 2-foot-wide shoulder on either side. There would be a 2-foot-wide buffer between the multiuse pathway shoulder and the ROW line, resulting in a 122-foot-wide ROW. The proposed multiuse pathway on the south side of the Airport Connector is consistent with the cross section for the South Link and with the multiuse pathway through the Mountain House development. This would establish a continuous route for pedestrians and cyclists to Tracy. The 8-foot-wide shoulders also would provide higher-speed bicycle travel, providing a link between Brentwood and Tracy.

Figure 6.1-2 Airport Connector Cross Section (looking west)



A transit component is also being studied in conjunction with the Airport Connector. This transit component could be one of many forms, from express bus to BRT to eBART to full BART build-out. This transit component would be located along the north side of the Airport Connector segment between the North Link and the South Link, connecting to the transit components of the North Link and the South Link.

The Airport Connector potentially impacts several planning considerations, including the Byron Airport property, the Wildlands bank, lands acquired under the ECCC HCP, wetlands, alkaline soils, prime agricultural land, vernal pools, protected open space, and biologically sensitive habitat. The existing ROW for Armstrong Road is narrow at 50 feet, with planning considerations on either side (Byron Airport and biologically sensitive habitat to the south, Wildlands bank to the north, vernal pools on both sides). To the west of the existing Armstrong Road, just to the east of Vasco Road, there is a parcel that has been purchased under the ECCC HCP and contains wetlands that have been restored. The Airport Connector could impact the northern edge of this parcel depending on the geometric alignment. In addition, to the east of the existing Armstrong Road are alkaline soils. See Chapter 7 for evaluation of potential impacts and mitigation measures.

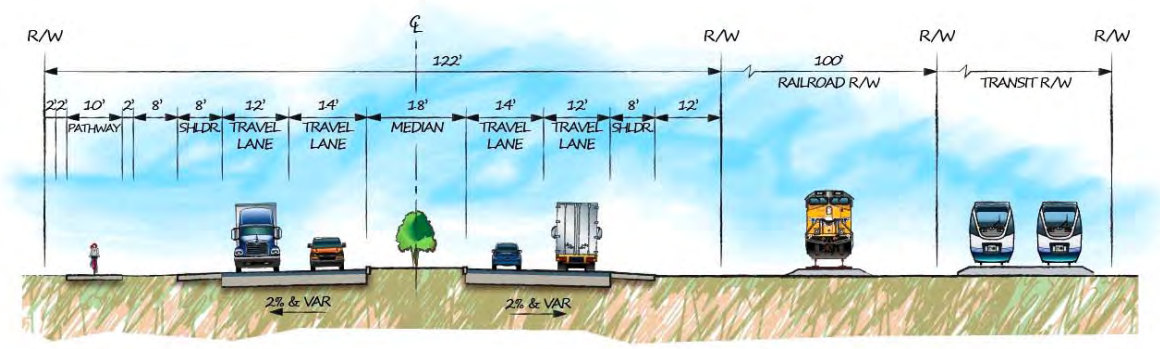
The Airport Connector alignment along Armstrong Road could be a covered activity under the current HCP/NCCP if it complied with the specific design requirements. These include an elevated viaduct design, wildlife crossings, minimum sizing for culverts, fencing designs, median designs for wildlife, and other requirements to minimize effects on habitat and hydraulic connections in an area containing existing preservation lands. The Airport Connector could be designed to meet these specific requirements.

6.1.4 South Link

The South Link is a proposed 7.9-mile-long major arterial facility that would provide a connection between the Airport Connector, the Mountain House development, and Tracy. The South Link would run along Byron Highway from the existing at-grade crossing with UPRR's Mococo rail line to the I-205/Lammers Road/Eleventh Street interchange project in Tracy (see Figure 6.1-1). The City of Tracy's I-205/Lammers Road/Eleventh Street interchange project is proposed as a six-lane major arterial facility through the interchange, narrowing to a two-lane facility north of the interchange before connecting to Byron Highway on the northwest edge of the city. The Mountain House development is also proposing a six-lane major arterial through its development, narrowing to two lanes on either side. The South Link would fill the gap between these two projects, improving the existing narrow two-lane roadway into a four-lane major arterial with median, shoulders, and pedestrian and bicycle facilities to match the cross

sections of the other projects. The South Link would also close the gap between the Mountain House development and the proposed Airport Connector, providing a direct path from Tracy to the Airport Connector. In Figure 6.1-3, the proposed South Link cross section contains an 18-foot-wide median to provide standard 12-foot-wide turn lanes and 6-foot-wide pedestrian refuges at intersection locations. A 2-foot-wide inner shoulder and 12-foot-wide travel lane make up the 14-foot-wide inner lanes, and the outer lanes would be 12 feet wide. Outside 8-foot-wide shoulders would allow for bicycle travel. On the east side of the South Link, there would be a 12-foot-wide buffer between the shoulder and the UPRR Mococo rail line ROW. On the west side of the South Link, there would be a 10-foot-wide buffer between the shoulder and a mixed-use pathway. The mixed-use pathway would have a total width of 14 feet: 10 feet of travelway with a 2-foot-wide shoulder on either side. There is a 2-foot-wide buffer proposed between the multiuse pathway shoulder and the ROW line, resulting in a 122-foot-wide ROW. The multiuse pathway on the south side of the South Link is consistent with the cross section for Byron Highway through the Mountain House development, and it would provide pedestrian and bicycle connectivity from Mountain House to Byron and Tracy. The 8-foot-wide shoulders would provide higher-speed bicycle travel, providing a link between Brentwood and Tracy.

Figure 6.1-3 South Link Cross Section (looking north)



A transit component is also being studied in conjunction with the South Link. This transit component could be one of many forms, from express bus to BRT to eBART to full BART build-out. This transit component would be located to the east of the South Link, either within the current UPRR ROW, if possible, or farther east of the UPRR ROW. A dedicated ROW for transit would provide the highest level of service and avoid conflicts with left-turning vehicles onto and off of the South Link. While a BRT system could be located in the roadway ROW with center-running lanes, a dedicated BRT ROW would provide a higher level of service, and a BART system would not be possible in the roadway ROW without elevating the tracks and providing a concrete barrier separation.

The South Link has minimal impacts to planning considerations because it would follow the existing Byron Highway alignment and has minimal ROW impacts, affecting only alkaline soils and prime agricultural land. A transit component along the South Link could impact the Primary Delta Protection Zone if the existing Mococo Rail line ROW is not available for transit operations.

The South Link alignment would potentially impact alkaline soil along approximately 20 percent of the alignment. Because alkaline soils can support more geographically limited special-status plant and animal species, areas of each proposed alignment that would impact alkaline soils are expected to require additional preconstruction surveys, impact avoidance measure implementation, and potentially mitigation.

6.1.5 North Link

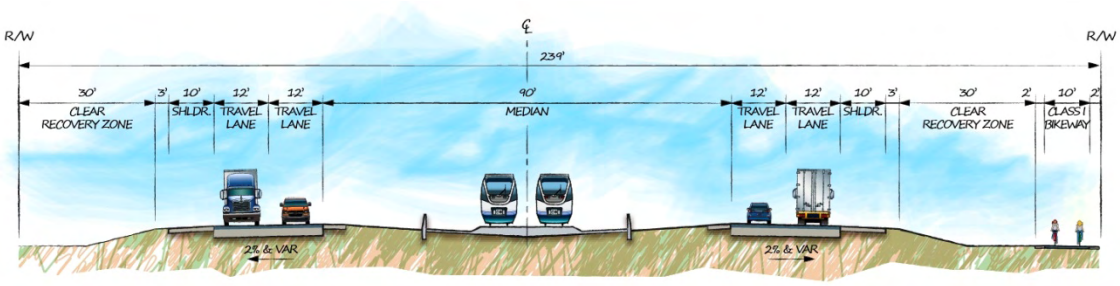
The North Link is a proposed freeway facility connecting to the planned SR 4 improvements at the current Vasco Road and Walnut Boulevard intersection and to the Airport Connector in the area of Byron Airport (see Figure 6.1-1). The North Link would be an extension of SR 4, a project over the last 24 years that improved access to the Brentwood and ECCC area through improvements along SR 4 from the junction with SR 160 to Vasco Road at Walnut Boulevard in Brentwood. The North Link would continue this progression of improvements and, along with the I-580 Link, would complete the freeway connection through eastern Contra Costa County and eastern Alameda County by connecting to the I-580/I-205 interchange west of Tracy.

The proposed North Link would continue the SR 4 improvements with a freeway facility along two potential alignments. The 4.1-mile-long Option 1 alignment would continue from the end of the proposed SR 4 project on Vasco Road at Walnut Boulevard, following along Vasco Road to the south, and would connect to the Airport Connector and the I-580 Link Option 1, west of Byron Airport. The alignment generally would follow the alignment of Vasco Road with a few improvements, mainly to straighten the alignment, to meet the design standards of a freeway facility. The 5.2-mile-long Option 2 alignment would continue from the end of the proposed SR 4 project on Vasco Road at Walnut Boulevard, following along Vasco Road to the point where Vasco Road turns to the south. From here, Option 2 would diverge from Vasco Road and proceed east, passing north of the Byron Hot Springs before turning south, crossing Byron Hot Springs Road, and connecting with the Airport Connector and I-580 Link Option 2a, to the east of the existing Armstrong Road. A new interchange would be constructed at the divergence from Vasco Road. The North Link would connect to the Airport Connector and the I-580 Link with an interchange either to the west or to the east of Byron Airport, depending on the North Link alignment option. The potential interchanges are described in further detail in Section 6.2.

Figure 6.1-4 shows the cross section for the North Link, which is a Caltrans standard four-lane freeway cross section with a widened median. The median is 90 feet wide, containing a 5-foot-wide inner shoulder in each direction. In both directions, there are two 12-foot-wide lanes with 10-foot-wide outer shoulders. Three (3) feet from the shoulder is the hinge point, and then there are 30 feet of clear recovery zone to the ROW line or Class I bikeway. On the east side of the roadway, adjacent to the clear recovery zone, there is a 14-foot-wide wide Class I bikeway. This 14-foot width accommodates a 10-foot-wide bikeway with 2-foot-wide shoulders on either side. This results in a ROW of 239 feet.

The 90-foot-wide median in the North Link, as opposed to a Caltrans standard 62-foot-wide median, is a result of the transit component of the North Link. North of the TriLink study area, BART runs in the median of SR 4. In addition, SR 4 has been designed to accommodate a potential future BART or eBART extension. As the North Link continues the progression of improvements along SR 4 and Vasco Road, providing space for a transit component in the North Link median is an important feature. The 90-foot-wide median provides adequate width for a transit component (46 feet) and the required space to widen the facility to six lanes in the future (two 12-foot-wide lanes, two 10-foot-wide inner shoulders) without requiring any additional ROW. This transit component could be one of many forms, from BRT to eBART to full BART build-out.

Figure 6.1-4 North Link Cross Section (looking north)



The North Link Option 1 alignment would have minimal impacts to planning considerations because it follows the existing Vasco Road alignment and has minimal ROW impacts. The existing Vasco Road ROW passes through prime agricultural land and a vernal pool area; however, any impacts to these considerations would be minimal. The North Link Option 1 alignment also provides the opportunity to improve habitat connectivity by improving wildlife crossings over the existing Vasco Road.

The North Link Option 2 alignment potentially impacts several planning considerations, including prime agricultural lands, vernal pools, and alkaline soils. Additionally, Option 2 runs in close proximity to Byron Hot Springs, which is a cultural resource.

The North Link Option 2 would impact alkaline soils along approximately 15 percent of the alignment, and the North Link Option 1 alignment would impact alkaline soils along approximately 3 percent of the alignment. Because alkaline soils can support more geographically limited special-status plant and animal species, areas of each proposed alignment that would impact alkaline soils are expected to require additional preconstruction surveys, impact avoidance measure implementation, and potentially mitigation.

Analyzing just the impacts of the various North Link alignments alone is not sufficient because the impacts associated with each of the I-580 Link alignments must be taken into consideration. Due to the connection location with the Airport Connector, the I-580 Link Option 1 is paired with the North Link Option 1, and the I-580 Link Options 2a and 2b alignments are paired with the North Link Option 2 alignment to complete the direct freeway connection between SR 4 and the I-580/I-205 interchange.

6.1.6 I-580 Link

The I-580 Link is a proposed freeway facility that would connect the Airport Connector in the area of Byron Airport to the existing I-580/I-205 interchange in eastern Alameda County (see Figure 6.1-1). The I-580 Link is a continuation of the North Link and would continue the progression of improvements from SR 4 to the North Link and complete the freeway connection through eastern Contra Costa County and eastern Alameda County. The I-580 Link, in conjunction with the North Link, would provide a direct freeway connection from SR 4 and the eastern Contra Costa County communities of Brentwood, Pittsburg, and Antioch to the I-580/ I-205 interchange, Tracy, and points to the south and east in the San Joaquin Valley. The I-580 Link would provide north-south regional mobility and inter-regional goods movement.

