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Planning for Tomorrow's Transportation

West County Action Plan

Proposal for Adoption | March 2023

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WCCTAC | West Contra Costa Transportation Advisory Committee

Member Jurisdictions:

El Cerrito | San Pablo | Pinole | Hercules | Contra Costa County | Richmond

West County Action Plan

Acknowledgements

This Action Plan is a culmination of work between many jurisdiction and agency representatives as listed herein. This list is not exhaustive of all partner agencies that assisted in formulating this plan in one form or another.[1]

West Contra Costa Transportation Advisory Committee (WCCTAC)

- John Nemeth, WCCTAC
- Leah Greenblat, WCCTAC
- Coire Reilly, WCCTAC
- Joanna Pallock, WCCTAC

WCCTAC Board Members

- Chris Kelley, City of Hercules
- Dion Bailey, City of Hercules
- Norma Martinez-Rubin, City of Pinole
- Devin Murphy, City of Pinole
- Tom Butt, City of Richmond
- Jael Myrick, City of Richmond
- Eduardo Martinez, City of Richmond
- Demnlus Johnson III, City of Richmond
- Rita Xavier, City of San Pablo
- Abel Pineda, City of San Pablo
- Paul Fadelli, City of El Cerrito
- Gabe Quinto, City of El Cerrito
- John Gioia, Contra Costa County
- Federal Glover, Contra Costa County
- Jovanka Beckles, AC Transit
- H.E. Christian Peeples, AC Transit
- Lateefah Simon, BART
- Mark Foley, BART
- Maureen Powers, WestCAT
- Aleida Andrino-Chavez, WestCAT

WCCTAC Member Agency Representatives

- Yvetteh Ortiz, City of El Cerrito
- Melanie Mintz, City of El Cerrito
- Lori Reese-Brown, City of Richmond
- Denee Evans, City of Richmond
- Allan Panganiban, City of San Pablo
- Sanjay Mishra, City of Pinole
- Misha Kaur, City of Pinole
- Mike Roberts, City of Hercules
- Robert Reber, City of Hercules
- Jamar Stamps, Contra Costa County
- John Cunningham, Contra Costa County
- Nathan Landau, AC Transit
- Celestine Do, BART
- Ricki Wells, BART
- Rob Thompson, WestCAT

[1] This Action Plan was funded by the Contra Costa Transportation Authority, who also provided technical assistance throughout the process. Technical consultants PlaceWorks, Fehr and Peers, and DKS Associates assisted CCTA, WCCTAC, member jurisdictions, and the WCCTAC Policy Board in plan preparation.

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Abbreviations

ADA	Americans with Disabilities Act
BART	Bay Area Rapid Transit
CBPP	Countywide Bicycle and Pedestrian Plan
CCTA	Contra Costa Transportation Authority
CEQA	California Environmental Quality Act
CMP	Congestion Management Plan
CO_2	carbon dioxide
CTC	County Transportation Commission
CTP	Countywide Transportation Plan
DPMT	dynamic personal micro transit
EB	eastbound
EBRPD	East Bay Regional Parks District
EIR	Environmental Impact Report
EPC	Equity Priority Communities
EV	electric vehicle
GHG	greenhouse gas
GMP	Growth Management Program
GPA	General Plan amendment
HOV	high-occupancy vehicle
HOT	high-occupancy toll
I-	interstate
ICM	Integrated Corridor Management
KSI	Killed or Severely Injured
LOS	Level of Service
LSBN	Low-Stress Bicycle Network
MPH	miles per hour
MTC	Metropolitan Transportation Commission
MTSO	Multimodal Transportation Service Objective
NNPHVTs	Net New Peak Hour Vehicle Trips

NOC	Notice of Completion
NOP	Notice of Preparation
OBAG	One Bay Area Grant
PBT	Pedestrian-Bicycle-Transit
PCI	Pavement Condition Index
PDA	priority development area
RRS	Routes of Regional Significance
RTMP	Regional Transportation Mitigation Program
RTO	Regional Transportation Objective
RTPC	Regional Transportation Planning Advisory Committee
SB	Senate Bill
SOV	Single-Occupant Vehicle
SR-	State Route
STMP	Subregional Transportation Mitigation Program
TAC	Technical Advisory Committee
TDM	Transportation Demand Management
TEP	Transportation Expenditure Plan
TIMS	Transportation Injury Mapping System
TLC	Transportation for Livable Communities
TNC	Transportation Network Company
TRANSPAC	Transportation Partnership and Cooperation
TSM	Transportation Systems Management
ULL	Urban Limit Line
VMT	vehicle miles traveled
WB	westbound
WCCTAC	West Contra Costa Transportation Advisory Committee
ZEV	zero-emission vehicle

West County Action Plan

Chapter 1: Introduction

This document is the Action Plan covering the incorporated and unincorporated communities throughout the West County subregion of Contra Costa County, prepared in compliance with the voter-approved Measure J Growth Management Program (GMP) of the Contra Costa Transportation Authority (CCTA). This chapter provides background information about CCTA, Measure J, the GMP, and this Action Plan.

Measure J Transportation and Growth Management Program

In November 2004, Contra Costa voters approved the renewal of the original 1988 Measure C Transportation Improvement and GMP — a half-cent sales tax to fund transportation projects and programs—with a new ballot measure called Measure J. Measure J, which began expenditure implementation in April 2009, is anticipated to generate approximately $2 billion (in 2008 dollars) over a 25-year period through 2034.

Measure J continues Contra Costa's innovative GMP that was originally adopted with Measure C, which voters approved in 1988. The goals of the GMP are as follows:

- Ensure that new residential, business, and commercial growth pays for the facilities required to meet the demands resulting from that growth.
- Require cooperative transportation and land use planning among local jurisdictions.
- Support land use patterns in Contra Costa County that make more efficient use of the transportation system, consistent with the general plans of local jurisdictions.
- Support infill and redevelopment in existing urban and brownfield areas.

To receive its formulaic share of 18 percent local street maintenance and improvement funds and to become eligible for Transportation for Livable Communities (TLC) funds, a local jurisdiction must comply with the GMP, which requires the following activities:[2]

- **Adopt a Growth Management Element** as part of its general plan that outlines how the jurisdiction will comply with the other requirements in this list.
- **Adopt a local and regional Development Mitigation Program** that ensures new growth, remodel, and reuse projects pay for their share of the costs associated with that growth.
- **Participate in an ongoing, cooperative, multijurisdictional planning process** with other jurisdictions and agencies in Contra Costa to create a balanced, safe, and efficient transportation system and to manage the impacts of growth.
- **Address housing options** and demonstrate reasonable progress in providing housing options for people of all income levels in a report on the implementation of actions outlined in the adopted housing element.
- **Develop a five-year Capital Improvement Program** outlining the capital projects needed to meet the goals of the local jurisdiction's general plan.
- **Adopt a Transportation Systems Management (TSM) Ordinance or Resolution** conforming to CCTA's model TSM Ordinance or Resolution and promotes carpools, vanpools, and park-and-ride lots.
- **Adopt a voter-approved Urban Limit Line (ULL)** complying with the countywide, voter-approved ULL or the local jurisdiction's voter-approved ULL.

Among these elements, preparing an Action Plan at the subregional level is included under the requirement to "Participate in an Ongoing, Cooperative, Multijurisdictional Planning Process." The specific requirements of this element, as defined in Measure J, are as follows:

[2] The Contra Costa TLC Program funds transportation projects in communities to facilitate, support, and/or catalyze affordable housing, transit-oriented or mixed-use development, and encourage traffic-calming and the use of non-vehicular modes of transportation to minimize single-occupancy vehicle trips and make Contra Costa's communities more pedestrian-, bicycle-, and transit-friendly.

Each jurisdiction shall participate in an ongoing process with other jurisdictions and agencies, the Regional Transportation Planning Committees (RTPCs) and the Authority to create a balanced, safe, and efficient transportation system and to manage the impacts of growth. Jurisdictions shall work with the RTPCs to:

- Identify Routes of Regional Significance (RRS) and establish Regional Transportation Objectives (RTOs)[3] for those routes and actions associated with achieving those objectives.
- Apply the Authority's travel demand model and technical procedures to the analysis of General Plan Amendments (GPAs) and developments exceeding specified thresholds for their effect on the regional transportation system, including on Action Plan objectives.
- Create a development mitigation program.
- Assist with development of other plans, programs, and studies to address other transportation and growth management issues.

In consultation with the RTPCs, each jurisdiction shall use the travel demand model to evaluate changes to local General Plans and the impacts of major development projects for their effects on the local and regional transportation system and the ability to achieve the RTOs established in the Action Plans.

Jurisdictions shall also participate in the Authority's ongoing countywide transportation planning process. As part of this process, the Authority shall support countywide and subregional planning efforts, including the Action Plans for RRS, and shall maintain a travel demand model. Jurisdictions shall help maintain the Authority's travel demand modeling system by providing information on proposed improvements to the transportation system and planned and approved development within the jurisdiction.[4]

A separate Action Plan is prepared and adopted for each of the five subregions in Contra Costa. The West County subregion, which is the subject of this Action Plan, encompasses the incorporated jurisdictions of El Cerrito, Richmond, San Pablo, Pinole, and Hercules, as well as unincorporated portions of western Contra Costa County.

CCTA is responsible for leading the development of and accepting the adopted Action Plans created in each subregion for inclusion in the Countywide Transportation Plan (CTP), and for evaluating whether each jurisdiction fully complies with the GMP.

[3] As discussed later in this Action Plan, the previously named Multimodal Transportation Service Objectives (MTSOs) have been renamed as Regional Transportation Objectives (RTOs).

[4] Measure J: Contra Costa's Transportation Sales Tax Expenditure Plan, Contra Costa Transportation Authority, July 21, 2004, pp. 24–25.

Action Plan Purpose

The purpose of the Action Plan is for each local jurisdiction in Contra Costa to participate in the multijurisdictional, cooperative planning process envisioned in Measure J to address regional transportation issues that span jurisdictional boundaries. The basic framework for this process is established through the Regional Transportation Planning Committees (RTPCs), which are defined in Measure J. As described previously, WCCTAC is the Authority-designated RTPC for West County. The Action Plans are intended to establish overall goals, identify RRS, create a set of performance measures (now called Regional Transportation Objectives or RTOs), and establish a set of actions that will support achievement of the RTOs. Action Plans are required by Measure J to be prepared by the RTPC for each subregion of Contra Costa County (West; Central; East; Lamorinda; and the Tri-Valley, which includes a portion of Alameda County). CCTA is responsible for funding this effort and for coordinating and coalescing the individual Action Plans from each RTPC together to form the foundation of the CTP.