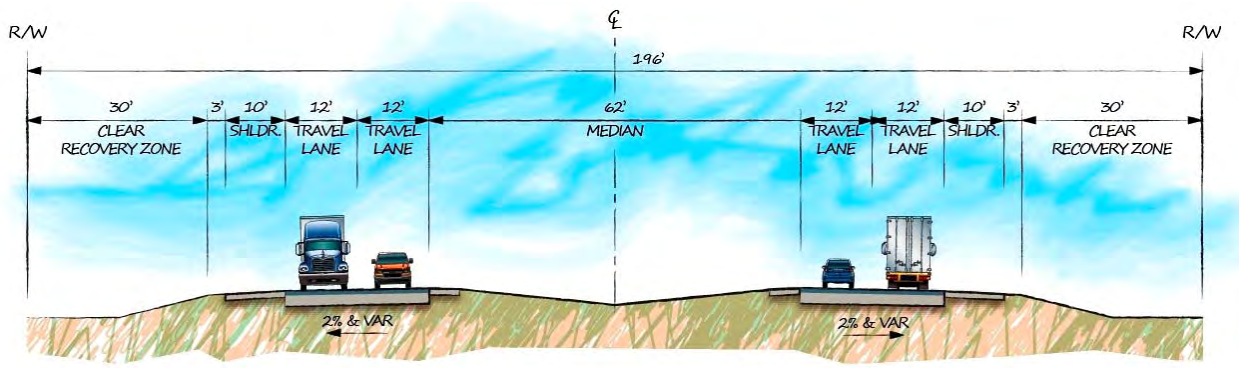
The I-580 Link would connect SR 4 and the North Link to the I-580/I-205 interchange with a freeway facility along three potential alignments. The 9.2-mile-long Option 1 alignment would continue from the end of the North Link Option 1 alignment along existing Vasco Road south, passing to the west of Byron Airport. From there, the alignment would turn to the southeast, entering Alameda County and passing to the southwest of the Mountain House School[26], before

[26] Mountain House Elementary School is outside the 0.25-mile buffer from the centerline of each proposed alignment, and its parcel is not impacted. The school is likely a historic resource, eligible for its embodiment of a distinctive style of architecture in the region and for its association with community development in the area.

turning south and connecting to the existing I-580/I-205 interchange. The 8.1-mile-long Option 2a alignment would continue from the end of the North Link Option 2 alignment to the east of Byron Airport and proceed south into Alameda County, where it would follow the same path as the Option 1 alignment, to the southwest of the Mountain House School and to the south to the I-580/I-205 interchange. The 8.7-mile-long Option 2b alignment also would continue from the end of the North Link Option 2 alignment, but just south of the interchange with the Airport Connector, the Option 2b alignment would veer to the southeast and run adjacent to Byron Highway. Once into Alameda County, the alignment would turn south and continue to the I-580/I-205 interchange. If the Option 2b alignment were to run adjacent to Byron Highway, Byron Highway would serve as a frontage road, with access to the I-580 Link occurring at the interchange with the Airport Connector. If the Byron Alignment were to be placed on Byron Highway, an interchange would be constructed in Alameda County to provide access from Byron Highway onto the new freeway facility. Traffic wanting to continue north on Byron Highway could exit the I-580 Link at the Airport Connector interchange and proceed north on Byron Highway over the grade separation.

In Figure 6.1-5, the proposed cross section for the I-580 Link is a Caltrans standard four-lane freeway cross section. The median would be 62 feet wide, containing 5-foot-wide inner shoulders in each direction. In both directions, there would be two 12-foot-wide lanes with 10-foot-wide outer shoulders. Three (3) feet from the shoulder is the hinge point, and then there would be a 30-foot-wide clear recovery zone to the ROW line. This would result in a 196-foot-wide ROW. If the I-580 Link Option 2b alignment runs on top of the existing Byron Highway, a multiuse pathway would be added to the southwest of the cross section between Byron Highway and the Airport Connection, in the same manner as what is included in the North Link cross section, to connect to the multiuse pathway of the Airport Connector and the South Link.

Figure 6.1-5 I-580 Link Cross Section (looking north)



The I-580 Link would connect to the Airport Connector and the North Link through two potential interchange locations. The Option 1 alignment would have one interchange location, while the Option 2a and 2b alignments would have an interchange at the same location.

The Option 1 alignment would contain an interchange to the west of Byron Airport, where the Airport Connector ties into Vasco Road and the North Link. The Option 2a and 2b alignments would contain an interchange to the east of Byron Airport along the Airport Connector, between Byron Hot Springs Road and Byron Highway. Modifications to the existing I-580/I-205 interchange would also be necessary to connect to the new I-580 Link. More information on these interchanges can be found in Section 6.2.

All three different I-580 Link alignments would impact different planning considerations.

The I-580 Link Option 1 alignment would impact protected open space, lands acquired under the ECCC HCP, vernal pools, alkaline soils, prime agricultural land, alkaline scalds, and wetland. The protected open space is on the lands acquired under the ECCC HCP and in the area of a proposed interchange between the Airport Connector/Vasco Road and the I-580 Link/North Link. In comparison to the Option 2a and 2b alignments, the impacts to the alkaline soils for the Option 1 alignment would be minimal.

The I-580 Link Option 2a alignment would impact biologically sensitive habitat, vernal pools, alkaline soils, prime agricultural land, alkaline scalds, and wetland. The biologically sensitive habitat impacted is on the southeast corner of the Byron Airport property.

The I-580 Link Option 2b alignment would impact vernal pools and alkaline soils.

Analyzing just the impacts of the various I-580 Link alignments alone is not sufficient because the impacts associated with each of the North Link alignments must be taken into consideration. Due to the connection location with the Airport Connector, the I-580 Link Option 1 is paired with the North Link Option 1, and the I-580 Link Option 2a and 2b alignments are paired with the North Link Option 2 alignment to complete the direct freeway connection between SR 4 and the I-580/I-205 interchange.

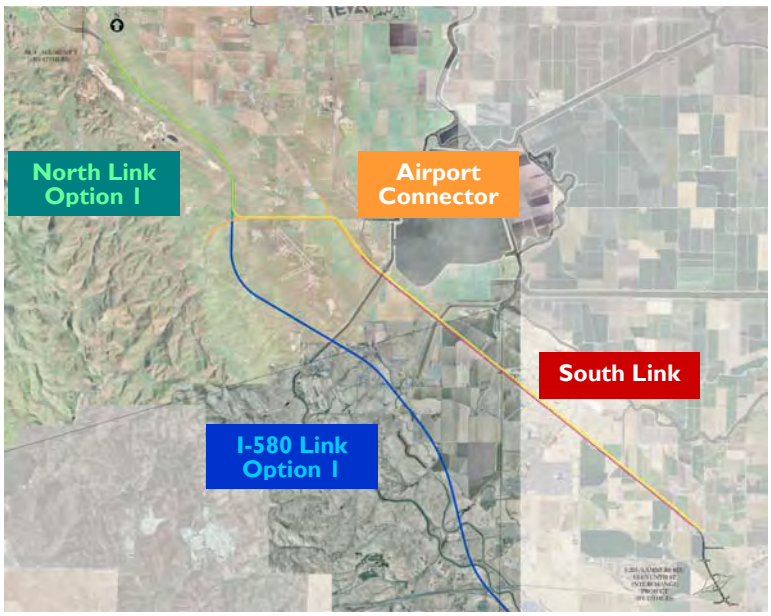
The I-580 Link Option 2a would impact alkaline soils along approximately 25 percent of the alignment, and the I-580 Link Option 1 would impact alkaline soils along approximately 10 percent of the alignment. Because alkaline soils can support more geographically limited special-status plant and animal species, areas of each proposed alignment that would impact alkaline soils are expected to require additional preconstruction surveys, impact avoidance measure implementation, and potentially mitigation.

6.1.7 North Link and I-580 Link Potential Alignment Packages

Three potential alignment packages between the I-580 and North Link alignment options are described below. As the project development process continues, other alignment packages may be identified and considered.

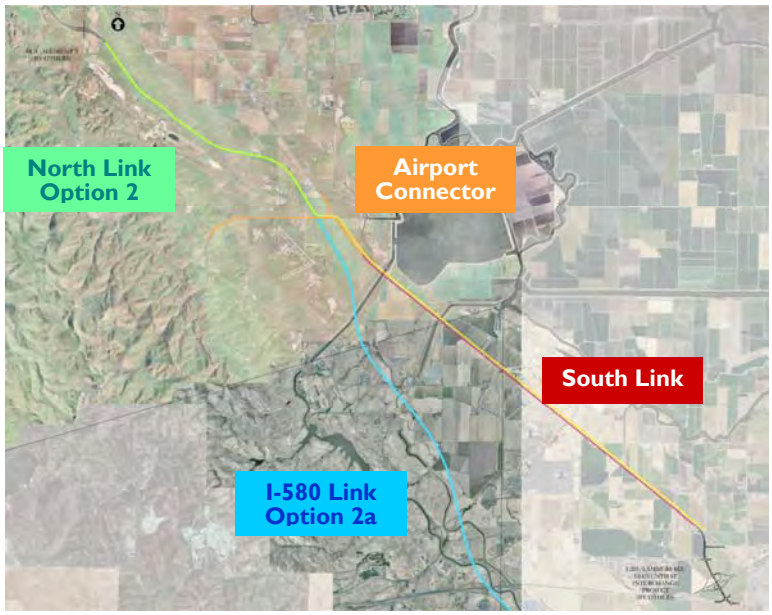
1. **North Link and I-580 Link Option 1:** Option 1 includes the western alignment for the North Link and I-580 Link.

Figure 6.1-6 North Link and I-580 Link Option 1



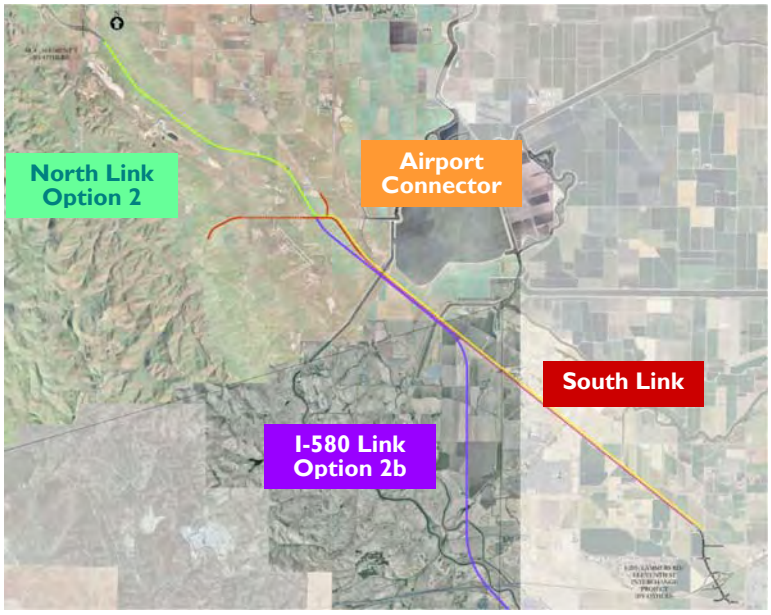
2. **North Link Option 2 and I-580 Link Option 2a:** This proposed option includes the eastern alignment for the North Link and the middle alignment for the I-580 Link.

Figure 6.1-7 North Link Option 2 and I-580 Link Option 2a



3. **North Link Option 2 and I-580 Link Option 2b:** The easternmost alignments are the North Link Option 2 and the I-580 Link Option 2b, which would run parallel to the existing Byron Highway.

Figure 6.1-8 North Link Option 2 and I-580 Link Option 2b



6.2 Access and Circulation

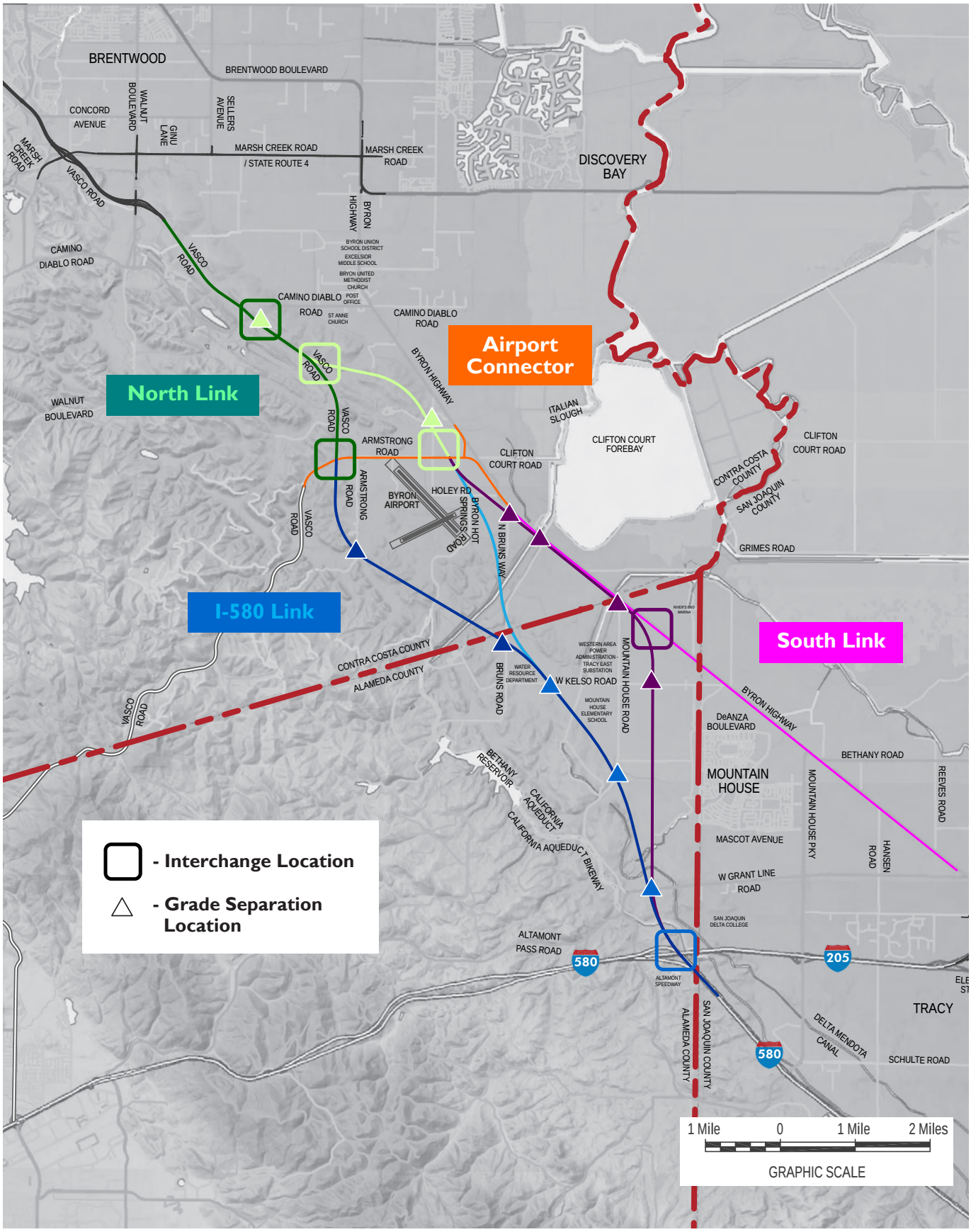
The TriLink program proposes several new interchanges, as well as modifications to the existing I-580/I-205 interchange, to connect the I-580 Link for each alignment option. The North Link Options 1 and 2 and the I-580 Links would provide the most direct connection between SR 4 and the I-580/I-205 interchange. The North Link Option 1/I-580 Link Option 1 would provide this connection with one system interchange and one local interchange, while the North Link Option 2/I-580 Link Option 2a potentially would require two system interchanges, and the North Link Option 2/I-580 Link Option 2b potentially would require three system interchanges, as shown in Figure 6.2-1. The I-580 Link Options 1 and 2a would have full access control, without any interchange between the I-580/I-205 interchange at the Airport Connector in Contra Costa County. As a result, these alignments would be compliant with Alameda County's growth restrictions. The I-580 Link Option 2b would require an interchange with Byron Highway in Alameda County if the alignment is to run over the existing Byron Highway; however, this interchange would only provide access to and from Byron Highway toward San Joaquin County, and no direct access into Alameda County would be provided.

6.2.1 North Link Option 1/I-580 Link Option 1

The North Link Option 1/I-580 Link Option 1 alignment would contain an interchange to the west of Byron Airport where the Airport Connector ties into Vasco Road and the North Link, as shown in Figure 6.2-1. The low-capacity interchange option would consist of an Airport Connector/Vasco Road overcrossing over the North Link/I-580 Link. Off-ramps would be in a spread diamond layout. In addition, the southbound North Link off-ramp would diverge to provide a direct connection to southbound Vasco Road, and northbound Vasco Road to northbound North Link movement would be handled with a loop ramp. The high-capacity interchange would also contain an overcrossing and a spread diamond layout with a direct connection from the southbound North Link to southbound Vasco Road, but it would also contain flyover direct connection from northbound Vasco Road to northbound North Link instead of the loop ramp, resulting in a three-level interchange.

The North Link Option 1/I-580 Link Option 1 alignment would also contain an interchange for local access at Camino Diablo Road. This interchange would be a spread diamond interchange.

Figure 6.2-1: Potential Interchange and Grade Separation Locations



6.2.2 North Link Option 2/I-580 Link Option 2a

The North Link Option 2/I-580 Link Option 2a alignment would include an interchange to the east of Byron Airport along the Airport Connector, between Byron Hot Springs Road and Byron Highway, as shown in Figure 6.2-1. A low-capacity interchange option would consist of an Airport Connector overcrossing of the North Link and I-580 Link with a spread diamond layout. The Byron Highway grade separation over the UPRR Mococo rail line would tie into the overcrossing to the east of the interchange. A high-capacity interchange would feature the overcrossing and spread diamond layout, but it would also contain a loop ramp providing a direct connection from the southbound North Link to the eastbound Airport Connector (and thus southbound South Link) and a direct connection from the westbound Airport Connector to the northbound North Link.

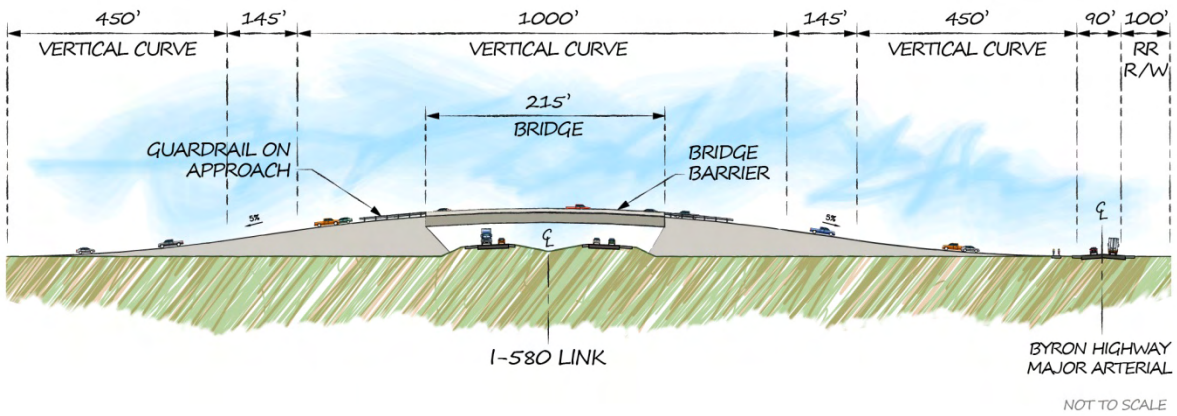
The North Link Option 2/I-580 Link Option 2a alignment would have an overcrossing at Camino Diablo Road but not an interchange as with the Option 1 alignment. An interchange at the departure point from Vasco Road would be constructed, and Vasco Road would continue north from that point as a new two-lane local roadway to Camino Diablo Road. This new roadway would provide the local access that is currently being provided, and would continue under the Option 1 alignment, at the Camino Diablo Road intersection. A low-capacity interchange would consist of a spread diamond interchange with a direct connection from the southbound North Link to southbound Vasco Road. A high-capacity interchange would add a direct connection flyover ramp for northbound Vasco Road to northbound North Link, resulting in a three-level interchange. An interchange at Camino Diablo Road is not included in the Option 2a alignment because the need for an interchange at the Vasco Road divergence would create substandard interchange spacing per the Caltrans HDM, and it would result in weaving issues between the Camino Diablo interchange and the Vasco Road interchange.

6.2.3 North Link Option 2/I-580 Link Option 2b

The North Link Option 2/I-580 Link Option 2b alignment would contain an interchange to the east of Byron Airport along the Airport Connector, between Byron Hot Springs Road and Byron Highway, as shown in Figure 6.2-1. A low-capacity interchange option would consist of an Airport Connector overcrossing of the North Link and I-580 Link and directly connecting to the Mococo Line overcrossing. On- and off-ramps would be in a spread diamond layout. A high-capacity interchange would feature the overcrossing and spread diamond layout, but it would also contain a loop ramp providing a continuous movement connection from the southbound I-580 Link to southbound Byron Highway. The North Link Option 2/I-580 Link Option 2b alignment would contain a third interchange if the I-580 Link Option 2b runs parallel to the

existing Byron Highway. In this case, the South Link from Tracy would curve to the southwest and cross over the I-580 Link and end just to the west of the I-580 Link. A spread diamond interchange would be constructed to connect the South Link to the I-580 Link in the low-capacity option, with a trumpet interchange in the high-capacity option. If the I-580 Link Option 2b runs adjacent to the existing Byron Highway, just south of the interchange with the Airport Connector, local access and circulation would be maintained by having grade separations over the I-580 Link, as shown in Figure 6.2-2.

Figure 6.2-2 I-580 Link Option 2b – Grade Separation (looking north)



6.2.4 I-580 and I-205 Interchange

The existing interchange at I-580 and I-205 is a two-level interchange. The I-580 Link connection at this location would add two additional levels. The existing topography, the Delta Mendota Canal, and the California Aqueduct make adding this new connection challenging. The TriLink program would add connections between the I-580 Link and all of the existing legs of the interchange. These connections would be the southbound I-580 Link to westbound I-580, to eastbound I-580, and to eastbound I-205; eastbound I-580 to northbound I-580 Link; westbound I-580 to northbound I-580 Link; and westbound I-205 to northbound I-580 Link. Connections that do not exist between existing legs (westbound I-580 to eastbound I-205 and westbound I-205 to eastbound I-580) would not be added as part of the TriLink program, but they would not be precluded for total system balance. The resulting interchange would be four levels.

The anticipated interchange options for the various alignments are summarized in Table 6.2-1.

Table 6.2-1 Potential Interchange and Grade Separation Locations

Alignments		Potential Interchange Locations	Potential Grade Separation Locations[1]
North Link Option 1	I-580 Link Option 1	Vasco Road / Camino Diablo Road Vasco Road / Armstrong Road Byron Highway / Armstrong Road I-580 Link / I-580 / I-205	Armstrong Road (N/S portion over the UPRR line) Bruns Road West Kelso Road Mountain House Road Grant Line Road
North Link Option 2	I-580 Link Option 2a	Vasco Road (roughly 1 mile south of Camino Diablo Road) Byron Highway / Armstrong Road I-580 Link / I-580 / I-205	Camino Diablo Road Byron Hot Springs Road West Kelso Road Mountain House Road Grant Line Road
	I-580 Link Option 2b	Vasco Road (roughly 1 mile south of Camino Diablo Road) Byron Highway / Armstrong Road Byron Highway / I-580 Link / I-580 / I-205	Camino Diablo Road Byron Hot Springs Road North Bruns Way Bruns Road Mountain House Road Kelso Road Grant Line Road

[1] An overcrossing of a local roadway or over the existing UPRR line.

6.3 Pedestrian and Bicycle Circulation

The TriLink program of improvements aims to provide a true multimodal corridor, which means pedestrian and bicycle features would be included along with roadway and transit features.

The study area is void of pedestrian and bicycle facilities outside of the termini in Brentwood and Tracy, where minimal facilities are present. The existing roadway infrastructure is not suitable for cycling, and there are no pedestrian facilities along Byron Highway or other local roadways. The only existing bicycle facility in the study area is the California Aqueduct bikeway. Despite the lack of existing facilities, there are several bicycle facilities planned on the southern end of Brentwood, as well as in Tracy. The Mountain House development also plans to add bicycle lanes and a multiuse pathway along Byron Highway within its limits. As a result, the TriLink program has a great opportunity to link these separate facilities together and provide high-class bicycle connectivity between Brentwood and Tracy, and the existing California Aqueduct bikeway via Burns Road. The specifics of these bicycle and pedestrian facilities within

the roadway cross sections were described in Section 6.1. Figure 1.2-2 shows the existing and proposed TriLink bicycle facility improvements.

6.4 Safety Improvements

The proposed improvements of the TriLink Program will contribute to a safer environment throughout the corridor. Improving the existing facilities of Byron Highway, Armstrong Road, and Vasco Road to current recognized standards will improve not only the level of safety for motorists, but also for cyclists and pedestrians.

The proposed cross-section improvements along Byron Highway and Armstrong Road include two lanes in each direction, which would allow the passing of slower vehicles without entering the oncoming traffic lane. A median would provide separation between the opposing lanes of traffic, and left-turn bays would provide a refuge for turning vehicles. Standard shoulder widths provide a buffer from roadside obstacles, some recovery area for errant vehicles, and a safe location for disabled vehicles. The existing Byron Highway and Armstrong Road do not contain multiple lanes for passing, medians, left-turn bays, or standard-width shoulders. Dedicated facilities for pedestrians and cyclists, including the multiuse pathway and median pedestrian refuges, would provide safe passageways for cyclists and pedestrians along Byron Highway and Armstrong Road, as opposed to having to compete for space with automobiles along the edge of the travel lanes. The existing Byron Highway crosses the UPRR Mococo rail line, and the at-grade rail crossing would be replaced with a grade separation, removing the conflict between vehicles and trains. The forecasted shift in truck traffic from Byron Highway to the new I-580 Link would also improve safety along Byron Highway.

Similarly, Vasco Road would also see an increase in safety measures through improving the roadway geometrics to the current standards along the North Link segment. Providing additional travel lanes, median, and standard-width shoulders would provide the same safety benefits along Vasco Road as along Byron Highway. Replacing the existing intersection at Camino Diablo Road with a grade separation would reduce the potential conflicting movements, which would occur at lower speeds at the signalized local intersection at the on- and off-ramp termini. The North Link segment would be designed to full Caltrans freeway design standards, resulting in additional design elements that would improve the safety, such as a clear recover zone, setbacks to fixed objects, and larger curve radii, which are not provided at some locations along the existing Vasco Road. A dedicated bicycle pathway along the North Link would provide cyclists with a separated facility away from the vehicular traffic.

The I-580 Link also would be designed to full Caltrans freeway design standards, providing the same benefits as along the North Link. In addition, this new roadway would provide a more direct route

for regional traffic. As an access-controlled facility with few interchanges, the I-580 Link would have less conflicting vehicular movements than the existing route through western Contra Costa and Alameda counties for regional traffic. The new facility would redirect regional traffic from local roadways, reducing the number and nature of the vehicles on the local roadway network.

6.5 Corridor Elements Cost Estimates

As part of the feasibility study, a programming-level estimate was developed to help define the scope of work and delivery options, manage risk, and support the implementation analysis and consideration of further alternative development. Due to the preliminary nature of the feasibility study, the goal was to develop a range of costs for programming, amid many potential variables in the program.

There is a wide range of possible outcomes for the TriLink program and, at this stage in the program development process, the cost estimate needed to take into account the variety in alignment options and lengths, both those already developed in the feasibility study and potential revisions through the design process. In addition, each alignment has various options for interchanges that can greatly influence the final project costs. One area where a wide range of options affects the project cost is the implementation strategy and timeline. At this time, it is not known what alignments will be constructed, when that construction will occur, and in what configuration the components will be constructed (e.g., number of lanes, capacity of interchanges). The costs shown in Table 6.4-1 represent a full build-out of each component in 2013 dollars. Escalating the construction costs to the midpoint of year-of-expenditure dollars will increase the cost from each segment. Additional costs may be incurred due to additional construction required based on the selected implementation strategy. To best cover all of the possible project cost outcomes, a range of costs for each segment was developed.

Table 6.4-1 TriLink Preliminary Cost Estimates (2013 dollars)

Segment	Estimated Cost ($)
Airport Connector	$ 30 million to $ 50 million
North Link	$ 70 million to $ 120 million
South Link	$ 80 million to $ 120 million
I-580 Link	$ 450 million to $ 500 million
Transit Link	Varies by mode
TOTAL	$ 630 million to $790 million

The assumptions developed by the Study Team to establish the project cost raw order-of-magnitude range were based on potential project alternatives and major areas of risk, with appropriate consideration for contingency necessary to support a feasibility study level of analysis. While general alignment possibilities have been studied, there are still several influential factors present at the feasibility study stage that can modify the project cost.

The TriLink study preliminary cost estimates used a parametric estimating process by using unit costs gathered from similar type and magnitude projects through a statistical relationship between historical data and other variables. Quantities were developed for items dependent on the alignment length and component cross section. Allowances were determined for items not directly tied to the known roadway geometrics. These cost estimates include construction, mobilization, contingency, support services, ROW, and environmental mitigation.

Chapter 7
Evaluation of Corridor Elements

All alignments developed during the TriLink study were developed to address the five key areas identified during the stakeholder outreach process. These include the following:

- Regional Connectivity
- Planned Development and Job Realization
- Roadway Safety
- Emergency Response
- Goods Movement

Additional consideration criteria stem from the natural environment, physical built environment, planning entitlement, and policy stipulation throughout the study area; these are discussed below. All of these criteria were developed under a comprehensive vision of the project's influence.

7.1 Study Considerations/Criteria

The Study Team developed a variety of physical and policy considerations; the data was collected from numerous sources: aerial photography, GIS mapping, site observation, and information from city, county, and local agencies. These considerations have been cataloged, and boundaries for each have been established using AutoCAD and ArcGIS software packages as shown in Figure 7.1-1. The alignment evaluation process involved documenting the potential impacts and rating each alignment based on whether there would be "no discernible impact," "less impact," or "more impact" on each consideration.

7.2 Evaluation Results

The potential impacts of the four components and their alignment options are described in the following subsections and summarized in Table 7.3-1.