Action Plan Contents

The West County Action Plan contains the following components:

- **Introduction (Chapter 1),** which outlines the Measure J GMP and the purpose of this document.
- **Current Conditions, Trends, and Travel Patterns (Chapter 2),** which assesses long-range land use and population changes and their anticipated impact to the transportation system.
- **Vision, Goals, and Policies (Chapter 3)** describes the overall vision, goals, and policies of the Action Plan.
- **Routes of Regional Significance (Chapter 4)** maps and describes the multimodal corridors that make up the RRS in West County.
- **Transit (Chapter 5)** identifies the RTOs and Actions related to transit service.
- **Active Transportation (Chapter 6)** identifies the RTOs and Actions related to active transportation.
- **Roadways (Chapter 7)** identifies the RTOs and Actions related to roadways.
- **Safety (Chapter 8)** identifies the RTOs and Actions related to transportation safety.
- **Equity (Chapter 9)** identifies the RTOs and Actions related to transportation equity.
- **Climate Change (Chapter 10)** identifies the RTOs and Actions related to climate change and transportation.
- **Innovation and Technology (Chapter 11)** identifies the RTOs and Actions related to innovation and new technology.
- **Financial Outlook (Chapter 12)** includes funding and multijurisdictional planning information.
- **Procedures for Notification, Review, and Monitoring (Chapter 13)** includes project notification procedures and the process for general plan review.

Chapters 5 to 11 include the RTOs for each mode or topic, and a list of actions that are needed to achieve the RTO targets and to implement other goals and policies of this plan. A consolidated list of actions for all chapter topics in this Action Plan can be found in Appendix C.

Relationship of this Action Plan to the Countywide Transportation Plan

This update of the West County Action Plan has been prepared concurrently with, and in conjunction with, updates to the other four subregional Action Plans. This Action Plan update uses a comprehensive approach that ensures the critical components of each Action Plan are similar to one another, with variations, as needed, to address the unique traits of West County and the other subregions. All five Action Plans determine the policies and actions that the Authority can adopt into the 2023 CTP Update. The Authority will incorporate the policies and actions from all five Action Plans provided that consensus has been achieved among the affected jurisdictions and RTPCs.

Public Engagement for the Action Plan

Extensive public outreach was conducted with the Contra Costa County community as part of the Action Plan update process. Both in-person and online outreach occurred during March and April 2022. Outreach events in West County included two in-person pop-up events, one virtual workshop, and an online community survey. At each outreach event and the online community survey, participants were asked three questions:

- What do you think transportation should look like in the future?
- What can we do to help you with your transportation needs?
- What is your bright idea for improving transportation in the county?

Of the 704 comments received during this public outreach effort, 12 percent of the responses were specific to the West County subregion, and the remainder were either general to the county as a whole or applicable to one of the other four subregions. Feedback regarding the West County subregion focused on providing safe and adequate roadways, transit improvements, active transportation improvements, and the general safety of all modes. Comments expressed a desire for:

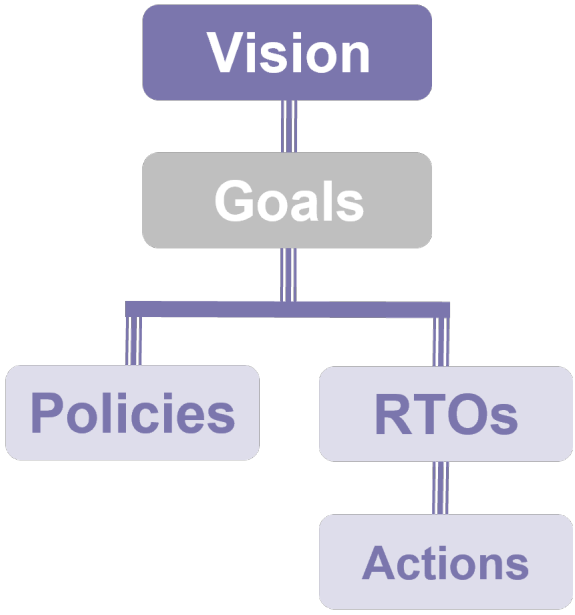
- Expansion of well-maintained, continuous, protected, safe, calm bicycle networks that cross cities, especially connecting to waterfront destinations and regional routes, with safe and easy freeway crossings.

- Implementation of traffic-calming measures.
- Improvements to transit access for those with mobility needs.
- Creation of dedicated bus lanes on arterial routes between Alameda County and Contra Costa County.
- Improvements to timed/coordinated service between Bay Area Rapid Transit (BART), Amtrak, and various bus agencies to serve long-distance and regional travel.
- Enhanced safety, comfort, and efficiency of transit service.
- Increased frequency of BART.
- Improvements to streetlight issues throughout Richmond, replace traffic lights, and fix potholes and paving issue areas.
- Infrastructure improvements to specific roadways, including San Pablo Avenue, Cutting Boulevard, Central Avenue, Canal Boulevard, and 15th Street.

Input received from this outreach effort provided CCTA, its consultants, and West County jurisdictions additional feedback to understand community priorities for consideration in the Action Plan update and the update of the CTP.

Definition of Terms

This Action Plan uses several terms to describe specific components of the Action Plan. These terms and their definitions are as follows.



- **Goal:** A statement that describes, in general terms, a condition or quality of service desired.
- **Policy:** A statement that guides action and overall direction. Decisions regarding investments, program development, and development approvals are based on these policies.
- **Route of Regional Significance (RRS):** RRS are roadways, publicly accessible transit facilities, and active transportation facilities that connect two or more subareas of Contra Costa; cross county boundaries; carry significant through traffic; and/or provide access to a regional center, a regional highway, or a transit facility. They are also routes for which entities in the subregion want to share regional responsibility with neighboring jurisdictions. RRS provide vital connections that support economic and recreational activities throughout the county.
- **Regional Transportation Objective (RTO):** RTOs are specific, quantifiable objectives that describe a desired level of performance for a component of the transportation system. They were referred to as Multimodal Transportation Service Objectives (MTSOs) in Measure J; however, for this Action Plan update, they have been branded to reflect the broader, more comprehensive approach to incorporating not only all travel modes and the facilities required to serve them, but also safety, equity, climate change, and innovation and technology. RTOs consist of a quantifiable measure of effectiveness (a “metric” or “standard”) and include a target date for attaining the objective. More information on RTOs is at the end of this chapter.
- **Metric:** The unit by which an RTO is measured, such as “level of service,” “delay index,” or “vehicle miles traveled per capita.”
- **Standard:** The level or increment of a metric that is required by an RTO. For example, the standard for level of service might be D, and the standard for vehicle miles traveled (VMT) per capita might be “20 miles per person per day.”
- **Action:** Actions are the specific programs or projects that are recommended for implementation to meet the RTOs in the Action Plan. The responsibility of implementing the Actions may fall to an individual local jurisdiction, to the RTPC as a whole, to CCTA, or to another agency, such as Caltrans or BART. Actions are either “projects” or “programs” (defined herein).
- **Project:** Projects are actions that involve the development, structural modification, or redevelopment of infrastructure, commercial uses, industrial uses, residential uses, or other properties. Projects may include clearing or land grading, improvements to existing structures, construction activities, and other activities requiring physical construction.

- **Program:** Programs are actions that do not involve construction but instead involve education, research, funding, or other non-construction activities. Similar to projects, programs are carried out in response to an adopted policy to help achieve a specific goal or objective.

Regional Transportation Objectives

Historically, Action Plans have included MTSOs to express the quantifiable objectives that the RTPCs would use to track progress. Although the MTSOs were by nature multimodal, they neither captured nor addressed new transportation imperatives that have recently come to the forefront. These imperatives include safety, equity, climate change, innovation, and technology. This Action Plan Update carries forward the previously adopted MTSO and rebrands them as Regional Transportation Objectives (RTOs). The transition to RTOs casts a wider net to capture the new transportation imperatives of the twenty-first century.

The CCTA's *Implementation Guide* defines the areas of consideration that should be addressed in Action Plans, but also gives the RTPCs significant flexibility in choosing RTOs for their Action Plan. As long as the objective is quantifiable and includes a time frame for achievement of the objective, it can be proposed for inclusion in the Action Plan. Selection of the RTOs was based in part on whether the objective could be easily measured through observation and/or forecast through use of the Countywide Travel Demand Model.

There are a total of 26 RTOs identified in this Action Plan. These RTOs are summarized in tables and described in detailed in Chapters 5 through 11. Refer to Appendix A for a summary of all RTOs and their targets. Refer to Appendix B to see objectives that were considered but not recommended for RTOs.

- **Transit RTO-1: Transit Mode Share.** Increase the mode share of transit trips in the subregion.
- **Transit RTO-2: Mode Share to BART.** Increase the number of riders who access BART using means other than automobiles, including transit and active transportation.
- **Transit RTO-3: Transit Trip Time.** Optimize peak-hour and peak-direction travel time for transit as compared to automobile travel time for the same trip.
- **Transit RTO-4: High-Quality Transit Access.** Increase the proportion of urbanized land area in the subregion served by high-quality transit.
- **Transit RTO-5: Paratransit and Community-Based Transportation Programs Access.** Increase the number of rides by paratransit and community-based transportation programs.
- **Active Transportation RTO-1: Increase Active Transportation Mode Share.** Increase the mode share of bicycling and walking in the subregion.
- **Active Transportation RTO-2: Low-Stress Bicycle Network.** Increase the proportion of the countywide low-stress bicycle network completed in the subregion.
- **Active Transportation RTO-3: Unprotected Trail Crossings.** Eliminate the number of locations where the low-stress bicycle network has an unprotected crossing of a heavily traveled vehicle route.

- **Roadways RTO-1: Freeway Delay Index.** Maintain peak-hour delay index on select freeway segments.
- **Roadways RTO-2: Freeway Buffer Index.** Maintain peak-hour freeway segment buffer index on select freeway segments.
- **Roadways RTO-3: Intersection Level of Service (LOS).** Maintain peak-hour LOS at RTO monitoring locations in urban areas.
- **Roadways RTO-4: Roadway Segment LOS.** Maintain peak-hour segment LOS on selected two-lane roadways outside of urban areas.
- **Safety RTO-1: Killed or Severely Injured Collisions.** Eliminate KSI collisions in the subregion.
- **Safety RTO-2: Active Transportation Collisions.** Eliminate collisions in the subregion that involve users of active transportation.
- **Safety RTO-3: Active Transportation Collisions Near Schools.** Eliminate active transportation collisions within 500 feet of a school.
- **Equity RTO-1: Equity Priority Community (EPC) Low-Stress Bicycle Network Completion.** Ensure that the proportion of the countywide LSBN that has been completed in EPCs is equal to or greater than the proportion completed in the subregion as a whole.
- **Equity RTO-2: Collisions in EPCs.** Ensure that the proportion of KSI and active transportation-involved collisions in EPCs is equal to or less than the proportion of the subregion's population living outside EPCs.
- **Equity RTO-3: EPC Job Access: Driving.** Ensure that the number of jobs that can be reached by EPC residents with a 30-minute drive is equal to or greater than the number of jobs that can be reached with a 30-minute drive by all residents in the subregion.
- **Equity RTO-4: EPC Job Access: Transit.** Ensure that the number of jobs that can be reached by EPC residents with a 45-minute transit trip is equal to or greater than the number of jobs that can be reached with a 45-minute transit trip by all residents in the subregion.
- **Equity RTO-5: EPC Access to High-Quality Transit.** Ensure that the proportion of urbanized EPC land area in the subregion served by high-quality transit is equal to or greater than the urbanized land area served by high-quality transit in the subregion as a whole.
- **Climate Change RTO-1: Single-Occupant Vehicle (SOV) Mode Share.** Reduce the mode share of SOVs in the subregion.
- **Climate Change RTO-2: Carpool Mode Share.** Increase the mode share of carpooling in the subregion.
- **Climate Change RTO-3: Vehicle Miles Traveled.** Reduce VMT per capita in the subregion.
- **Climate Change RTO-4: Greenhouse Gas Emissions.** Reduce transportation greenhouse gas (GHG) emissions per capita in the subregion.
- **Climate Change RTO-5: Zero-Emission Vehicles.** Increase the share of zero-emission vehicles (ZEVs) in the subregion.
- **Technology and Innovation RTO-1: Signal Interconnect Project.** Complete the project to upgrade traffic signals to regional ethernet and/or fiber-optic interconnection.

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Chapter 2: Current Conditions, Trends, and Travel Patterns

This chapter documents existing transportation conditions in West County. These conditions are the basis for formulation of this Action Plan and include description of baseline and projected transportation conditions for West County and the entire county. This information helps CCTA and the subregion to understand patterns in the transportation system and to make informed decisions on how to improve the system over time.

Travel Demand Modeling

Forecasts of future population and employment growth in West County, as well as projections of future travel demand on major West County transportation facilities, are drawn from the most recent available regional Travel Demand Model maintained by the Authority. This four-step, trip-based model was most recently revalidated to a 2019 base year. The version of the CCTA model applied for this analysis

accommodates a 2050 horizon year and incorporates enhanced traffic assignment procedures for freeway express lanes.

For the Action Plan update, land use inputs for the horizon year of 2050 were based on the Metropolitan Transportation Commission's (MTC's) Plan Bay Area's 2050 projections for Contra Costa County and Alameda County's portion for the Tri-Valley area. The transportation network assumptions for the Baseline 2050 scenario are derived from the latest CCTA Transportation Expenditure Plan (TEP) No Build scenario, to reflect only already-programmed improvements. In addition to the TEP projects, some additional express lanes are assumed on Interstate (I-) 680, and the extension of the BART service to Livermore was removed.

COVID-19 Effects

The Action Plan update process began in the summer of 2021, amid the COVID-19 pandemic. Although COVID-19 cases peaked nearly two years ago, from November 2020 to February 2021, COVID-19 impacts have been consistently present since March 2020. Specifically, shelter-in-place orders implemented by the Contra Costa County Health Officer and the State of California in March 2020 changed travel behavior significantly throughout the county and beyond. Commuters who were able to work remotely began to do so, recreational trips diminished, and our roadways were empty. As the pandemic slowed and mandates shifted, travel demand returned, but it is different than it was prior to the pandemic. These shifts in travel demand are important to acknowledge in the Action Plan update due to the uncertainties that the pandemic has produced.

Blue Ribbon Transit Recovery Task Force

The Blue Ribbon Transit Recovery Task Force is a 32-member group created to assist MTC to further understand the scale of the COVID-19 crisis and how it impacts the transit systems in the Bay Area. The task force helped develop Bay Area Transit Transformation Action Plan to reshape the region's transit system into a more connected, efficient, and user-focused mobility network across the entire Bay Area.

In September 2020, CCTA studied various effects on travel behavior resulting from COVID-19.[5] This study was intended to develop near-term mitigation measures to address post-COVID-19 impacts on anticipated traffic congestion in Contra Costa County. The study looked at data from March 2020 through June 2020 and showed that vehicle traffic volumes recovered after an initial decline and that transit ridership declined and remains low. CCTA also analyzed vehicle occupancy, unemployment, remote work rates, and BART data to predict traffic changes in the county. CCTA's analysis concluded that with an expected increase in the employment rate and a decrease in remote work, traffic volumes along Contra Costa corridors during peak conditions are expected to be higher than prior to COVID-19. The region should continue to track traffic trends to figure out what types of investments could address future changes.

The 2020 CCTA COVID report found that about 35 percent of employees in Contra Costa County were working remotely at the peak of the pandemic's shelter-in-place orders. That portion is expected to decrease to 25 percent (with no mitigation) to maintain work-from-home, or 30 percent with mitigation.

[5] CCTA, Impacts of COVID-19 on the Contra Costa Transportation System, September 2020.

As the effects of post-COVID-19 travel behavior evolve, it is unclear whether remote work will remain as prevalent, in part dependent on whether employers update current work-from-home policies.

Despite an initial decrease in vehicle traffic in 2020, Contra Costa County traffic volumes exceeded pre-pandemic levels by four percent as of July 2021. However, not all of the re-emerged traffic is for work purposes, as people have spread out the times during which they drive, including midday and weekends. In addition, the total number of vehicle collisions dropped in Contra Costa County, but fatalities have increased. The trend in increased fatalities is occurring throughout the United States and is not a phenomenon specific to Contra Costa.

CCTA's COVID-19 report shows that transit ridership experienced a serious decline, with BART, County Connection, and Tri-Delta losing high proportions of riders in the county. BART reduced service and hours from March 2020 until early 2022, including a 9:00 pm closing time for the first seven months of 2021. By February 2022, BART restored service hours to pre-COVID levels. According to BART's Monthly Ridership Report,[6] as of July 2022, although ridership is recovering, average weekday ridership is only 32 percent of pre-COVID levels. Some bus service in the Bay Area, especially AC Transit, showed a faster recovery than rail. The CCTA report concludes that even if the increase of people working from home is higher than pre-COVID conditions, overall congestion is likely to increase if transit ridership continues to be less than the pre-COVID levels.

One outcome of the pandemic is higher demand for bicycle and pedestrian facilities, public spaces for outdoor activities, and car-free streets. Regional residents have a newfound appreciation for the outdoors with an increase in visits to public parks. Cities across the country, including those in the Bay Area, have embraced car-free, or slow, streets. Berkeley, for example, closed north Telegraph Avenue to cars indefinitely in June 2022. In addition, businesses expanded parklets and patios to limit exposure to COVID-19 and have consequently changed how many public rights-of-way now operate.

Due to the impact of COVID-19 on the transportation system, the Action Plan update process relies on pre-pandemic data for all traffic modeling in the CCTA Travel Demand Model. CCTA uses 2019 as the Action Plan base year, and used 2020, 2040, and 2050 population and employment data to interpolate and forecast for future years. A base year of 2019 was used because the impacts of the COVID-19 pandemic could skew analysis results due to constant fluctuations in travel behavior. While the direct impacts of the COVID-19 pandemic are not reflected in the Action Plan, CCTA hopes that the next

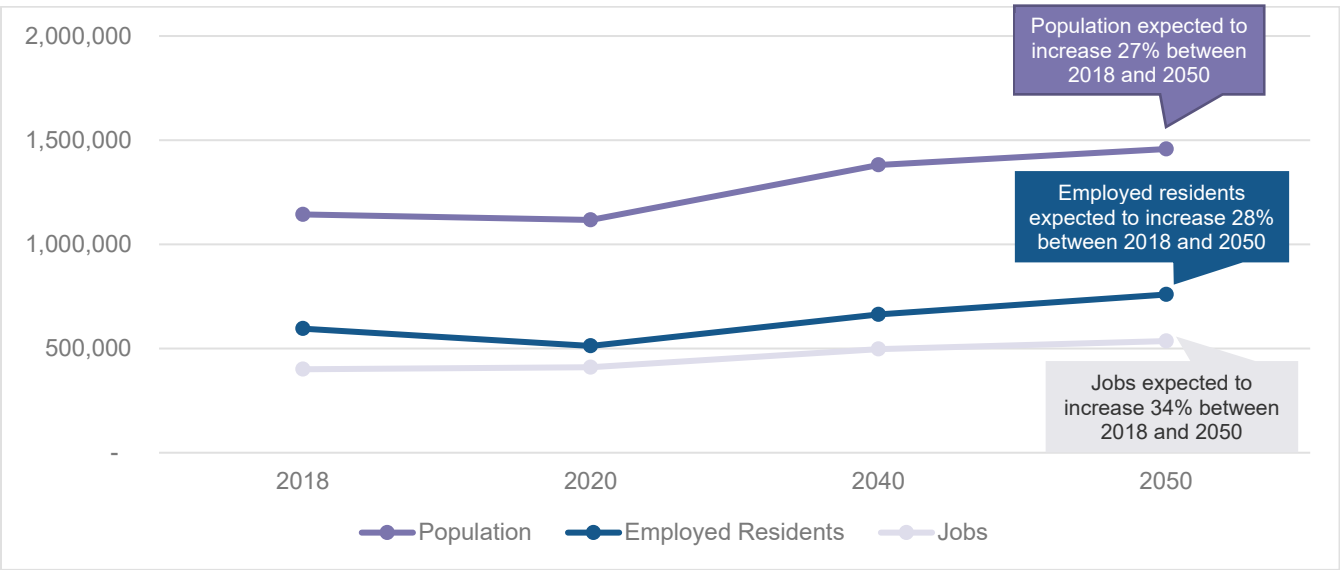
[6] BART, Monthly Ridership Report, July 2022, https://www.bart.gov/sites/default/files/docs/202207%20MRR.pdf.

update of the Action Plan is able to account for the “new normal” of travel behavior once a consistent behavior emerges in the coming years.