7.2.1 Biological Resources

The potential alignments were developed to minimize impacts to biological resources whenever possible. The biological resources evaluated include sensitive habitat, special-status wildlife and plant species habitat, protected open space or prime farmland, waters, wetlands, and riparian habitat. See Chapter 5 for more information on these biological resources, including rare plants, animal species, and soils regarding their conservation designation. The potential impacts to biological resources are described below and summarized in Table 7.3-1.

Planning for TriLink is still in the early stages, so it is important to identify all potential biological impacts; however, it is likely that most impacts can either be avoided through careful roadway siting or mitigated through onsite or offsite mitigation. These possibilities will be considered further as project design progresses.

7.2.1.1 Sensitive Habitat

All four proposed corridor elements and their optional alignments would result in some impact to sensitive habitat; however, construction outside of existing road alignments, specifically the I-580 Link and the North Link, would result in greater impact because they are not next to existing roadways.

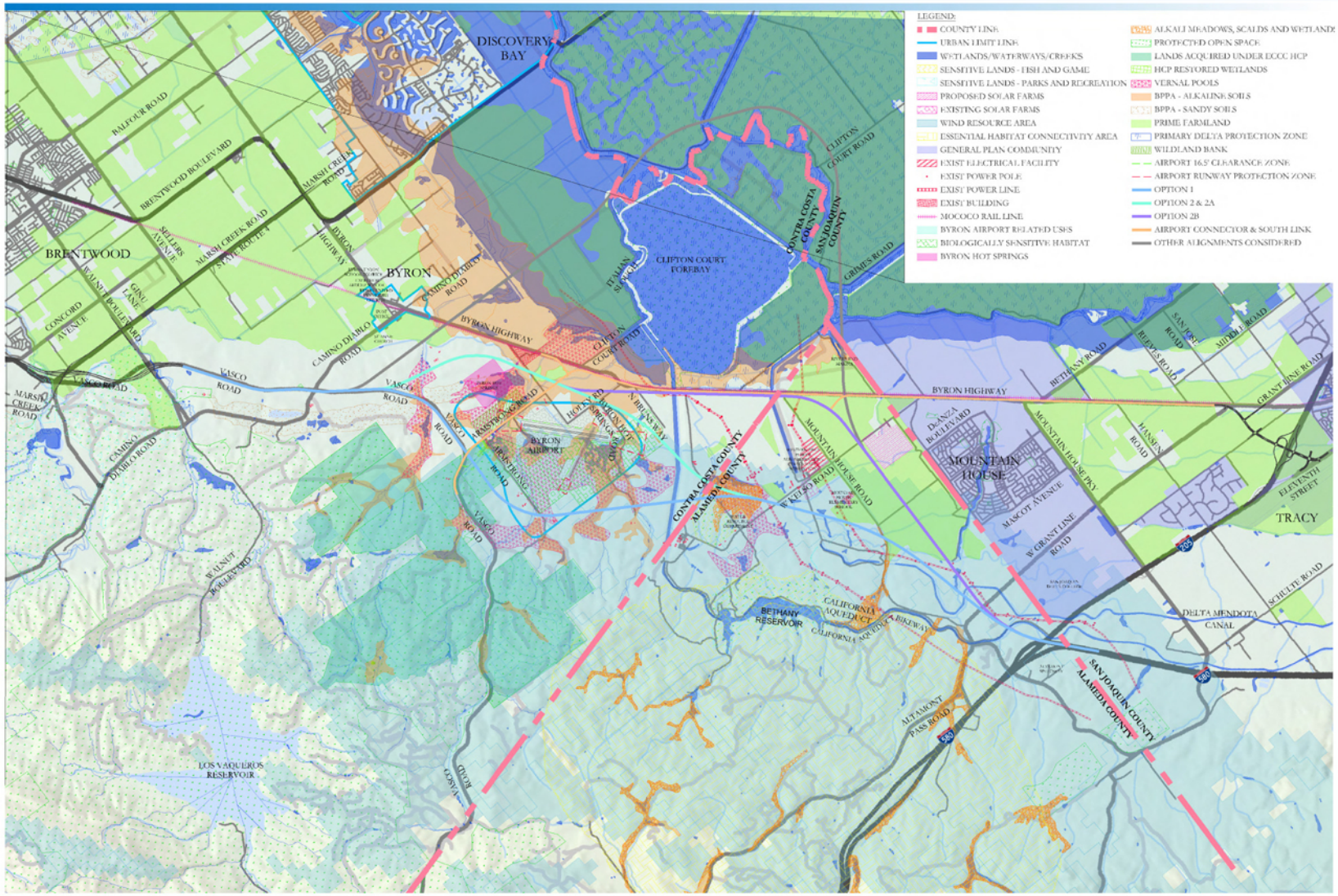
The I-580 Link Option 1 would impact sensitive habitats around Byron Airport, resulting in habitat fragmentation. In addition, both the I-580 Link Option 1 and the I-580 Link Option 2a would pass through an alkaline scald/meadow/wetland area east of Bruns Road that is a high priority for conservation efforts due to the presence of several sensitive species and the rarity of this habitat. The I-580 Link Option 2b alignment would avoid alkaline wetlands and meadows; therefore, it would have a lesser impact.

7.2.1.2 Special-Status Wildlife and Plant Species Habitat

Special-Status Wildlife Species

The I-580 Link Option 1 alignment would displace the greatest amount of these critical habitat areas. The San Joaquin kit fox has been documented throughout the region in which all alignments are located, with the greatest density of recorded sitings near the I-580 Link Option 1 and North Link Option 1 alignments.

Figure 7.1-1: Corridor Considerations



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Special-Status Plant Species

Two preconstruction surveys, over two blooming seasons, for each species with potential to occur in the study area are expected to be necessary to further determine the presence or absence of each rare plant species. Should special-status plant species be found within the impact area of the selected alignment, they would need to be avoided or relocated to suitable preserved habitat. No impact can be determined at this phase of the feasibility study.

Biological Priority Protection Areas—Alkaline Soils

The North Link Option 1 alignment would impact alkaline soils along approximately 3 percent of the alignment, and the North Link Option 2 alignment would impact alkaline soils along approximately 15 percent of the alignment. The I-580 Link Option 1 alignment would impact alkaline soils along approximately 10 percent of the alignment, the I-580 Link Option 2a alignment would impact alkaline soils along approximately 25 percent of the alignment, and the I-580 Link Option 2b alignment would impact alkaline soils along approximately 15 percent of the alignment. The Airport Connector and South Link alignments both have a high likelihood of affecting alkaline soils, with impacts occurring within approximately 60 percent and 20 percent of each respective alignment.

Sandy Soils

According to the data provided by the East Bay California Native Plant Society (CNPS), as well as the three counties in the region, all alignments are clear of sandy soils.

7.2.1.3 Protected Open Space or Prime Agricultural Land

The I-580 Link Options 1 and 2b and the Airport Connector would impact open space land and farmland. The North Link, South Link, and I-580 Link Option 2a would have less impact with minimal or no ROW impacts to prime farmland.

7.2.1.4 Habitat Conservation Plan Requirements

The Airport Connector and I-580 Link Option 1 would run through habitat conservation lands as laid out in the ECCC HCP/NCCP, SJMSCP, and EACCS. None of the other alignments are expected to impact habitat conservation lands as specified in these documents.

7.2.2 Waters, Wetlands, and Riparian Habitat

Portions of all of the alignments, except the South Link and I-580 Link Option 2b, would encroach on vernal pool ecosystems. The I-580 Link Option 1 alignment would bisect the western lobe of this critical habitat area. All of the I-580 Link alignments would cross through

alkaline wetlands near Bruns Road. Furthermore, the I-580 Link alignments and North Link alignments would impact alkaline wetlands near Byron Airport. The I-580 Link Option 2b alignment would cross areas of human-made canals, wetlands, and discontinuous riparian habitat, but the alignment would avoid alkaline wetlands and meadows.

7.2.3 Water Resources

The study area includes the California Aqueduct, the Delta Mendota Canal, Clifton Court Forebay, Los Vaqueros Reservoir, Bethany Reservoir, and the Italian Slough. The number of creek crossings for each alignment option is listed in Table 7.2-1.

Table 7.2-1 Potential Creek Crossings in the Study Area

Corridor Elements and Alignment Options	Number of Creek Crossings
North Link Option 1	4
North Link Option 2	7
Airport Connector	7
South Link	9
I-580 Link Option 1	18
I-580 Link Option 2a	15
I-580 Link Option 2b	10

7.2.4 Cultural Resources

A cultural resource analysis of the TriLink study area was conducted, as described in Chapter 5. The results from this analysis were used to evaluate the alignment options based on potential impacts to archaeological and historical sites. The results are summarized in Table 7.3-1.

7.2.4.1 Archaeological Sites

The Airport Connector Link has several archaeological sites within its alignment footprint. The I-580 Link Option 1 alignment also has one documented site within its footprint. These sites would need to be avoided during project design or mitigated prior to construction.

The North Link Options 1 and 2 have several known archaeological sites within 0.25-mile of the alignment; it should be possible to avoid impacts to these sites during project design and construction. All of the other alignments have no known archaeological sites inside of or within 0.25-mile of the alignment.

7.2.4.2 Historical Built Resources

The South Link has several recorded historical built resources within the alignment footprint. The I-580 Link Options 1, 2a, and 2b each have one recorded built resource within the alignment footprint. These resources would need to be avoided during project design or mitigated prior to construction.

The Airport Connector Link would have at least one resource within 0.25-mile of the alignment; it should be possible to avoid impacts to these sites during project design and construction.

There are no known historical resources inside of or within 0.25-mile of the footprint of the other alignments.

7.2.5 Existing Infrastructure

The alignments were developed to minimize potential impacts to existing infrastructure whenever possible. The existing infrastructure evaluated includes surface-visible utilities, such as power lines, solar farms, wind resources, Byron Airport facilities, and the UPRR Mococo Line.

7.2.5.1 Power Lines/Poles/Electrical Facilities

All of the alignments avoid the existing Western Area Power Administration Tracy East Substation. Existing power lines run across the proposed alternatives for the I-580 Link, which would require the relocation of existing power lines/poles. The North Link, South Link, and Airport Connector all have no apparent impact on existing power poles.

7.2.5.2 Solar Farms

All of the alignments are clear of the existing Greenvolts solar farm; however, Greenvolts' access comes from West Kelso Road. With the addition of an overpass at West Kelso Road, the I-580 Option 1, Option 2a, and Option 2b alignments that run on either side of Greenvolts (approximately 0.25-mile and 0.75-mile away, respectively) should have no discernible impact. If an overpass was not added at West Kelso Road, access would be impacted by the I-580 Link alignments. All of the other alignments have no known impact.

7.2.5.3 Wind Resource Area

Most of the hills in northeast Alameda County, southeast Contra Costa County, and the western edge of San Joaquin County are within a designated wind resource area. Only the North Link and South Link are clear of conflict with the Wind Resource Area. All of the I-580 Link alignments and the Airport Connector would impact Wind Resource Area property.

7.2.5.4 Byron Airport Runway Protection Zone

Only the Airport Connector Link contains infrastructure that would pass through the RPZ cones as specified by The Byron Airport Land Use and Airport Property Drawing (2005). All other alignments would have no conflict. In addition, no alignments would have conflict with planned land uses around the airport.

7.2.5.5 Union Pacific Railroad Mococo Line

The Airport Connector and South Link would include new improvements to the existing roadway section that parallels the UPRR Mococo Line, as well as several bridges over the railroad. Although these should not impact the existing train schedule, there would be some ROW impacts at these locations. All of the other alignments are clear of the railroad's ROW and would have no impact.

7.2.6 Planned Infrastructure

The alignments were developed to minimize potential impacts with planned infrastructure whenever possible. The planned infrastructure evaluated includes solar farms and planned development communities.

7.2.6.1 Solar Farms

The I-580 Link Option 2b runs adjacent to the proposed Cool Earth solar facility to be located at the southwest corner of West Kelso Road and Patterson Park Road, roughly 0.75-mile east of Greenvolts Solar Farm. Provided that an overpass is included for West Kelso Road, access to the facility would not be impacted. All other alignments appear to have no impact to the location or access for the proposed Cool Earth Solar Farm.

7.2.6.2 Planned Communities

The TriLink alignments would provide connections to planned communities within the study area. Only the South Link alignment would run through the planned community of Mountain House. The proposed South Link design would be consistent with existing Mountain House plans and would affect existing ROW along existing Byron Highway through the Mountain House CSD. All of the other alignments do not pass though planned communities.

7.2.7 Construction Cost

The Study Team prepared conceptual cost estimates for each of the four corridor elements and their optional alignments, based on similar projects constructed within the last few years. Factors contributing to the cost for a particular alignment include infrastructure construction

costs (i.e., roadway, bridge overcrossings, interchanges), ROW acquisition, utility relocation, and environmental mitigation. These were used as an additional consideration for evaluation.

Based on preliminary cost estimates, it appears that the North Link Option 2 would be roughly 50 percent more costly than the North Link Option 1, due to additional ROW required and lack of existing infrastructure for the southern portion of the alignment.

For the I-580 Link, Option 2b would have the lowest construction cost, and Option 1 would have the highest cost. Because the I-580 Link would require all new ROW and construction, the variance in cost between the options is much less than between the two North Link options. For a more detailed summary of the cost estimates, see Section 6.4.

7.2.8 Right-of-Way Impacts

The TriLink alignments would require acquisition of new ROW. Where possible, the TriLink alignments would use existing infrastructure and ROW to minimize cost and relocations.

The additional ROW required for each alignment was calculated and used to evaluate the four corridor elements and their optional alignments. There are three factors to ROW impacts—usability of existing roadway infrastructure, full and partial property acquisitions, and overall facility footprint.

The North Link Option 1 would have less property acquisition impact than Option 2 because its alignment uses mostly existing Vasco Road ROW north of Armstrong Road and the overall facility footprint is minimized. The North Link Option 2 would require acquisition of new ROW where it splits from Vasco Road and turns east of the Byron Airport. All of the options for the I-580 Link would have a very high ROW impact. All three potential alignments are based on entirely new construction (i.e., no existing infrastructure), with substantial property acquisitions. However, the overall facility footprint and new ROW would be less for Option 2b than for Options 1 and 2a.

The Airport Connector Link would include improving and widening existing Armstrong Road, as well as new construction for nearly half of the Link. The alignment would use existing infrastructure and ROW, along with several new property acquisitions.

Although much of the South Link would include improvements to existing Byron Highway, widening nearly the entire length from the proposed interchange with the Airport Connector in the north to the new Lammers Road/Eleventh Street interchange in Tracy adds a significant amount of new ROW to this link.