Population and Employment

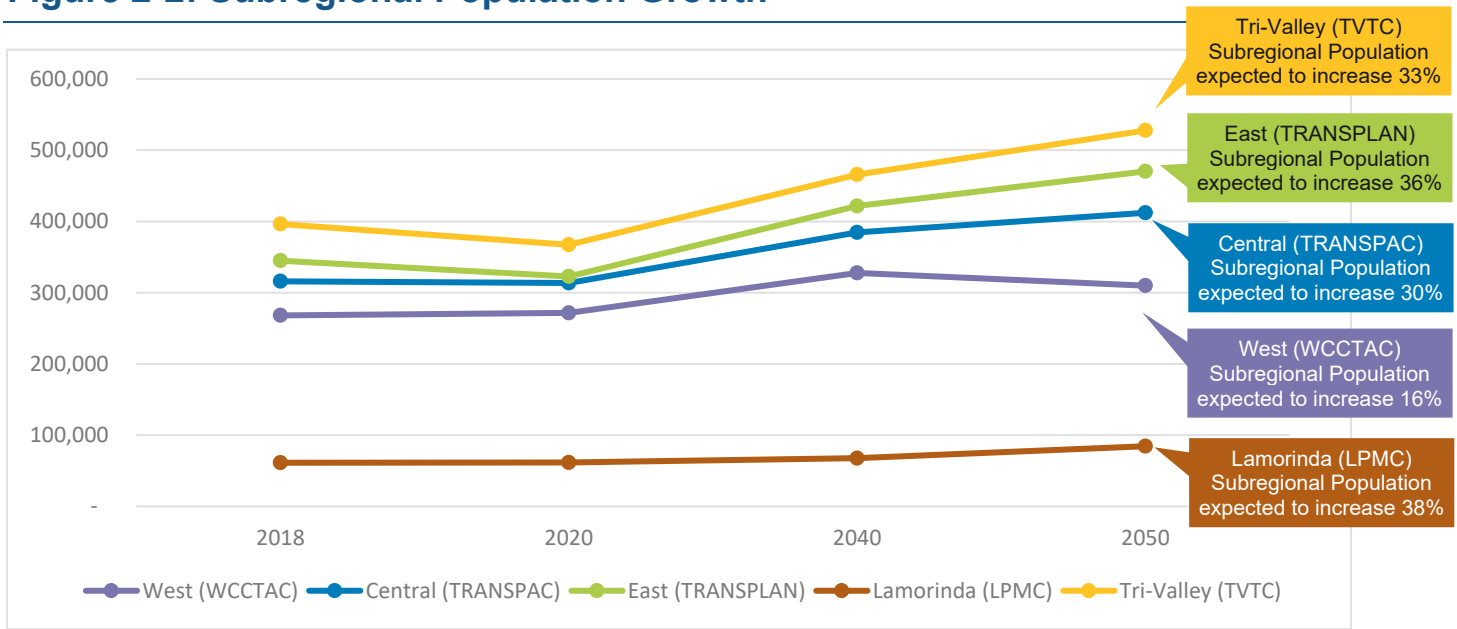
Countywide forecasts for population, employed residents, and jobs are shown in Figure 2-1, which shows a downward trend of population and employed residents between 2018 and 2020 due to the COVID-19 pandemic. Projecting beyond 2020, all three categories are expected to follow fairly similar growth patterns.

Figure 2-1: Contra Costa County Demographic Growth



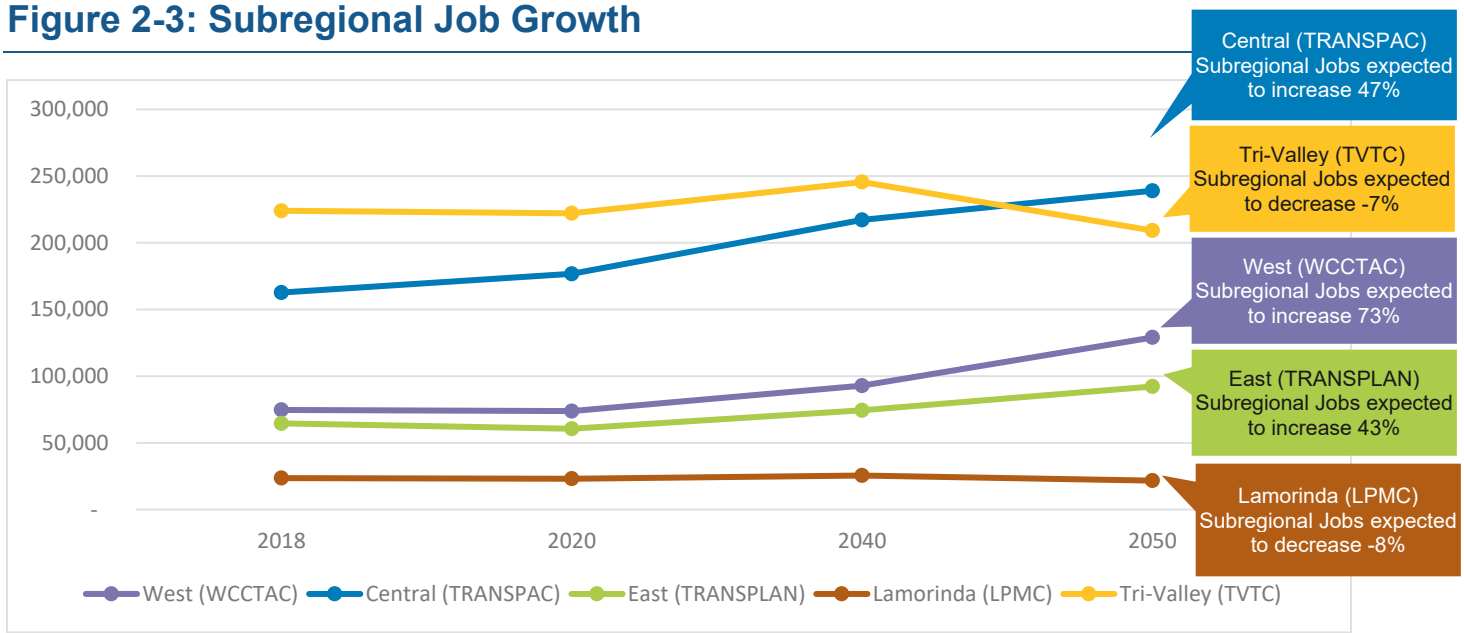
The five subregional forecasts for population growth between 2018 and 2050 are shown in Figure 2-2. The West County population, represented by the purple line, is projected to grow at a fairly modest rate (16 percent between 2018 and 2040); by 2050, West County is anticipated to be home to about 309,913 people, a lower population than Central County, East County, and Tri-Valley, but a much larger population than the Lamorinda area.

Figure 2-2: Subregional Population Growth[7]



Subregional forecasts for employment growth between 2018 and 2050 are shown in Figure 2-3. Again, West County is represented by the purple line. In West County, jobs are expected to grow faster than population. West County is projected to experience significant employment growth of 73 percent between 2018 and 2050, more than any other subregion.

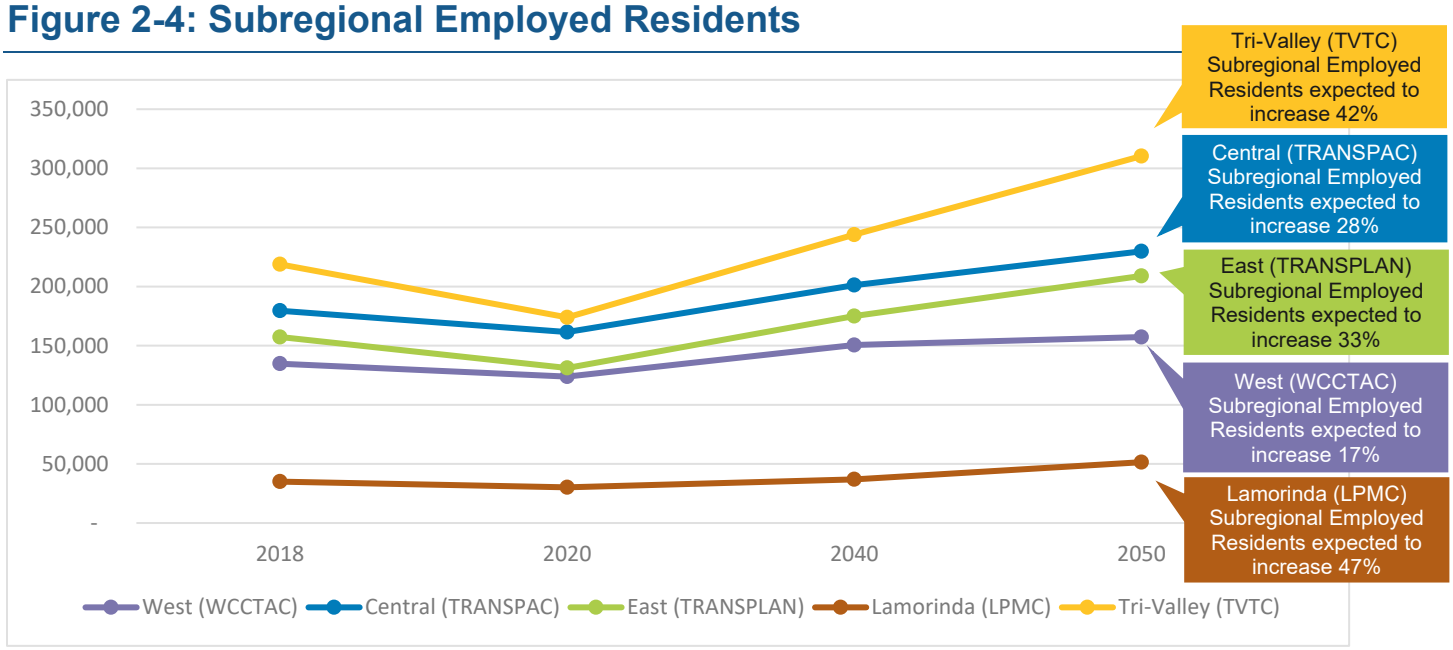
Figure 2-3: Subregional Job Growth



[7] The projected decline in West County population between 2040 and 2050 is a result of a disconnect between Plan Bay Area 2050 projections and the population projections previously assumed for 2040 in the CCTA Travel Demand Model.

Subregional forecasts for employed residents are shown in Figure 2-4. Again, West County is represented by the purple line. Countywide, the percentage of employed residents is expected to grow more similar to population than to jobs, with West County projected to experience 17 percent growth of employed residents between 2018 and 2050, the lowest of any other subregion.

Figure 2-4: Subregional Employed Residents



Commute Patterns and Travel Demand Forecasts[8]

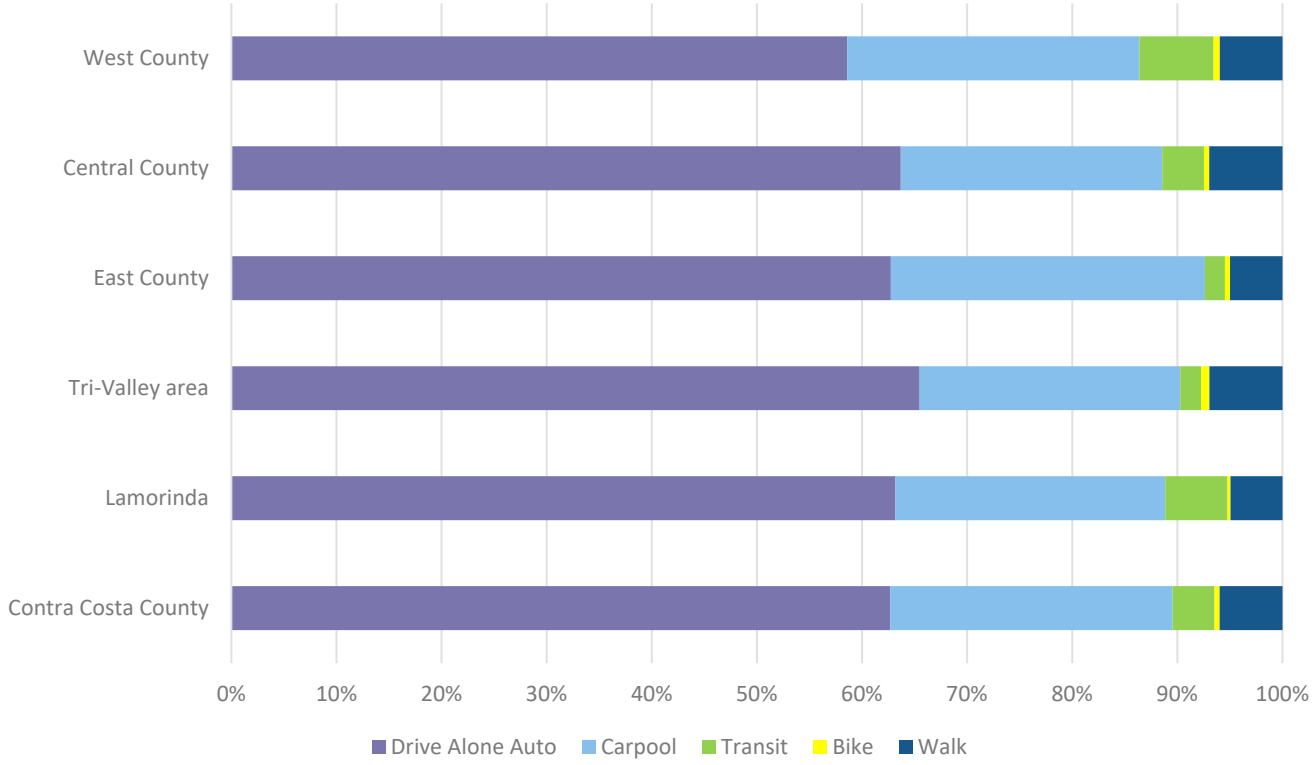
The regional Travel Demand Model was applied to generate estimates of the future traffic volumes expected on major roadways throughout the county. As with all subregions in the county, traffic volumes throughout West County are anticipated to increase each year as the local population continues to grow.

Countywide Mode Share

Each of the five CCTA subregions is geographically and socioeconomically unique. Some subregions have more dense, urban development that is quite conducive to transit and active transportation, and others are suburban or have hilly geographies that make transit and active transportation less viable. For instance, West County jurisdictions are more urban than other subregions like East County. Therefore, the mode share for each mode of transportation varies between subregions, as illustrated in Figure 2-5.

[8] It should be noted that the model results shown in this chapter are intended to give an idea of the order-of-magnitude changes in traffic volumes anticipated across the region; much more detailed and refined studies would be undertaken for any specific project.

Figure 2-5: Mode Share of All Transit Trips by Subregion (2019)



Modeled Mode Share

Understanding mode share and how to shift it is key to changing the transit system and the active transportation system, and to curbing the transportation system's impact on climate change. The modeled and forecast mode shares are derived from CCTA's trip-based travel demand model. It is important to note that this model does not account for shifts in travel patterns that emerged in response to the COVID-19 pandemic and that may carry forward into the future. Therefore, the forecast results do not reflect increased rates of remote work that have occurred for some jobs.[9] Also note that the mode shares for active transportation only reflect trips that are made primarily by bicycling or walking. Walking or bicycling to reach transit stops is not counted as a separate active transportation trip but only as a transit trip.

[9] Some jobs, such as service jobs or healthcare, can only occur in person. However, many online-based jobs that are typically considered to be "white collar" jobs are able to be conducted remotely. As mentioned in the COVID-19 Effects section, only some of the online-based jobs that experienced a shift to remote work during the pandemic will remain that way. A future update of the West County Action Plan can better understand the rate of post-pandemic remote work and the impact it has on mode share.

Reported Current Commute Mode Share

The American Community Survey estimates, published by the United States Census Bureau, report the number of work trips by mode. An estimated mode share based on this data is shown in Table 2-1, which shows the commute mode share for Contra Costa County and the West County subregion. As shown in Table 2-1, in 2019, about 79 percent of the work trips in Contra Costa County are made by automobile, either driving alone or by carpool, compared with 78 percent in the West County subregion, which shows a higher share by carpooling.

Table 2-1: Means of Transportation to Work in the Planning Area and West County Subregion (2019)

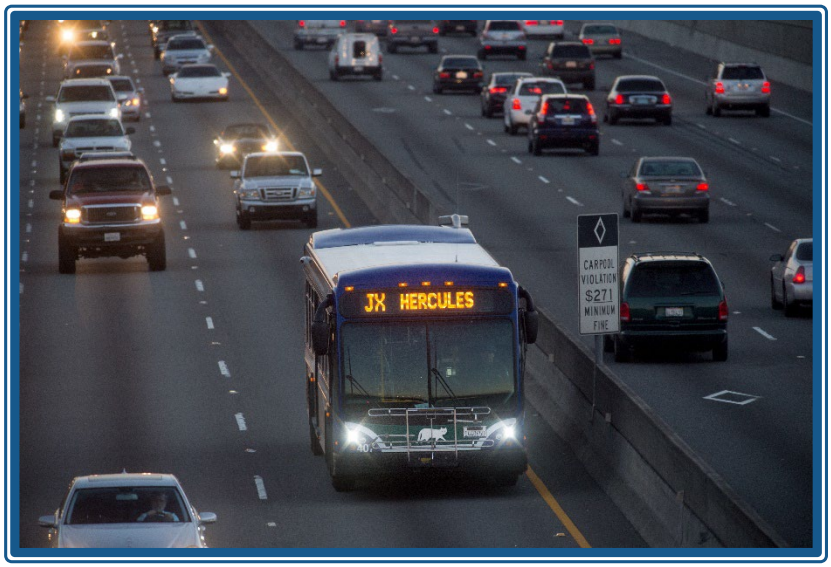
Mode	Contra Costa County			West County Subregion		
	Estimate	Margin of Error	Percentage Mode Share	Estimate	Margin of Error	Percentage Mode Share
Total:	**544,376**	**±3,447**		**133,436**	**±3,074**	
Car, truck, or van - drove alone	367,467	±3,409	68%	85,367	± 2,435	64%
Car, truck, or van - carpooled	62,385	±2,486	11%	18,606	±1,123	14%
Public transportation (excluding taxicab)	59,068	±1,981	11%	17,726	± 1,011	13%
Taxicab, motorcycle, bicycle, walked, or other means	19,344	±2,462	4%	4,556	± 641	3%
Worked from home	36,112	±1,310	7%	7,179	±607	5%

Source: American Community Survey 5-Year Estimates, Table B08301.

Note: The American Community Survey found that five percent of West County workers were found to work from home in 2019. While the number of workers working from home rose dramatically during the COVID-19 pandemic, there are no reliable data on the exact percentage. The "work from home" mode is accounted for in the Countywide Travel Demand Model during the trip generation step by omitting those trips. In this forecast, "work from home" is assumed to continue at current levels. As COVID-19 recedes and workers begin to return to commuting, new data will become available and will be incorporated in the next model update to reflect higher percentages of "work from home" based on the new survey data.

Modeled Commute Mode Share

Mode shares for home-to-work trip purpose have been calculated based on the residence location (Table 2-2) or the work location (Table 2-3). These tables report mode shares for both West County and Contra Costa County as a whole. The modeling results show that most work trips by West County residents are made by automobile, specifically those driving alone. West County's transit mode share for work trips is higher than the county's, reflecting the availability of BART service. Active transportation trips account for a very small portion of commute trips made by West County residents. (Note that the bicycle mode share only reflects trips made by bicycle from beginning to end and does not count access trips to and from transit stops.)



The mode shares for West County commuters are projected to remain similar to existing shares, with modest decreases in the drive-alone auto and transit mode shares and increases in carpool, bicycle, and walk shares. These shifts reflect the currently planned levels of transit service (e.g., BART to San Jose by 2040) and the projected population and employment distribution of 2050.

Commuters to jobs in West County predominantly use the automobile modes to get to work, especially driving alone. Transit and active transportation account for very small shares of this market. Commute mode shares are predicted to remain much the same by 2050, with a moderate increase in the transit mode share.

Table 2-2: Modeled Home-to-Work Mode Share: West County Residents

	Contra Costa County		West County Subregion	
	2019	2050	2019	2050
Drive-Alone Auto	72%	70%	63%	62%
Carpool	14%	15%	14%	16%
Transit	12%	13%	21%	20%
Bicycle	0.3%	0.5%	0.3%	0.7%
Walk	1.4%	2%	1.4%	2%

Source: CCTA travel demand model and DKS Associates.

Note: Mode shares calculated with home-based work person trip ends at the production (home location) zone. Totals may not add due to rounding.

Table 2-3: Modeled Home-to-Work Mode Share: Jobs in West County

	Contra Costa County		West County Subregion	
	2019	2050	2019	2050
Drive-Alone Auto	83%	79%	78%	72%
Carpool	12%	13%	14%	16%
Transit	3%	4%	5%	8%
Bicycle	0.4%	0.7%	0.4%	0.9%
Walk	2%	3%	3%	3%

Source: CCTA travel demand model and DKS Associates.

Note: Mode shares calculated with home-based work person trip ends at the attraction (work location) zone. Totals may not add due to rounding.

Mode Share for All Trip Purposes

Table 2-4 reports the mode share calculated for all trip purposes in the CCTA travel demand model—from home to work, shopping, social/recreation, grade school, high school, and college, as well as trips not starting from home. The modeling results show that most trips are currently made by automobile, with transit and active transportation modes accounting for less than 14 percent of all trips.

By 2050, the mode shares are expected to remain similar to 2019 conditions, with a slight increase in drive-alone share for West County, decrease in transit share, and a slight increase in active transportation mode share in both the Planning Area and the West County subarea.

Table 2-4: Mode Share for all Trips: West County Subregion Residents[10]

	Contra Costa County		West County Subregion	
	2019	2050	2019	2050
Drive-Alone Auto	63%	63%	59%	62%
Carpool	27%	28%	28%	26%
Transit	4%	3%	7.1%	5%
Bicycle	0.5%	1%	0.6%	0.5%
Walk	6%	6%	6%	7%

Source: CCTA travel demand model and DKS Associates.

Note: Totals may not sum due to rounding.

[10] Note that projections in Table 2-4 are anticipating mode share shifts based on the CCTA Travel Demand Model and already planned for and/or funded projects. Therefore, some modes, such as carpooling, transit, and bicycle, are projected to decrease through 2050. This projection does not take into account the improvements adopted in this Action Plan; therefore, the 2050 share of these modes is anticipated by West County jurisdictions to be higher than reported in Table 2-4.