7.2.9 Engineering

Grade separations, constructability, design standards, and geotechnical and geologic constraints were all considered in the development of the TriLink alignments. These are described below.

7.2.9.1 Grade Separations

Grade separations would be necessary at any arterial road that TriLink would cross, along with crossings at waterways and with the UPRR Mococo Line. These would require bridge structures and earthwork fill material, both of which increase construction cost.

The I-580 Link Option 1 alignment would require more grade separations than Options 2a and 2b. The two North Link options would require similar numbers of grade separations. The South Link would also require some grade separations, while there would be few if any grade separations on the Airport Connector Link.

7.2.9.2 Constructability

Each TriLink alignment was evaluated on the basis of the complexity of its construction. The I-580 Link Option 1 and Option 2b were found to pose more complications with regard to terrain, water crossings, and existing infrastructure than Option 2a, so an increased cost was applied to these options. Option 2b was found to be the least costly among the I-580 Link alignment options.

7.2.9.3 Geotechnical Considerations

A preliminary geotechnical and geologic constraints evaluation was conducted for the TriLink study area, which provided information on site geology, seismicity, and faulting and the possibility of landslides. See Section 5.5 for details on the evaluation.

There are no known geologic hazards within the study area that would preclude the proposed development of the TriLink project; however, there are concerns, including the presence of potentially highly expansive soils, a potentially high water table, the possibility of adverse bedding in the roadway cut slopes, the possible impacts of active landslides to the proposed alignment, and exposure to strong ground shaking from nearby faults. None of the alignments are more susceptible to these conditions than are any of the others.

7.3 Summary of Results

Table 7.3-1 summarizes the alignment evaluation results described in Section 7.2 for the various options under consideration for the North Link and the I-580 Link. As shown in Table 7.3-1, impacts vary by alignment.

For the North Link, both Options 1 and 2 have a relatively limited number of impacts, with differing impacts for each option. On balance, Option 2 appears to have slightly fewer impacts than Option 1, but this finding could change as detailed studies are conducted.

For the I-580 Link, Option 2b appears to be preferable, particularly because of its lower degree of impact on biotic resources. However, there are a few issues, such as impacts on solar installations, where Options 1 and 2a are preferable, so no specific conclusions should be drawn without further study.

These potential impacts will be evaluated in detail in the later phases of study, before a preferred alignment option is selected.

Table 7.3-1 Alignment Evaluation Results

Considerations		Section	Alignments				
			North Link		I-580 Link		
			Option 1	Option 2	Option 1	Option 2a	Option 2b
Biological Resources	Sensitive Habitat	7.2.1.1	○	○	●	●	◐
	Special-Status Wildlife Species	7.2.1.2	●	○	●	○	○
	Special-Status Plant Species		○	○	○	○	○
	Alkaline Soils		◐	◐	◐	◐	◐
	Sandy Soils		○	○	○	○	○
	Protected Open Space or Prime Agricultural Land	7.2.1.3	◐	◐	●	◐	●
	Habitat Conservation Plan Requirements	7.2.1.4	○	○	●	○	○
	Waters, Wetlands, and Riparian Habitat (excludes water crossings for canals/ aqueducts)	7.2.2	●	●	●	●	◐

Legend:

No Discernible Impact (○), Less Impact (◐), and More Impact (●)

Table 7.3-1 Alignment Evaluation Results

Considerations		Section	Alignments				
			North Link		I-580 Link		
			Option 1	Option 2	Option 1	Option 2a	Option 2b
Creek Crossings		7.2.3	◐	◐	●	●	●
Cultural Resources	Archaeological Sites	7.2.4.1	◐	◐	●	○	○
	Historical Built Resources	7.2.4.2	○	◐	●	●	●
Existing Infrastructure	Power Lines / Poles / Electrical Facilities	7.2.5.1	○	○	◐	◐	◐
	Solar Farms	7.2.5.2	○	○	◐	◐	◐
	Wind Resource Area	7.2.5.3	○	○	●	●	●
	Byron Airport Runway Protection Zone	7.2.5.4	○	○	○	○	○
	UPRR Mococo Line	7.2.5.5	○	○	○	○	○
Planned Infrastructure	Solar Farms	7.2.6.1	○	○	○	○	◐
	Planned Communities	7.2.6.2	○	○	○	○	○
Construction Cost		7.2.7	◐	●	●	◐	◐
Right-of-Way Impacts		7.2.8	◐	●	●	●	●
Engineering	Grade Separations	7.2.9.1	◐	◐	●	◐	◐
	Constructability	7.2.9.2	○	○	◐	○	◐
	Geotechnical Considerations	7.2.9.3	○	○	○	○	○

Legend:

No Discernible Impact (○), Less Impact (◐), and More Impact (●)

Chapter 8 Proposed Implementation Scenarios

The proposed TriLink (SR 239) corridor extends into three counties and touches upon several cities and communities. Consequently, development and implementation of the TriLink corridor will involve extensive cooperation among multiple agencies. The purpose of this chapter is to review options for implementation of the proposed corridor elements and highlight the key efforts and decisions required by the sponsor agencies to properly frame the route's potential adoption, funding, design, and construction.

8.1 Organizational Structure

8.1.1 Joint Exercise of Powers

One potential option for the local jurisdictions is to enter into a joint powers agreement (JPA, or joint exercise of powers agreement [JEPA]). This is a formal, legal agreement between two or more public agencies that share a common power and want to jointly implement and build programs such as TriLink. Officials from those public agencies formally approve a cooperative arrangement. Joint powers can be thought of as a confederation of governments that work together and share resources for mutual support or common actions.

Examples of areas where JPAs are used commonly include groundwater management, road construction, habitat conservation, airport expansion, redevelopment projects, and regional transportation projects. JPAs may be used where an activity naturally transcends the boundaries of existing public authorities.

The JPA could be developed to meet the unique requirements of TriLink because there is no set formula for how governments should use their joint powers. CCTA could administer the terms of the agreement, which may be a short-term, long-term, or perpetual-service agreement. If a JPA requires substantial staff time from one member agency, but not the others, the managing agency (e.g., CCTA as sponsor) may hire extra staff to work on the joint powers project.

The JPA acronym can mean different things – joint powers agreement, joint powers agency, and joint powers authority – which may create confusion if not used carefully.

Some JPAs are cooperative arrangements among existing agencies, while others create new, separate institutions. Each are described below:

1. **Cooperative arrangements among existing agencies.** Under this type of agreement, the parties do not create a separate agency or authority. Instead, the agreement delegates to one of the parties the power and responsibility to perform some task and/or exercise some power on behalf of all the parties, usually subject to some oversight and control by a governing board or other mechanism established by the agreement.

   With this type of JPA, a member agency agrees to be responsible for delivering a service on behalf of the other member agencies. For example, Alameda and Contra Costa counties; the cities of Dublin, Livermore, Pleasanton, and San Ramon; and the Town of Danville entered into a JEPA pertaining to the Tri-Valley Transportation Development Fees for Traffic Mitigation to collect a fee on all new development to fund all or a portion of regional transportation improvement projects. Each party to the agreement has certain responsibilities, and no new entity or agency was created.

2. **New, separate institutions called joint powers agencies or joint powers authorities.** Under this type of agreement, the government agency parties contract under the Joint Exercise of Powers Act to create a new government agency – a joint powers authority or a joint powers agency. A JPA is a legal entity separate and distinct from the member agencies that created it.

   Like the first type of JPA, in which one agency administers the terms of the agreement, a joint powers agency shares powers common to the member agencies, and those powers are outlined in the JPA.

   Recent relevant examples of joint powers authorities (or agencies) include the following:

   - In 2001, the Transbay JPA, composed of several transportation boards and counties around the San Francisco Bay Area as members, was set up to design, build, operate, and maintain an intermodal terminal and rail extension and to collaborate with the San Francisco Redevelopment Agency and City departments to create an adjacent new transit-oriented neighborhood.
   - Contra Costa County and the cities of Antioch and Brentwood created the SR 4 Bypass Authority (Authority) in 1989 through a JPA to administer and set policy for the SR 4

Bypass project, one of three projects funded by the East County Regional Transportation Fee program.

- In 2008, Stanislaus County and the cities of Modesto, Oakdale, and Riverbank created the North County Corridor Transportation Expressway JPA, to formally adopt and environmentally clear an interregional route from SR 99 to SR 108/120 east of Oakdale.
- The Capital SouthEast Connector JPA was formed in December 2006 when the cities of Elk Grove, Folsom, and Rancho Cordova, as well as El Dorado and Sacramento counties, formalized their collaboration to proceed with planning, environmental review, engineering design, and development of what was initially called the Elk Grove-Rancho Cordova-El Dorado Connector Project. Up to that point, the Sacramento Area Council of Governments had overseen the early planning stages.
- The San Joaquin Joint Powers Authority (SJJPA), formed early in 2013, manages the San Joaquin intercity passenger rail service. CCTA is 1 of 11 potential members of the proposed SJJPA. The agreement required that at least 6 potential members sign the agreement for it to go into effect.

If the agreement's terms are complex, or if one member agency cannot act on behalf of all members, forming a new government agency is the answer. This new agency typically has officials from the member agencies on its governing board. For example, three local governments formed the Belvedere-Tiburon Library Agency in July 1995 as the legal governing body of a new independent community library. Its seven-member board has three trustees appointed by the City of Belvedere, three by the Town of Tiburon, and one by the Reed Union School District. This library JPA has the same responsibilities as any public agency, including personnel, budgeting, operations, and maintenance.

CCTA could establish a JPA specifically to arrange capital financing by selling bonds. These bonds would create the capital needed to finance TriLink construction. This type of JPA is called a public financing authority (PFA). PFAs include agencies formed to fund capital projects, such as the Berkeley Joint PFA, which resulted from an agreement between the City of Berkeley and the Berkeley Redevelopment Agency. Bonds issued by this JPA provided the capital to build public facilities, and the costs are being paid back over time by the JPA and from the revenue generated by the projects.

The new organization may not necessarily include "joint powers" or "JPA" in its name. Yet, if a public organization relies on a JPA, the organization is a JPA, regardless of its title. JPAs are not special districts, redevelopment agencies, or nonprofit corporations, although these agencies can enter into JPAs.

A JPA is distinct from the member authorities; it has separate operating boards of directors, typically composed of officials from the member agencies. The board can be given any of the powers inherent in all of the participating agencies. The authorizing agreement states the powers that the new authority will be allowed to exercise. The term, membership, and standing orders of the board of the authority must also be specified. The joint authority may employ staff and establish policies independently of the constituent authorities.

8.1.1.1 Statutory Authority

The local agencies would get their authority to work together from a State law called the Joint Exercise of Powers Act. The JPA would be able to exercise only those powers that are common to their member agencies. For example, three fire protection districts and an adjacent city can form a JPA to run a fire department because each member agency has the power to run a fire department; however, this same JPA cannot maintain the local parks because fire districts lack that statutory authority.

Joint powers agency's meetings are open to the public and subject to the Brown Act. Furthermore, JPAs must follow the Public Records Act, the Political Reform Act, and other public interest laws that ensure political transparency.

The formation of a JPA begins when public officials negotiate a formal agreement that spells out the member agencies' intentions, the powers that they will share, and other mutually acceptable conditions that define the intergovernmental arrangement. It will provide the method by which the purpose will be accomplished or the manner in which the power will be exercised. Each member agency's governing body then approves the JPA.

If a JPA creates a new joint powers agency, the JPA must file a Notice of a Joint Powers Agreement with the Secretary of State. Until public officials file those documents, a JPA cannot incur any debts, liabilities, or obligations, or exercise any of its powers.

An agreement that creates a new joint powers agency describes the size, structure, and membership of the JPA's governing board and documents the JPA's powers and functions. As a legally separate public agency, the JPA can sue or be sued, hire staff, obtain financing to build public facilities, and manage property. JPAs usually protect their member agencies from a JPA's debts or other liabilities.

8.1.1.2 Forming a JPA

The process to form a JPA is simple.

a. Participating agencies negotiate the terms of the agreement;
b. Each participant agency approves and executes a JPA; and
c. JPA files a notice with the Secretary of State and a statement of information with the Secretary of State and the County Clerk. After the formation of the authority, there would be several start-up related actions to be undertaken.

8.1.2 Memorandum of Understanding

A Memorandum of Understanding (MOU) is also a potential option for TriLink. An MOU is a document describing a bilateral or multilateral agreement between two or more parties. It expresses an agreement between the parties, indicating an intended common line of action. It is often used in cases where parties either do not imply a legal commitment or in situations where the parties cannot create a legally enforceable agreement. MOUs specify mutually accepted expectations between two or more people or organizations as they work together toward a common objective. Generally, they are not legally binding, in part because neither party wants to deal with the ramifications of a binding agreement, nor do they involve the exchange of money. In these kinds of situations, an MOU is an appealing option because it is simple and direct, without complex and combative standard terms and conditions of contract law.

Although each side must put some thought into the MOU, the process for creating one is pretty straightforward. Generally, each party starts in a planning stage to determine what they want or need the other party to provide, what they have to offer, what they are willing to negotiate, and the rationale for an MOU. Most important, the MOU spells out the parties' common objectives.

Other specific terms of the agreement are usually included too, such as when the agreement begins, how long it lasts, and how one or both entities can terminate the MOU. An MOU can also have disclaimers and restrictions, as well as privacy statements. Once they come to an agreement on those details, all parties sign the MOU.

Local examples of MOUs include the following:

- CCTA and Contra Costa County executed an MOU that assigns responsibilities to CCTA that previously were the County's for this TriLink study.

- Caltrans has an MOU with FHWA that allows the Secretary of Transportation to assign, and the State of California to assume, responsibility for one or more highway projects within the State. For these projects, the State may also be assigned FHWA's responsibilities for environmental consultation and coordination under other federal environmental laws. By statute, the State is deemed to be a federal agency for these assigned responsibilities.
- Under an MOU with CCTA and the East Contra Costa Regional Fee and Finance Authority, CCTA has assumed responsibility for the Balfour Road interchange final design services and utility relocation.

8.1.3 Participants and Leadership Sponsor

With Caltrans and the local agencies – Contra Costa County, CCTA, Alameda County, San Joaquin County, SJCOG, Alameda CTC, the City of Brentwood, and the City of Tracy – as potential partners, there are a few scenarios of leadership:

Lead Agency	Advantages	Disadvantages*
CCTA	Retain local control on schedule, assignment of resources; can rally resources through use of consultants and/or local agencies.	Under some innovative financing laws or project delivery methods, only Caltrans can act as sponsor.
Caltrans	Increases potential to employ innovative project delivery methods without special legislation.	Loss of local control; subject to resource availability and other Caltrans commitments.
Alameda CTC	Resources readily available through use of consultants and/or local agency staff.	Project is not high priority to Alameda CTC, thus subject to political will. Under some innovative financing laws or project delivery methods, only Caltrans can act as sponsor.
SJCOG	Resources readily available through use of consultants and/or local agency staff.	Loss of local control; subject to resource availability and other SJCOG commitments.

* Refer to Section 8.2.2 for details on innovative financing laws and project delivery methods.

8.2 Project Delivery Methods

8.2.1 Public Capital Delivery (Traditional Outlay)

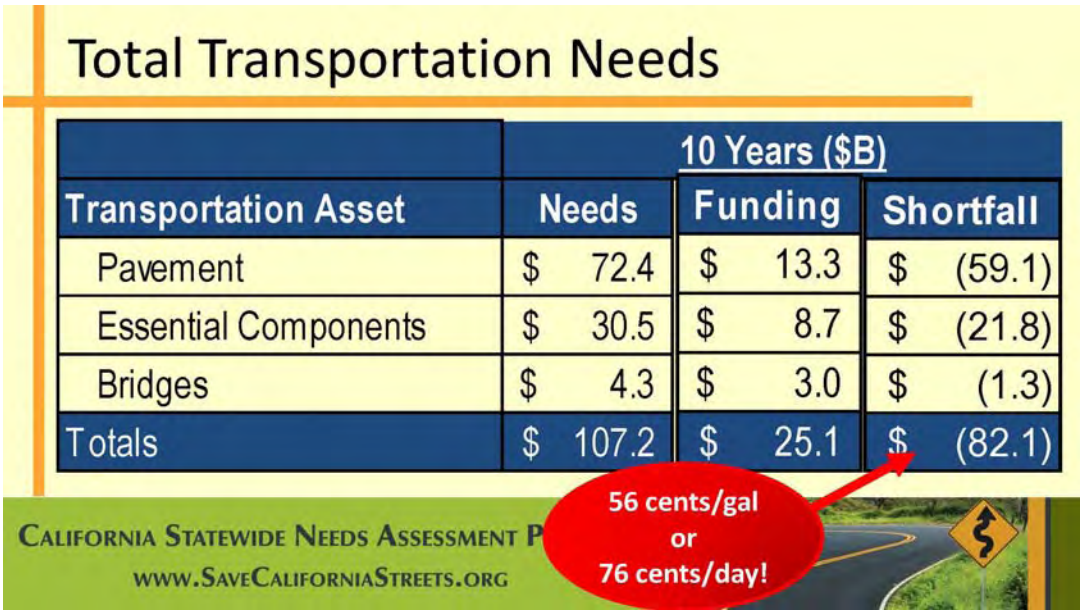
The features, modes, and potential benefits of the TriLink corridor elements make it eligible for a variety of local, State, and federal funding sources; however, California's transportation system is facing what many believe to be a funding crisis. Given current funding projections and, without action at federal, State, or local levels, public transportation funds will be a challenging source to tap into for development of the TriLink alignments. Nevertheless, public transportation funds may play a critical part in the project's overall future funding scheme. The information below provides a summary/snapshot of public funds available to the project and limitations and/or opportunities of each. What follows is a brief overview of the current transportation funding outlook and the revenue capacity for transportation systems at various levels of government.

8.2.1.1 State Highway, Local Roadways, and Public Infrastructure Needs

While there have been many studies and analyses that document the aforementioned transportation funding crisis, ranging from numerous private sector reports to public agency documentation, the recently completed Statewide Local Streets and Roads Needs Assessment, prepared under the direction of the California Transportation Commission, is the most recent and comprehensive overview of this situation. While the document covers a broad range of transportation system components, it also provides the capacity to focus in and understand the nature of the challenge confronting State highway, local roadway, and public transit infrastructure needs.

According to the Needs Assessment Final Report (January 2013), "…The total cost of all system preservation, system management, and system expansion projects during the 10-year study period is nearly $538.1 billion. Of this total, the cost of system preservation projects (both rehabilitation projects and maintenance costs) during the study period is $341.1 billion, with the cost of system management projects and system expansion projects over the same period estimated at $197 billion." The California Transportation Commission report cites the estimated revenue from all sources during the 10-year study period at a projected $242.4 billion, which represents approximately 45 percent of the overall estimated costs of projects and programs that were identified in the needs analysis, and an estimated shortfall of approximately $295.7 billion over the 10-year period. Figure 8.2-1 provides an example of the critical funding needs for a small portion of the overall transportation segment in California.

Figure 8.2-1 California's Transportation Funding Needs for Three Key Assets



Source: California Statewide Local Streets and Roads Needs Assessment, 2012 Update Presentation (March 1, 2013, Public Works Officer's Institute, Pasadena, CA).

The California Transportation Commission, in its 2012 Annual Report to the Legislature, made the following assessments of key major revenue sources, which were incorporated in the 2012 State Transportation Improvement Program (STIP) development process:

- Fuel Excise Tax revenues will not grow through 2012. Then, starting in 2013 and continuing through 2016-17, revenues will increase by approximately 1.8 percent for gasoline and 2.8 percent for diesel each year.
- Weight fee revenues produced from assessments on commercial vehicles remained flat from 2010-11 through 2012. Starting in 2013 and continuing through 2016-17, weight fee revenues will increase by their 10-year growth rate of 2.3 percent.
- Federal Obligation Authority (OA) will remain at the 2008-09 level of $3.0 billion. Federal Fiscal Year (FY) 2010 was the last year of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and the level of funding it had provided is assumed to continue as a constant through the STIP development period.
- The approval of MAP-21 (Moving Ahead for Progress in the 21st Century) in 2012 essentially extended the SAFETEA-LU funding level for 2 years, consistent with the California Transportation Commission projections. The California Transportation Commission projected that California's share of the annual August redistribution of federal OA is

assumed to be $109 million per year based on the average received from 2007-08 through 2009-10.

- No pre-Proposition 42 loan repayments will occur over the STIP development period, and other loan repayments will occur in the year consistent with State statute, which is closer to the end of the decade.

These facts all indicate that State and federal funding streams available to preserve transportation systems have not kept pace with the demands on them.

8.2.1.2 Revenue

Local Revenues

Local transportation programs, ranging from roadways to public transportation, rely on a variety of sources of public revenue. These range from a statewide 0.25 percent tax on the sale of all goods and services for transit purposes; additional locally approved sales taxes, frequently found in the largest urbanized counties in 0.50 percent increments; a very limited amount of local property taxes in specific instances; and transit fares.

Contra Costa County, along with Alameda and San Joaquin counties, benefits from belonging to the family of Self Help Counties, which are those counties with dedicated funding provided from voter-approved local sales tax revenues. For Contra Costa County, the revenues from this source come from Measure J, which provided for the continuation of the county's half-cent transportation sales tax for 25 more years beyond the original expiration date of 2009. Measure J has contributed to local priority projects such as the additional bore in the Caldecott Tunnel on SR 24, development of eBART, improvements to SR 4, and I-680, as well as city and road funding to the communities in the county. The 2012 California Transportation Commission report indicates that, “Local funds account for about 65 percent ($158.4 billion) of all revenues for transportation infrastructure in California.”

In Contra Costa, for example, the voters approved a $2 billion Transportation Expenditure Plan (TEP) in 2004. In Alameda County, Measure B, passed in 1990, generates more than $1.4 billion in revenues. San Joaquin’s Measure K, which was renewed and extended by the voters in 2006, will generate $2.6 billion over 30 years. Although none of these sales tax measures included funding for TriLink, future sales tax measures in each of the three counties could provide a source of new transportation funding.

Subregional Transportation Mitigation Program (STMP)

An STMP would establish developer mitigation fees or other mitigations derived from new housing and employment development in the TriLink study area. Both Contra Costa County and San Joaquin County already have STMPs at the local and regional level. These programs have garnered more than $200 million in transportation revenues. The STMP would be developed based on future growth in households and jobs, the potential traffic impacts of that growth, and the cost of mitigating those impacts. The potential for an STMP hinges on the ability to establish a "nexus" between future growth, traffic impacts, and mitigations. The nexus must create a reasonable relationship between planned growth, impacts, and proposed mitigations. The Study Team considered these factors when estimating the capacity for a proposed subregional mitigation fee.

Applying the current Eastern Contra Costa Regional Fee and Financing Authority (ECCRFFA) proportions to the expected development in the study area[27] could yield as much as $260 million of total funding for TriLink improvements.[28]

State Funds

Funds at the State level available for transportation systems are generated from a State excise tax on gasoline and diesel fuels and weight fees imposed on commercial vehicles. The California Transportation Commission Needs Assessment Final Report indicates that…"State revenues provide about 22 percent ($53.1 billion) of the total funds devoted to transportation infrastructure." STIP funds, allocated by the California Transportation Commission, are the primary source of State funds for highway expansion projects.

SB 802 (Torlakson; Chapter 598, Statutes of 2003) added unconstructed State Highway Route 239 to the statutory list of interregional and intercounty routes specified in the statute, which in turn, authorizes the route, if adopted at some point into the State Highway System, to be eligible for State funding in the Interregional Transportation Improvement Program (ITIP).

As mandated through passage of SB 45 (1997), the ITIP is the 25 percent reservation of STIP resources under direct programming control of Caltrans for purposes of interregional

[27] Development projections used for transportation modeling, based on a modified version of ABAG's Projections 2009, indicate that 59,300 new housing units and 30 million new square feet of workplace development (i.e., industrial, office, and retail) are expected in eastern Contra Costa and western San Joaquin counties between 2010 and 2040.

[28] Further analysis is needed to develop a nexus between forecast development of new households and jobs in the study area, the traffic and resulting congestion that it could generate, the extent to which the proposed TriLink improvements would mitigate that congestion, and the share of Tri-Link costs that can be fairly assigned to new development.

transportation improvements and is subject to approval by the California Transportation Commission. The interregional road system (IRRS) serves the movement of people and goods between regions and consists of a list of the State highway routes included in the system. There are 93 IRRS routes (out of 265 total State highways) in statute, 7 of which were added by legislation (in the manner of SR 239) since the original system plan was developed. The IRRS serves functionally as the "feeder" system for the programming of funds by Caltrans on State priorities in the ITIP.

As previously mentioned, the State resources available for the STIP, and therefore the ITIP, are severely restricted looking forward. For example, current estimates are that between $20 million and $30 million in RTIP funds will be available countywide in Contra Costa for FY 2017-18 and FY 2018-19. With an estimate of $630 million to $770 million for the TriLink corridor improvements, this amount represents a tiny fraction of funding necessary to deliver the project. Consequently, unless substantial new revenue resources are made available to support the STIP, the potential advantage of legislatively designating SR 239 as part of the State IRRS is yet to be determined.

Federal Funds

State and local transportation agencies enjoy the benefit of annual allotments from the federal government, based on formula distributions from federal taxes on fuels. If federal funding remains at today's levels, which is an open question as we look forward to future federal reauthorization legislation, the State of California is projected to receive $30.9 billion in federal transportation funds over the next 10 years.[29] This amounts to 13 percent of total funding to the State's transportation system. The 2012 approval of MAP-21 offers little to this observation and assumption, as it roughly extended the authorized amount of federal revenues as previously existed under the prior program authorization.

Discretionary funding opportunities, such as those provided for in the TIGER program, offer an additional fund source for regionally significant projects such as TriLink. These funds are highly competitive, with approximately $474 million available nationwide in 2013. The long-term continuation of this program is uncertain and, coupled with the grant's primary focus to administer funds to "shovel ready" projects, SR 239's competitiveness in this program may be several years away.

[29] "Federal Transportation Funding: How Does It Work and What Will the New Transportation Act Mean for California?" from "Policy Matters," California Senate Office of Research, January 2012, page 7.

8.2.2 Public-Private Capital Delivery

Throughout the world, in all types of infrastructure, owners and operators have turned to innovative project delivery and financing methods to meet their mobility challenges. On project delivery, this includes use of design-build, construction management at risk, and construction manager/general contractor methods to provide more rapid project delivery, reduce project costs, and transfer risks from the public to the private sector. These approaches not only speed up the actual construction of projects, but in most cases take advantage of the inherent innovation of the private sector entities.

In a similar vein, private financing of projects, in any number of forms, is widely used throughout the world. Combined with the more modern delivery methods, private financing provides project sponsors and owners with cost-effective and timely implementation. With a solid source of revenues identified, private funding under contract with the public entity further provides the opportunity for the developer team to exhibit innovation on behalf of the public entity sponsor.

Under present State law, the State and various local transportation agencies have access to three specific means of innovative financing for their projects – public-private partnerships (P3); California Transportation Financing Authority; and Infrastructure Financing – while having little or no access to the authorized two modern delivery methods – construction manager/general contractor and design-build. The following sections include a detailed assessment of each of these tools, including applicability to TriLink, and Table 8.2-1 provides a summary assessment of each.

8.2.2.1 Innovative Financing

Although the California Transportation Commission report did not incorporate an analysis of the amounts of private funds that have been “invested” in transportation projects, there are several examples of the use of legislatively enacted authority for projects to be developed under private funding.

Public-Private Partnership (P3)

State law authorizes Caltrans and regional transportation agencies to enter into an unlimited number of comprehensive lease agreements with public or private entities to develop P3 transportation projects, until January 1, 2017. S&H Section 143 provides that P3 projects and associated lease agreements proposed by Caltrans or a regional transportation agency shall be submitted to the review and approval by the California Transportation Commission, and that the Commission shall select and approve the projects before Caltrans or a regional agency begins a public review process leading to a final lease agreement.