Transit

West County is heavily connected via public transportation, especially along the western edge of urbanized land in the subregion. Forms of public transportation include passenger rail and BART rail, one existing and one proposed ferry station, and several dozen bus routes. Several bus services transport residents and workers into and out of the subregion and the county. WestCAT service links riders to Central County and San Francisco, and AC Transit runs between Alameda, Contra Costa, and San Francisco Counties. Several other providers, including Golden Gate Transit, Fairfield and Suisun Transit, SolTrans, and Vine Transit, link West County to neighboring counties, including Alameda, Solano, and Marin. See Chapter 5, Transit, Figure 5-1, for a map depicting these routes and facilities.

Supporting Transit with a New Transit Center

The City of Hercules is in the process of developing the Regional Intermodal Transit Center in a convenient waterfront location along Bayfront Boulevard near Refugio Creek. The development would add 1,300 residential units as well as commercial, office, and live-work spaces. When complete, the station will be the only place on the West Coast with a single connection point to bus, transit, rail, and ferry, and it will be one of the largest transit-oriented developments in California.

The 2017 West County Action Plan and the CTP resulted in several positive transit system programs and developments. These include, but are not limited to, the continuation of the student bus pass program, completion of the Richmond Ferry project and future operations, and additional funding for various bus facilities.

As discussed previously, the COVID-19 pandemic caused a decrease in use of public transportation that is still reverberating throughout Contra Costa County. In 2019, West County transit trips accounted for just over seven percent of all trips in the subregion, the highest of any Contra Costa County subregion. The long-term behavior change that the COVID-19 pandemic may cause in terms of transit ridership is unknown. However, it is the goal of this Action Plan to increase transit ridership to meet, then exceed, pre-pandemic levels. See Chapter 5, Transit, for more information on objectives and actions to achieve this goal.

Active Transportation Facilities

The existing West County active transportation network includes low-stress facilities; Class I, Class IIIB, or IV; either along the bay shoreline or adjacent to several major thoroughfares. These facilities, in conjunction with a network of non-low-stress facilities, Class II and III, offer opportunities for both recreational and commute bicycle and pedestrian traffic to traverse the subregion.[11] See Chapter 6, Active Transportation, Figure 6-1, for a map depicting these routes and facilities.

Active Transportation

Active transportation is the movement of people or goods through nonmotorized means, usually through human activity like walking, pedaling, or rolling. It is essential for the reduction of carbon emissions, improving public health through physical activity, reducing risks for chronic diseases, better air quality, improved community mental health, and increasing ADA-accessible spaces. Forms of active transportation can include shared and privately owned micromobility devices, standard or electric bicycles, wheelchairs, and more.

The existing 2017 West County Action Plan and the CTP resulted in several successful bicycle and pedestrian projects, including, but not limited to, the Ferry to Bridge project linking the Richmond-San Rafael Bridge with the newly opened Richmond Ferry Station, and improvements and completion of several gaps in the network, including the Yellow Brick Road, the Richmond Wellness Trail, the Point Molate Bay Trail, the Riverside Avenue Pedestrian Crossing, and the Marina Bay Parkway Undercrossing (Bradley Moody Memorial).

Despite the installation of these facilities, bicycle and pedestrian travel modes remain low, accounting for just under seven percent of all West County trips in 2019. See Chapter 6, Active Transportation, for more information on objectives and actions to achieve bicycle and pedestrian goals.

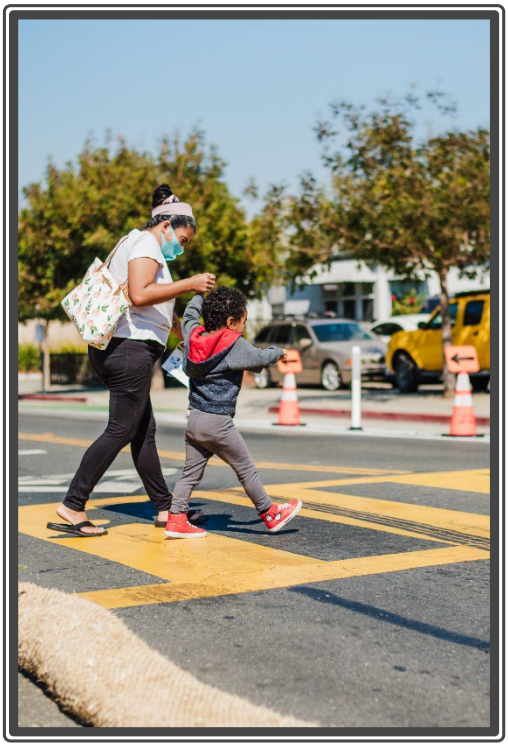
Roadways

The West County roadway network is the most comprehensive travel network in the county and provides facilities for both automobile and non-automobile travel. Major facilities include I-80 and I-580, which link West County to Solano and Marin Counties, State Route (SR-) 4, which links West County to Central and East County subregions, SR-123 (known locally as San Pablo Avenue), and various roads that serve local and regional traffic. See Chapter 7, Roadways, Figure 7-1, for a map depicting these routes and facilities.

[11] Class I facilities are bicycle paths or shared-use paths with exclusive right-of-way for bicyclists and pedestrians, split from automobile traffic. Class II facilities are bicycle lanes on the perimeter of streets, defined by pavement striping and signage to delineate a portion of the roadway for bicycle travel. Class III facilities are routes that are shared by both automobiles and bicycles, often represented through painting or signage on the roadway. Class IIIB facilities are the same as Class III except there are additional protections for bicycles such as bollards to reduce the amount of automobile traffic or designation of streets as one-way for automobiles. Class IV bicycle facilities are similar to Class II facilities except there is a physical barrier that separates the automobile and bicycle traffic for enhanced safety.

Although there have been various capacity improvements to local roadways in the past decades, traffic congestion continually gets worse as population and development increase. Additionally, as described in the beginning of Chapter 2, the impacts of the COVID-19 pandemic on the transportation network, mainly roadways, is ongoing and the future of congestion on these roadways is uncertain. It is estimated that approximately 86.5 percent of trips in West County are made by vehicle, either driving alone or as a carpool. This percentage translates to 23.5 VMT per capita in the subregion. The roadway and vehicle goals in this Action Plan aim to decrease both the mode share of SOVs and VMT, while increasing the carpooling mode share. See Chapter 7, Roadways, for more information on objectives and actions to achieve these roadway and vehicle goals.

Safety



Safety is a foundational consideration of the transportation system because it affects the lives, health, and well-being of all West County residents for all modes of transportation. Major collision, severe injury, and death can happen if a Safe System Approach for infrastructure design is not implemented. Collisions that result in death or severe injury may increase proportionally as population increases, particularly without a Safe System Approach, major improvements to infrastructure, and programming focused on improving safety for all, with a focus on vulnerable users, including seniors and people walking or bicycling. However, this Action Plan includes goals, RTOs, and actions that aim to reduce and eventually eliminate collisions resulting in death or severe injury, per the Authority's adopted core principles of Vision Zero.[12] Vision Zero is a strategy that aims to eliminate all fatalities and severe injuries that result from traffic collisions. The Vision Zero approach views transportation-related fatalities as preventable, not inevitable, and relies on multidisciplinary collaboration that is informed by data and is focused on equity. CCTA and their member jurisdictions and partners are committed to the Vision Zero approach and to a Safe System Approach that will enhance the existing transportation network and leverage future projects to ensure a safe environment for all.

If accompanied by a Safe System Approach to public right-of-way design and construction, intelligent transportation technologies can improve safety through vehicle technology deployment. Examples of such technologies include connected/autonomous vehicles, smart traffic signals with bicyclist and pedestrian detection, and physical improvements such as roadway design, physically separated active transportation infrastructure, connectivity, broader educational outreach, training, and ongoing professional development. The importance of our community's safety of people traveling will increase as mobility increases, most often along shorter trips. Safety is a top priority of the Action Plan. See Chapter 8, Safety, for more information on objectives and actions to achieve these safety goals.

Equity

Residents in and from low-income communities and communities of color are disproportionately burdened by air pollution, traffic congestion, risks to individual and public health, and limited access to services such as healthy food, banking, health services, parks, schools, and other important locations that support opportunities for health and prosperity. These inequities are partially due to lack of access to essential goods and services, lack of proximity to transportation options, and inability to own a vehicle (let alone upgrade to an electric or hybrid vehicle). These inequities are important to consider within the transportation system to ensure that communities with disproportionately less access to the greater community are considered in long-term transportation planning processes.

This Action Plan focuses its equity goals, policies, RTOs, and Actions on "equity priority communities" (EPCs) designated by MTC. They are places in West County that are documented to have less advantageous socioeconomic characteristics than the Bay Area as a whole. This Action Plan includes several initiatives to address potential inequities in these communities. See Chapter 9, Equity, for more information on objectives and actions to achieve equity goals.

Climate Change and GHG Trends and Forecasts

Climate change is a significant challenge facing people and the planet, and transportation is the largest contributor of GHG emissions. The Intergovernmental Panel on Climate Change's (IPCC's) Sixth Assessment Report states that the increased consumption of fossil fuels (e.g., natural gas, coal, gasoline) has substantially increased atmospheric levels of the GHGs that change the climate. The transportation system and the public's health are vulnerable to the effects of climate change, most notably changing climate and weather patterns; duration and frequency of events such as drought, wildfires, storms, extreme heat events, flooding, and sea-level rise; and more needs to be done to make the transportation system resilient to these changes. In addition to impacts on the transportation system, changes in climate adversely impact agricultural productivity, water quality, air quality, and other living conditions, resulting in a variety of mental, physical, dietary, and socioeconomic effects. Air pollution from mobile sources, especially heavy-duty vehicles and diesel-powered vehicles, increases the risk and occurrence of asthma, allergies, cardiovascular diseases, lung diseases, and other preventable health impacts. Therefore, one of the Action Plan's goals is to plan for a more sustainable and resilient transportation system that reduces its carbon footprint as well as mitigates climate risk from climate hazards and other impacts. This Action Plan addresses climate change in Chapter 10, which outlines RTOs and actions that will reduce GHGs through decisions that will support cleaner transportation options.

[12] CCTA codified Vision Zero work through Resolution 21-40-G, which adopts the Contra Costa Countywide Transportation Safety Policy and Implementation Guide for Local Agencies.

Innovation and Technology

CCTA and WCCTAC are committed to ongoing innovation and the deployment of new technologies to improve the transportation system. Innovative initiatives and technology added to current projects and programs could reduce traffic congestion, improve air quality, and provide new, cleaner mobility options for all West County residents. Such innovations include, but are not limited to, in-vehicle technology such as sensors, automated capabilities, and safety enhancements, as well as outside-of-vehicle technology, such as smart signals that employ artificial intelligence in real-time to help officials monitor and manage traffic flow and communicate to meet specific goals. Other technologies include “dynamic personal micro transit” (DPMT), which includes automated vehicles that could address first/last-mile connectivity issues, or “mobility as a service,” which gives riders dynamic and real-time information on available travel options at that time. See Chapter 11, Innovation and Technology, for more information on objectives and actions to achieve these goals.

Housing Development

The State of California is increasingly creating regulations that require local jurisdictions, such as those in the West County area, to accommodate additional housing, whether such housing is locally supported or not. Simultaneously, the State has removed allowances to look at traffic congestion resulting from development as a significant impact under the California Environmental Quality Act (CEQA). Together, these changes mean that local communities may increasingly approve housing projects without finding significant traffic impacts from such projects under CEQA.

This Action Plan accounts for these changes by including measures of roadway congestion in the RTOs, and by committing that WCCTAC and CCTA will work to make roadway capacity improvements to maintain desired LOS where possible. Nonetheless, local jurisdictions may see LOS decline as residential projects are approved, and they should not anticipate that residential projects may be denied simply due to their traffic impacts.

Conclusion: Moving Toward a Multimodal Network

As is the case in all of Contra Costa and the nation, West County’s existing transportation network was constructed primarily with a focus on the efficient movement of vehicles. However, innovation and technology; prioritization of the movement of people (most efficiently transported via transit); considerations regarding the climate, safety, and equity; and an increased interest in non-vehicular modes of transportation have made possible a shift to a more dynamic future.

This Action Plan, if thoughtfully implemented, will improve the overall quality, sustainability, equity, and safety of transportation. This Action Plan includes goals, policies, RTOs, and actions to improve the transportation system and to ensure that all people can more equitably and safely travel through, to, and within West County.

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Chapter 3: Vision, Goals, and Policies

This chapter summarizes the vision, goals, and policies that lay the framework for this Action Plan.

Vision

The overall vision of the Action Plan is to ensure that the transportation system in West County serves the needs of the community while accommodating and encouraging a shift in travel behavior that reduces congestion and leads to a healthier and better-quality life for all. The goals and performance measures in this Action Plan were designed to accomplish this vision and to ensure West County jurisdictions are working holistically, tapping into various modes, and using new technology and innovation.

Long-range transportation planning in West County and greater Contra Costa County requires a holistic, multimodal planning approach based on cooperation among all jurisdictions, partner agencies, and the community. This approach must consider all components of the transportation system simultaneously, anticipate the needs and desires of the community, and show the path to the future. Multijurisdictional coordination and ongoing discussions are critical to ensure that the services offered,

projects pursued, and programs launched support and build off one another. Such a holistic approach can ensure that a unified plan is implemented to meet the needs of the community.

Goals

This Action Plan includes 16 goals for the transportation system in West County. Some goals pertain to one mode or topic in the Action Plan while others are multimodal and/or cover more than one topic.

1. Provide geographically comprehensive, reliable, efficient, and effective local and regional transit services.
2. Expand high-capacity transit in West County.
3. Increase use of active transportation modes.
4. Complete and expand the regional trail system.
5. Support active transportation modes through the creation and improvement of bicycle and pedestrian facilities.
6. Decrease SOV travel and VMT.
7. Actively support development in Priority Development Areas (PDAs) that includes strategies to implement transit-oriented development.
8. Improve the efficiency of highway and arterial operations through a holistic planning approach that considers shared mobility and prioritizes non-SOV transportation.
9. Maintain existing transportation facilities in adequate condition.
10. Ensure a safe and low-stress transportation system for all modes of travel.
11. Support and improve quality of life in communities impacted by rail transport, heavy truck activity, and other high noise and pollution-generating transportation sources.
12. Minimize transportation impacts on the climate.
13. Ensure the transportation system is resilient in the face of climate change.
14. Continue the process of innovation and the development and implementation of new technologies and programs in transportation.
15. Support equitable mobility for all income groups, racial and ethnic groups, and all ages and abilities across all modes of transportation.
16. Plan for emergency access and evacuation as part of the transportation system.

Policies

1. Engage in collaborative discussions with partner agencies, jurisdictions, boards, and committees to ensure that the perspectives and concerns of all relevant parties are addressed when making regional decisions that impact transportation facilities.
2. Work with MTC and other agencies to implement regional initiatives such as One Bay Area Grant (OBAG) and PDA development strategies.
3. Implement the Actions in this Action Plan, and other projects and programs as needed, to achieve and maintain the RTOs in this Action Plan.
4. Consider safety as a top priority when designing new or modified travel corridors to be consistent with Countywide Vision Zero.
5. Support growth in downtowns, PDAs, transit priority areas, and other areas well-served by transit, so as to lessen reliance on SOVs.
6. Promote transportation alternatives to reduce demand on existing facilities in lieu of widening roadways and further impacting the natural environment.
7. Support land use decisions that improve jobs-housing balance.
8. Coordinate with economic development agencies and nongovernmental organizations to attract new employment to housing-rich areas.
9. Improve transit and active transportation access to PDAs.
10. Recognize, support, and subsidize transit as an essential and free or very low-cost service for transit-dependent people.
11. Consider complete corridors, complete streets, and bicycle and pedestrian needs in all neighborhood and roadway planning and design efforts.
12. Continue to develop a seamless connection between bicycling and transit.
13. Ensure the active transportation network is attractive for all users by maintaining facilities in good working order, including pavement condition, vegetation along facilities, and debris removal.
14. Focus bicycle and pedestrian network efforts on closing gaps in the planned low-stress bicycle network, connecting key destinations such as downtowns, transit hubs, and major recreation areas.
15. Work to minimize congestion and maintain RTOs on the vehicular roadway network, while also prioritizing improvements and projects that support modes other than SOVs.
16. Support Transportation Demand Management (TDM) programs that reduce VMT, improve access to transit, and increase transit ridership.
17. Encourage local jurisdictions to develop objective design standards to support the development of transit-oriented communities.
18. Continue to expand coordination between Contra Costa and neighboring counties (including Alameda, Solano, and Marin) to reduce SOV travel along the I-80 corridor.

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Chapter 4: Routes of Regional Significance

One of the key elements of an Action Plan is the designation of RRS. The RTPCs have the authority to designate RRS in their regions.

RRS are facilities for which jurisdictions in the subregion want to share regional responsibility with neighboring jurisdictions. Designation of RRS helps CCTA, WCCTAC, local jurisdictions, and the general public know which facilities are important to the region and serve as the basis for monitoring and maintenance by CCTA and WCCTAC.

Competing Modes in the Action Plan

Although the State of California no longer uses level of service (LOS) as a metric to measure the impacts of developments on the transportation system, this Action Plan contains performance metrics to track traditional LOS on roadways. The Action Plan also measures vehicle miles traveled (VMT), the newly adopted metric for evaluating vehicles on the transportation system.

This Action Plan is written in a manner that supports and prioritizes non-automobile modes on certain RRS, including transit or active transportation. In some cases, local jurisdictions will need to determine which goals to implement at a given time on a given facility. Therefore, it may be the case that some goals in this Action Plan could compete with one another and it will be up to the local jurisdictions and their elected officials to prioritize their own goals without conflicting with the overarching goals of the Action Plan.

When deciding which routes to designate, the Measure J GMP guidelines recommend four conditions to consider:

1. Connect two or more subregions of Contra Costa County
2. Cross county boundaries
3. Carry significant through traffic
4. Provide access to a regional center, regional highway, or transit facility

A transportation facility that meets one or more of these conditions is not required to be designated as an RRS —designations are the purview of the RTPC.

Some routes that meet one or more of the criteria can remain undesignated, provided that a consensus not to designate such routes is reached among affected jurisdictions. Furthermore, routes that enter or leave the RTPC require joint discussions among the affected regional committees to determine if consensus can be reached regarding designation.

Historically, Action Plans have only been required to designate RRS for roadway and vehicle facilities, largely with the intent to monitor delay and congestion. Only a few non-roadway RRS were designated anywhere in the county. However, with the understanding that the future of transportation planning requires a holistic approach and consideration of shared mobility, this updated Action Plan includes designation of RRS and active transportation as well as vehicles.

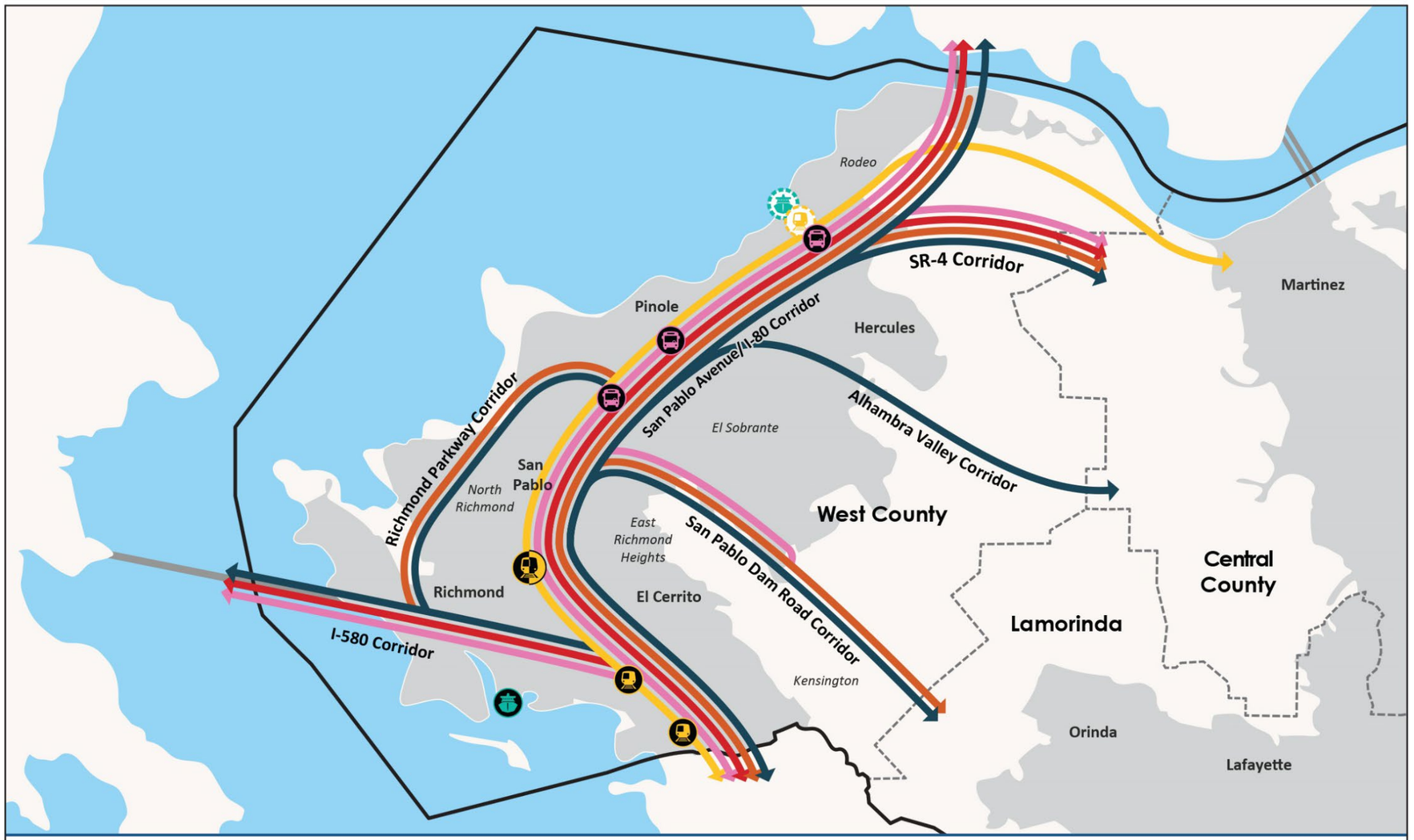
Multimodal Corridor Maps of RRS

To characterize the multimodal nature of RRS, CCTA has worked with WCCTAC and the other RTPCs to develop a series of multimodal corridor maps to show five different transportation modes on a single map (bus, rail, bicycle, freeway, and surface roadway). The maps are intended to illustrate the multimodal nature of the transportation network and that multiple facilities exist in any given transportation corridor. The maps are not intended to be exact, but to show travel corridors within the multimodal transportation network. The West County Multimodal Corridor Map is shown in Figure 4-1.