Table 8.2-1 Assessment of Current California Innovative Finance Laws and Innovative Project Delivery Methods

Statutory Authority	Qualified Sponsor Defined	Eligible Project Types Defined	Tolling or User Fee Included or Authorized?	Bonding Authority Included?	Project Delivery Method Allowed	Approval Process	Project Quantity Limits	Sunset Date	Other Known Issues with Specific Law	Suitability for SR 239/ TriLink	Limitations
Innovative Financing											
Infrastructure Financing: Assembly Bill (AB) 2660 ('96), *GC 5956, et seq.*	City, county, city and county, including a chartered city or county, school district, community college district, public district, county board of education, joint powers authority, transportation commission or authority, or any other public or municipal corporation.	Includes local or regional - sponsored highways, bridges and tunnels. Specifically excludes applicability of state agencies implementing projects on State Highway System.	Requires user-fee revenues to support development and operation of a project. User-fee (presumed to include tolls) is authorized under GC 5956.6(b)(4).	Project sponsor may use private financing as the exclusive revenue source or as a supplemental revenue source with federal or local funds.	No transportation design-build or other delivery tool specified in the organic statues for roadway projects. Innovative delivery options must be derived from other existing laws.	Discretion provided to qualified sponsors.	Without limit.	None.	Issues that have arisen in the implementation of this act include the following: 1) Is 100% private financing always required, or can governmental agencies contribute financing as well? 2) Must the financing always be in the form of equity (cash) or could contributions include loans, carrying costs, assumptions of risks, or any combination thereof? 3) Several terms generated confusion. For example, does "agreement" include a "license?" 4) Concern arose that the limitation on lease/operation period was too short, and that the statute was ambiguous as to whether leasing to a private entity is allowed ("may") or required ("shall").	1) County or a transportation authority may implement. 2) As an unadopted state highway segment SR 239, this financing authority would work here, if user fee based. 3) Attempts to "fix" financial provisions (highlighted in previous adjacent column) have all failed due to opposition of local public labor. 4) No intrinsic authority for use of design-build; AB 401, 2013, would permit a JPA or CCTA to use design-build on a voter-approved "expressway" project.	1) No limitation or requirement for alternative routes. 2) The law covers wide range of types of infrastructure, so there is no focus on requirements specific to each type (drainage, flood, etc.) 3) Cannot be used to implement a State highway project.

Table 8.2-1 Assessment of Current California Innovative Finance Laws and Innovative Project Delivery Methods

Statutory Authority	Qualified Sponsor Defined	Eligible Project Types Defined	Tolling or User Fee Included or Authorized?	Bonding Authority Included?	Project Delivery Method Allowed	Approval Process	Project Quantity Limits	Sunset Date	Other Known Issues with Specific Law	Suitability for SR 239/ TriLink	Limitations
P3: SB xx4 ('09) *S&H 143*	Transportation planning agency as defined in statute. A county transportation commission. Any other local entity that is designated by statute as a regional transportation agency. A JPA, with the consent of the affiliated transportation planning agency or a county transportation commission (southern California only).	Highway, public street, rail, related facilities supplemental to existing facilities currently owned by the department or regional agencies.	Authorizes comprehensive lease agreements, specifically including authority to impose tolls. The state has expanded the types of revenues that may apply. Tolling authority: S&H 143 (j)(2).	Definition of transportation project specifically incorporates financing as an approved element of an agreement.	Design-build specifically permitted, without limit, cross referenced to expired PCC 6800, *et seq.*	CTC governs the approval process. Prior to CTC approval, the sponsor must submit a Project Proposal report that addresses a series of factors. Following CTC selection of project, sponsor must also submit final lease to PIAC and legislature at least 60 days before it is effective.	Without limit.	1/1/2017		1) Neither County nor CCTA may be sponsor. 2) A JPA may sponsor, with approval of MTC. 3) Meets project type and tolling authority requirements for the project. 4) Approval process is protracted and time is running out under the 2017 sunset date. 5) Incorporates design-build as an approved component. 6) CTC approval will necessarily require community interest.	1) S&H 143(i) says contract may not infringe on right of state/local to implement projects. 2) Contract may permit compensation for impacts on revenues, except for project in RTP, safety projects, incidental capacity increase project, adding high-occupancy vehicle (HOV) or converting high-occupancy toll (HOT) lanes, projects outside boundaries defined in lease agreement. 3) The latter provision would permit the sponsor to define any restrictions on parallel capacity, or not.

Table 8.2-1 Assessment of Current California Innovative Finance Laws and Innovative Project Delivery Methods

Statutory Authority	Qualified Sponsor Defined	Eligible Project Types Defined	Tolling or User Fee Included or Authorized?	Bonding Authority Included?	Project Delivery Method Allowed	Approval Process	Project Quantity Limits	Sunset Date	Other Known Issues with Specific Law	Suitability for SR 239/ TriLink	Limitations
California Transport Financing Authority (CTFA): AB 798 ('09), *GC 64100, et seq.*	Caltrans or a regional transportation planning agency. JPA allowed. Any other local entity designated as regional transportation agency. Includes as eligible sponsor a Congestion Management Agency (CMA) in the Bay Area or a CTC in southern California.	Highway, public street, rail, bus, or related facilities, supplemental to existing facilities currently owned and operated by Caltrans or project sponsor. For highway projects, the road segment must be on the State Highway System; tolls not permitted for local street or road project.	Tolls, on facilities where not otherwise prohibited by Statute, collected by a project sponsor with the approval of CTFA. *GC 64112*	In addition to tolls, sponsor may also pledge variety of local transportation funds, including, but not limited to, fuel taxes, local transportation sales taxes, other state revenues approved for this purpose by the Legislature or by initiative, and developer fees.	None specified in the organic statutes.	The CTFA and CTC must use an approval process that results in project approval by both agencies in a manner that is not sequential, so that both approvals may occur at the same time. To date, the joint CTC/CTFA approval policy has not been adopted.	Without limit.	None.	1) Thus far, administered on ad hoc basis, for a single project (MTC HOT Lanes). 2) No guidelines for approval process yet. 3) Local road toll prohibition is a challenge.	1) CMA or a JPA may sponsor. 2) Not applicable to local road projects, so this would have to be addressed through separate legislation. 3) No intrinsic authority for use of design-build; however, approval of AB 401, 2013, opens the door to regional entities or the State seeking CTFA approvals on projects.	1) For project with tolls, this law requires non-tolled alternative lanes in same corridor. 2) Also, prohibits conversion of non-tolled to tolled lanes.

Table 8.2-1 Assessment of Current California Innovative Finance Laws and Innovative Project Delivery Methods

Statutory Authority	Qualified Sponsor Defined	Eligible Project Types Defined	Tolling or User Fee Included or Authorized?	Bonding Authority Included?	Project Delivery Method Allowed	Approval Process	Project Quantity Limits	Sunset Date	Other Known Issues with Specific Law	Suitability for SR 239/ TriLink	Limitations
Innovative Delivery Tools											
Construction Manager/ General Contractor (CM/GC): *PCC 6700*	Caltrans	Highway, bridge, or tunnel.	N/A	N/A	N/A	N/A	Six demo projects to be administered by Caltrans, with at least three costing in excess of $30 million.	None.	Limited to Caltrans.	Limitation to six Caltrans projects takes this delivery mechanism out of play without a legislative fix.	
Design-Build: PCC 6800 *et seq.* expires 1/1/2104. Replaced and expanded by new PCC 6820, *et seq.*	New AB 401 project sponsor definition now includes the following: Caltrans or local agency defined to include CMAs, Metropolitan Planning Organization (MPO), statutorily designated regional transportation agency, or a JPA. Cities and counties expressly prohibited as project sponsor.	Ten state highway, bridge, or tunnel projects. Unlimited local-sponsored projects on State Highway System. If elements of SR 239 were included in a future voter-approved plan, then an expressway alternative would qualify.	N/A	N/A	N/A	N/A	New slate of 10 State highway projects. Unlimited local application.	Expiring 1/1/2014 sunset date now extended to 2024.	The County will not qualify as project sponsor, but a JPA or CCTA now qualify.	With approval of AB 401, 2013, a State highway project could "pair" new design-build authority with CTFA or Infrastructure Financing Act.	

To date, one major project, Presidio Parkway (Highway 101- Doyle Drive, San Francisco), has successfully been procured using this process and is under construction. Several major regional agencies have been striving to form a "pipeline" of qualifying projects to accelerate their delivery of local funded programs; Los Angeles County is prominent among these, where LA Metro is pushing ahead in the development of several project packages being prepared for California Transportation Commission approval in the coming year.

Pre-Development Agreement

A pre-development agreement (PDA) is an agreement, usually with a private entity or consortium, to co-develop a project. Competition is for best project development concept that provides best value to the agency. Once a PDA is signed, it is highly probable that the development team will be able to negotiate a concession or other type of P3 agreement. Under this arrangement, the developer participates directly in defining the project and reducing costs. This delivery method is accepted in multiple states, including California, and allows the procurement process to overlap with project development.

California Transportation Financing Authority

Assembly Bill (AB) 798 (Chapter 474, Statutes of 2009) established the CTFA in the Treasurer's Office. This entity has broad powers to authorize State and regional agencies to access a new innovative financing mechanism for use in addressing the State's critical infrastructure needs. Specifically, while the CTFA mandate is to meet the need for improvements for the State transportation system, consistent with the State's GHG reduction goals, air quality improvement goals, and natural resource conservation goals, CTFA is able to authorize construction of a facility through the issuance of, or the approval of the issuance of, bonds backed, in whole or in part, by specified revenue streams.

Most importantly, the CTFA may also authorize a project sponsor, or Caltrans, to impose and collect tolls as one source of revenue to pay debt service and to operate and maintain a project under certain conditions. To date, only a single project sponsor has sought access to the tolling authority inherent in the CTFA authority, that being MTC for its regional high-occupancy toll (HOT) lane system. Unfortunately, the CTFA has no authority to provide project sponsors with access to modern project delivery methods, and project sponsors must look to other statutory schemes for delivery options.

AB 2660 (Chapter 1040, Statutes of 1996)

This measure was designed to assist cities, counties, and other local jurisdictions to develop strategic, user-fee funded infrastructure for delivery and implementation by the private sector.

Specifically, the law authorizes local governmental agencies to use private sector investment capital to study, design, construct, finance, and operate fee-producing infrastructure facilities. This law also provides that the infrastructure developed by a private entity may be owned by either the private entity or the sponsoring governmental agency, and the agreement with the private entity can be subject to a lease of the facilities to, or ownership by, the private entity for a term up to 35 years.

To date, no transportation project has been brought forward under this law; however, recently, the City of Santa Paula successfully implemented a new water treatment facility under these provisions. AB 2660 does contain a proviso excluding the authority under the bill from its use for a project on the State Highway System, but local roadways, bridges, and tunnels, as well as capital projects for transit, are all eligible.

These examples underscore the principal that, in certain instances, projects may be appropriate candidates for tolling or other private financing mechanisms under P3s:

- For public toll projects, the toll agency will typically obtain construction financing by issuing bonds secured by future toll revenues.
- For toll concession P3s, including those awarded in the 1990s under Streets & Highways Code Section 143, depending on the revenue forecasts and experience, toll projects might be not only fully self-funding, but they may produce “excess” funds that will be available for other public projects in some cases; however, in contrast, there may be some cases for which toll revenue projections may form the basis of project finance that would require State and federal support.
- For availability payment P3s, such as used for the Presidio Parkway (Highway 101, San Francisco), the private sector invests capital and borrows funds to pay for construction based on a future stream of public funds.

In all cases, the use of tolling or P3s to provide project funding has the potential to free up the agency’s other sources of funding for other projects. As part of the initial stages of the TriLink feasibility study, the Study Team performed a sketch-level assessment of toll revenues and found that tolling could support approximately 25 to 30 percent of the cost of the project.

8.2.2.2 Alternative Delivery Methods

The State constitution was amended to provide specific clarification that Caltrans may use contract engineering services; however, Caltrans operates under a legislatively mandated annual limit on outside contractors. This makes the overall management of the organization

difficult as projected ebbs and flows of available funding restricts the agency's ability to match support staff with workload on a real-time basis.

Admittedly, in recent years the legislature has given the department and, in some cases, local agency partners, authority for limited use of innovative delivery and funding methods, but these are due to expire; therefore, they are subject to legislative renewal in the coming years. In contrast, many local and special transportation agencies, including those developing or funding projects on the State system itself, have more flexibility to use contract resources to meet delivery needs.

Design-Build Method

Design-build contracting is frequently used in neighboring states and throughout the world to deliver modern infrastructure. In essence, the public agency "owner" is empowered to engage a single entity (or team) that designs and builds the facility, which is then operated by the public entity. Current legislation (AB 401) has a new sunset date extended through 2024. It expands the project sponsor definition to include Caltrans, CMAs, MPOs, statutorily designated regional transportation agency, or a JPA, implying that CCTA or a JPA formed to oversee the TriLink Project could qualify as a project sponsor. Cities and counties are expressly prohibited as project sponsor. AB 401 will include a new slate of 10 projects on the State Highway System and unlimited locally sponsored projects. To date, none of the 10 "slots" have been taken. With this new legislation, a State highway project could "pair" new design-build authority CTFA or the Infrastructure Financing Act.

The renewal or expansion of the design-build authority allows project sponsors to combine design-build with any of the innovative finance options discussed above to truly make a comprehensive development proposal for priority projects. For example, the toll and revenue bond authority under CTFA would be a more powerful tool if paired with design-build authority; such an approach would conceivably provide a local sponsor with the opportunity to implement a publicly managed facility based on user fees.

There are two other design-build approaches to consider. These are discussed below.

Design-Build-Operate-Maintain

Under this method, the owner awards a contract by competitive bid following a transparent tender process. Proposers are usually required to provide a single price for the design, construction, and maintenance of the facility for whatever period of time is specified.

The advantage of this approach is that it combines responsibility for different functions – design, construction, and maintenance – under a single entity. This can result in some efficiency to private partners.

An owner must specify all standards to which it wants its facilities designed, constructed, and maintained. With this procurement, an owner relinquishes much of the control it typically possesses with more traditional project delivery.

Design-Build-Finance-Operate

This approach bundles together the design, build, finance, and operation responsibilities and transfers the package to private sector partners. This is the model closest in conceptual form to the Presidio Parkway (Doyle Drive) P3. One commonality for these projects is that they are either partly or wholly financed by debt leveraging revenue streams dedicated to the project. Although tolls are the most common revenue source, others range from lease payments to shadow tolls and vehicle registration fees.

Construction Manager/General Contractor Method

Several states, most notably Oregon, have turned to an alternative delivery method referred to as Construction Manager/General Contractor (CM/GC). Under this process, the facility owner or sponsor will be able to engage a design and construction management consultant (construction manager) to act as the department's consultant during the preconstruction phase and as the general contractor during construction. During the design phase, the construction manager acts in an advisory role providing constructability reviews, value engineering suggestions, construction estimates, and other construction-related recommendations. Later, Caltrans and the construction manager can agree that the project design has progressed to a sufficient enough point that construction may begin. The two parties then work out mutually agreeable terms and conditions for the construction contract, and, if all goes well, the construction manager becomes the general contractor and construction on the project commences, well before design is entirely complete.

This new tool was recently enacted under California law for use by Caltrans on the State Highway System in the form of a demonstration program. The law is intended to permit Caltrans to experiment with this delivery method and to report on its functionality at the conclusion of the implementation of up to six projects. Given the success in other states, it is hoped that the legislature will authorize this method for more broad application at the regional or local levels in California. Once enacted, regional or local entities could combine this delivery method with existing financing authority, such as the AB 2660 law or CTFA tolling and revenue bonding, to accelerate user fee funded projects in an efficient manner.

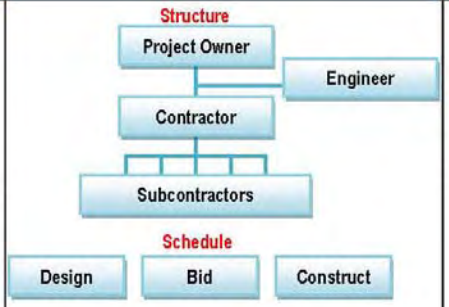
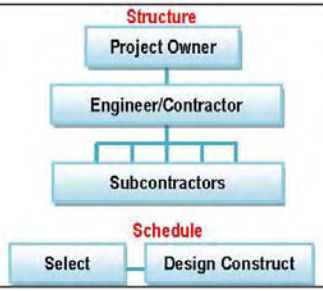
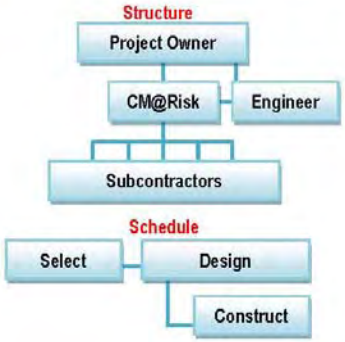
8.2.3 Comparison of Project Delivery Methods

Table 8.2-2 provides a summary of the advantages, disadvantages, and applicability to TriLink for the traditional and alternative delivery approaches.

While California provides Caltrans and, in many instances, regional or local agencies with access to a variety of innovative financing and project delivery tools, it is unclear, given the history of the legislative role in authorizing these tools, whether any of these will be available in a timeframe appropriate for use for the development of the TriLink facility. Some challenges to consider are impending sunset dates on current authority, the limitation of the CM/GC method to Caltrans and State highways only, and the resistance to innovative delivery methods.

For example, the existing P3 law sunsets in the coming years, the CM/GC method is limited to Caltrans and State highways only, and the pathway to extension or expansion is clouded by historical legislative resistance to authorizing such modern delivery methods. Clearly, to preserve the possibility of using any of these modern delivery methods, it will be necessary to either seek the extension of these laws or follow the lead of public agencies that have acted to seek their own special legislation. One encouraging factor is that current design-build authority legislation was replaced and expanded through 2024. AB 401 allows CCTA and a JPA to pursue design-build authority, and it allows “pairing” new design-build authority with other modern delivery tools. This could be a viable option for TriLink in the future.

Table 8.2-2 Project Delivery Method Comparison

Project Delivery Method	Description	Structure/Schedule	Advantages	Disadvantages/Risk	Suitability for SR 239
Design-Bid-Build	This is a linear process in which one task follows another with no overlap. Plans are developed to 100% completion and the project is advertised for bid. Contractors bid the project exactly as designed and the work is awarded to the lowest bidder.		• Traditional, well-known delivery method • Simple procurement process to manage • Defined scope • Lowest price accepted • Good for simple, uncomplicated projects that are not schedule-driven and not subject to change	• Linear process equals longer schedule • No control over contractor selection • No design or cost input from contractor • Lack of flexibility for change • Can create adversarial relationships • Not very well suited for complicated projects that are sequence, schedule or change-sensitive	• This method would work well for delivery of individual project components
Design-Build	A single entity provides for both the design and construction of the project. This usually requires plans to be at 25-30% completion, and is a non-linear process in which design and construction overlap. This usually employs a two-phase qualifications based procurement (RFQ/RFP). The Design-builder provides a lump sum bid.		• Single point of accountability for design • Enables fast-track delivery because construction begins before design is complete • Project cost defined early in the process	• Design-Build firm controls contingency • Not suited for small projects • Requires additional design effort • Change management may be expensive	• Under new legislation (AB 401), CCTA or a JPA could pursue DB authority. CC County is not authorized. • Better suited for corridor-wide program of projects
CM/GC	The facility owner or sponsor engages a design and construction management consultant to act as the department's consultant during the pre-construction phase and as the general contractor during construction.		• Early CM@Risk involvement in design • Collaborative approach, partnership • CM@Risk responsible for delivery of the project on time and within budget • Enables fast track delivery • Good for large, complex, schedule-driven projects • Owner and CM@Risk control contingency jointly	• Not suited for small projects • Owner/owner representative must actively participate in contingency management	• Limitation to 6 Caltrans projects takes this delivery mechanism out of play without a legislative fix. • Better suited for corridor-wide program of projects

Source: CSW Contractors, Inc.

8.3 Route Adoption

In accordance with State law, SR 239 has resided in Streets & Highway Code Section 539 as a designated part of the State Highway System for decades, with a simple description of the termini of such a facility:

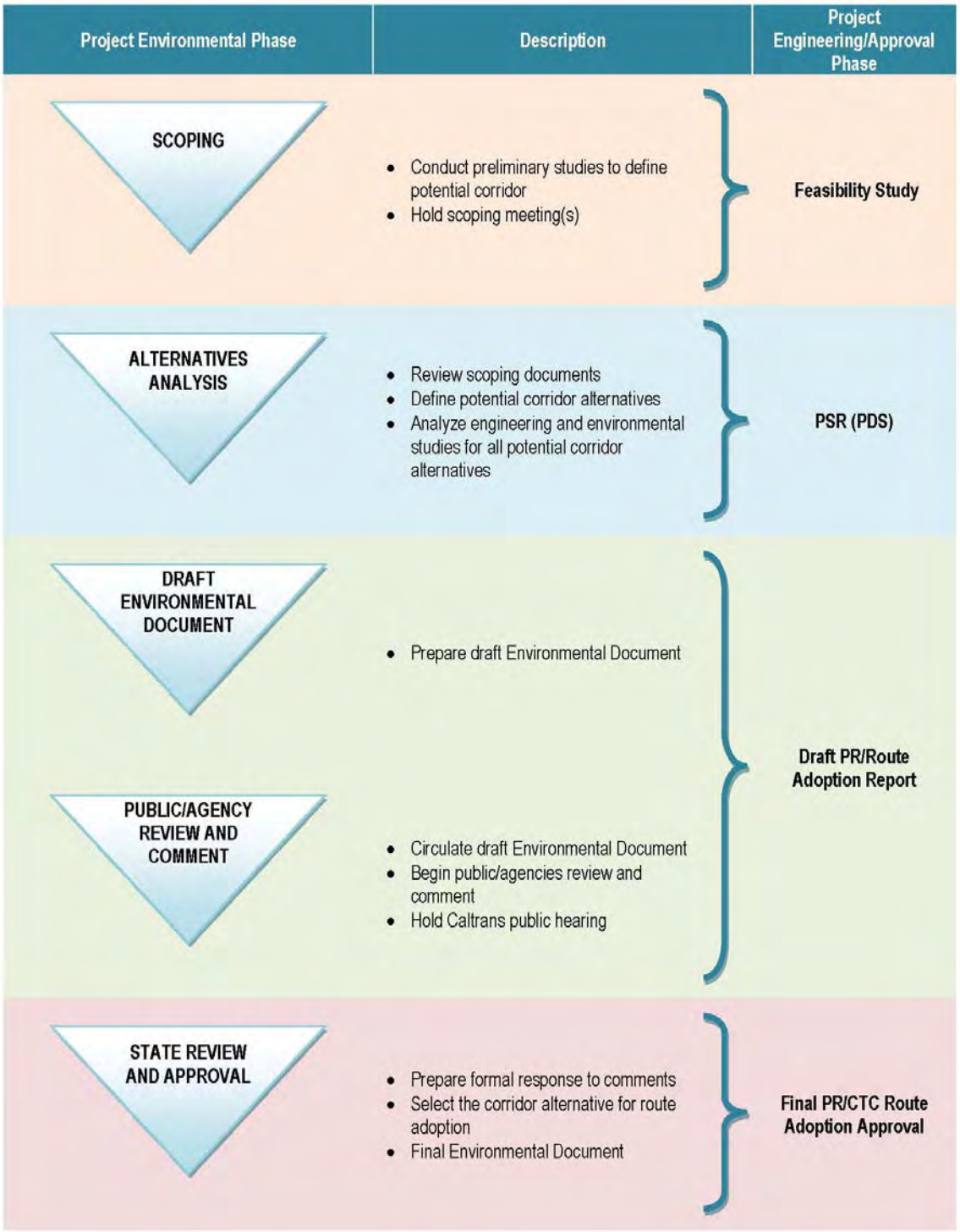
> *S&H Section 539. Route 239 is from Route 580 west of Tracy to Route 4 near Brentwood.*

By virtue of inclusion of the general route in State law, this factor provides the opportunity at some future point to seek formal inclusion of the route into the State system through the route adoption process set forth pursuant to S&H Code Section 75. This process authorizes the California Transportation Commission to select and determine the specific location of the roadway as a formal part of the State Highway System.

The procedure that the California Transportation Commission follows in adoption of a legislatively designated, but unconstructed route, such as would be the case for SR 239, as a more specific State Highway System component is with an alignment generally displayed on a certified map. Formal approval of a route alignment is accomplished through an adopted resolution, undertaken concurrent with the California Transportation Commission consideration of an environmental document under CEQA.

A separate consideration to be undertaken at the time of route adoption is related to whether the newly designated segment would be developed as a conventional highway or, more likely, with some measure of “access” control. If a feature of the future development of the route calls for a higher performing roadway that necessitates limited access by adjacent property owners, the route would be eligible to be designated as either a “freeway” or as a “limited access” facility. Such a determination would be made concurrent with the approval by the California Transportation Commission of the specific route adoption action. Figure 8.4-1 shows the correlation and timing between the project’s environmental and route adoption processes, as well as the required Caltrans project approvals.

Figure 8.4-1 SR 239 Route Adoption Environmental Process



Source: Caltrans District 6, Fresno SR 180 Route Adoption Public Hearing, March 2011.

8.4 Conclusion

As the key statewide revenue stream begins to wane (e.g., the last of Proposition 1B bond funding passes through the system into contracts and the closeout of American Recovery and Reinvestment Act [ARRA] funding draws near), all major actors involved in California's transportation community are now wrestling with how best to address the looming shortfall in transportation funds for State and local agencies. In view of this, CCTA can take the following steps to prepare to deliver and make progress on the implementation of the TriLink improvements:

1. Stay the course on project development activities. We have learned that project sponsors who can show that they are able to deliver a "shovel-ready" project when the State or federal government provides a new revenue supplement to transportation funding, whether one time, or through increased revenues generated, are those agencies usually in position to "claim" early funding dollars.
2. Look to secure additional local funding commitments. Participate in State and regional discussions relative to new funding initiatives that may emerge.
3. Be prepared to seek advantageous positioning in legislative or ballot-box efforts to increases in State funding for local entities.
4. Finally, to optimize delivery of the TriLink facility, in the context of the downward trending transportation funding environment, CCTA and the other local agencies must weigh the opportunities that current State laws may provide in the way of accelerated project delivery methods and innovative financing that can influence earlier capital outlay of the TriLink program of projects; this would then lead to an opportunity if extension of State laws are initiated, or, possibly, the development of a stand-alone legislative measure.

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Chapter 9
CONCLUSIONS

9.1 Funding and Delivery Strategy

Funding the program of projects identified by the TriLink study will be challenging. With an estimated capital cost of more than $750 million for all of the TriLink corridor improvements, available County, State, and federal funding amounts represent only a tiny fraction of the total necessary to deliver the program. Furthermore, in the context of the downward trending transportation funding environment, CCTA must weigh the opportunities that current State laws may provide. These opportunities may occur in the form of accelerated project delivery methods and/or innovative financing methods. Such methods may be appropriate candidates for tolling or other private financing mechanisms under P3s. Preliminary investigations indicate that TriLink could be an asset to the regional goods movement network and could be partially funded by potential toll revenues. The funding and delivery strategies, highlighted in Chapter 8, will be reviewed with agency stakeholders before a final strategy is selected. As discussed in Chapter 6, each corridor element has its own function and, aside from the I-580 Link, independent utility and, therefore, the ability to be constructed independently in phases. Fortunately, the option to phase construction relieves the need to identify funding for the entire program.

9.2 Findings and Next Steps

Four potential corridor elements and their optional alignments were evaluated to determine potential impacts. These elements include the Airport Connector, South Link, North Link (Options 1 and 2), I-580 Link (Options 1, 2a, and 2b), and a Transit Link (Options 1, 2, and 3).

The comparison results indicate that the two North Link options have similar impacts, with some differences in impacts to special-status wildlife species and ROW; however, the North Link Option 2 is approximately 50 percent more costly than the North Link Option 1. The I-580 Link Option 1 shows more impacts to corridor considerations than the I-580 Link Options 2a and 2b, and it is the most expensive. Corridor elements were not evaluated against each other, only

alignment options. This is because the corridor elements are not alternatives to each other, but they are a part of the program of improvements that are being recommended for further study. The potential impacts identified in this feasibility study will be evaluated in further detail with the next phases of program development before a preferred alignment option is selected.

Defining a precise alignment would include the following next steps:

- Prepare a Project Study Report-Project Development Support (PSR-PDS) to allow the option to use STIP funding for any or all of the phases (planning, design and engineering, ROW purchase and/or construction) needed to implement TriLink.
- Recommend a program of improvements in the PSR-PDS for the Route Adoption Study.
- Prepare a Route Adoption Report, which also requires preparing an environmental document.
- Obtain the California Transportation Commission Route Adoption Approval.

By taking these next steps, progress can be made toward implementation of the TriLink improvements.

It will be important for CCTA to stay the course on project development activities. By making progress, typically project sponsors who can show that they are ready to deliver when State or federal government provides a new revenue supplement to transportation funding can usually result in a more advantageous position to qualify for and receive early funding dollars. In addition, CCTA can look to secure additional local funding commitments or participate in State and regional discussions relative to new funding initiatives that may emerge. Looking forward, it would be beneficial for CCTA to get prepared to seek advantageous legislative positioning in ballot-box efforts to increase State funding for local entities or find innovative finance methods that can influence earlier capital outlay of the TriLink program of projects. The ability to design, build, operate, and maintain the TriLink program will require the continued cooperation and innovative thinking of the Study Team and the stakeholders to achieve the goals and realize the regional benefits.

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