There are several critical notes to these corridor maps:

- The new multimodal corridor maps show desired future conditions, meaning some facilities and routes shown are planned but not yet constructed.
- The corridors shown on the maps are highly generalized to show multimodal conditions where they exist or may someday exist, and therefore include multiple facilities and routes within one corridor.

Figure 4-1: West County Multimodal Corridor Map



* These maps show desired future conditions, meaning some facilities and routes shown are not yet complete and may not have an adopted plan to complete them as of publication of this Action Plan.

** The corridors shown in this map are generalized to show multimodal conditions where they exist, and therefore include multiple facilities and routes within one corridor. To see mode-specific Routes of Regional Significance designated in this Action Plan, refer to Figures 5-1, 6-1, and 7-1.

*** This corridor map shows the facilities in this subregion only. See other maps for facilities in other subregions.

Source: PlaceWorks, 2023.

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Chapter 5: Transit

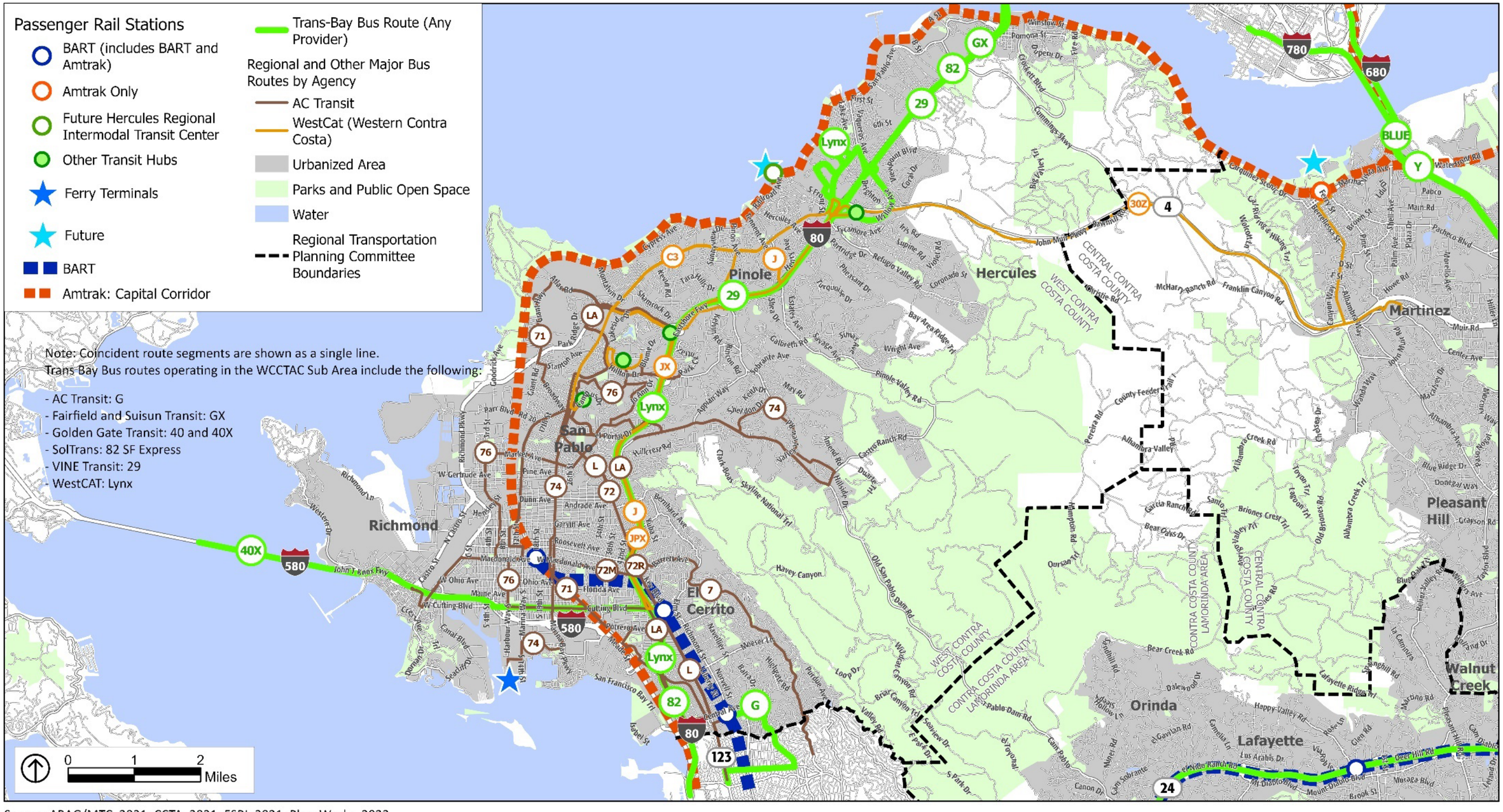
Transit in West County includes a variety of different providers, from multiple bus operators to Amtrak rail, BART rail, and ferry service. Transit service also includes vital accessible transportation services through ADA-mandated and non-ADA-mandated paratransit and community-based transportation programs for the elderly or residents with disabilities. Many of the routes and facilities vital to the West County transit system are shown in Figure 5-1. See Table 5-1 for a summary of transit RTOs.

Table 5-1: Summary of Transit Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Transit RTO-1: Transit Mode Share	Increase mode share of transit trips	None	21% commute trips 7% of all trips	25% of commute trips 10% of all trips
Transit RTO-2: Mode Share to/from BART	Increase mode share of people accessing BART with non-vehicle modes	None	46%	56%
Transit RTO-3: Transit Trip Time	Optimize travel time on transit for key corridors	None	Transit time ≤ auto travel time	Transit time ≤ auto travel time
Transit RTO-4: High-Quality Transit Access	Increase urbanized land area served by high-quality transit	None	28%	40%
Transit RTO-5: Paratransit and Community-Based Transportation Program Access	Increase rides through paratransit and Community-Based Transportation programs	None	Increase by 5%	Increase by 20%

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets.

Figure 5-1: Important Transit Routes in West County



Source: ABAG/MTC, 2021; CCTA, 2021; ESRI, 2021; PlaceWorks, 2022.

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RTOs

Transit RTO-1: Transit Mode Share

Increase the Mode Share of Transit Trips in the Subregion

This RTO tracks transit mode share and defines transit as fixed-route public transportation. It does not include general carpooling through Transportation Network Companies. As shown in Table 2-2, in 2019, 21 percent of West County residents commuted to work using transit, compared to 12 percent of residents in Contra Costa County as a whole. By 2050, these figures are projected to increase for countywide transit commutes to 13 percent, but to decline by one percent for West County residents. Meanwhile, Table 2-4 indicates that in 2019, 7.1 percent of all West County trips were taken by transit, higher than the countywide transit mode share of four percent for all trips.

The COVID-19 pandemic has greatly reduced transit trips, so this Action Plan includes a performance target for transit mode share in the West County subregion to return to pre-pandemic levels of 21 percent of commute trips by 2027 and exceeding that mode share by 2050 to reach 25 percent of commute trips by transit. Further, this Action Plan proposes a target transit mode share of seven percent of all trips by 2027 and 10 percent of all trips by 2050. While these goals are ambitious, they are needed to meet local, regional, and statewide goals to minimize VMT, transportation-related GHG emissions, and traffic congestion.

Transit RTO-2: Mode Share to/from BART

Increase the Number of Riders Who Access BART Using Means Other Than Automobiles, Including Transit and Active Transportation

This metric assesses the mode used by BART riders to access BART stations in West County.

BART and MTC conduct a ridership survey approximately once every 10 years that includes gathering information about modes used to access BART. The results of the most recent survey, conducted in 2015, are shown in Table 5-2.

The table shows that 46 percent of BART riders in West County used non-vehicle modes to access BART stations in 2015, compared to 53 percent systemwide.

The performance target for this RTO is to restore West County's non-vehicle BART access modes toward the pre-pandemic performance of 46 percent by 2027. For 2050, the goal is to increase the share by an additional 10 percent, to a total of 60 percent.

This RTO will only be assessed when BART and/or MTC conduct ridership surveys, so it may not be assessed as frequently as the other RTOs in this Action Plan.

Table 5-2: Mode Used to Access West County BART Stations (2015)

Station	Active Transportation	Transit	Total for Non-Vehicle Modes
El Cerrito Plaza	43%	4%	47%
El Cerrito del Norte	29%	13%	42%
Richmond	41%	8%	49%
Total West County	**37%**	**9%**	**46%**
Total BART System	**44%**	**9%**	**53%**

Source: MTC BART 2015 ridership survey

Note: The BART and MTC ridership study did not disaggregate access to BART stations via carpooling. Results in this table only show access to BART stations via active transportation (walking or bicycling) and via transit (bus, train, or other transit).

Transit RTO-3: Transit Trip Time

Optimize Travel Time for Transit as Compared to Automobile Travel Time for the Same Trip

This metric compares the peak period transit travel time on select corridors to the equivalent SOV travel time in the peak commute direction. The key corridor(s) monitored for the West County subregion along with the comparative travel times are shown in Table 5-3.

The performance target for this RTO is that transit travel time should be less than or equal to auto time, when measured from transit station to transit station. As shown in Table 5-3, travel by BART is not currently quicker than driving between the Pleasant Hill BART station and the Richmond BART station but is expected to be by 2050 in the morning westbound and afternoon eastbound directions. Between the Hercules Transit Center and Salesforce Transit Center in San Francisco, transit via the Lynx route compares favorably to driving in the morning westbound and afternoon eastbound directions. By 2050, these advantages will become more pronounced. In contrast, the bus trip from Contra Costa College to downtown Oakland takes about twice as long as driving. The transit to drive time ratio is expected to improve slightly for the southbound morning direction but worsen significantly for the afternoon northbound trip by 2050.

Table 5-3: Travel Time Ratio for Autos vs Transit on Key Corridors

Corridor	Median Drive Time (Minutes)[a]	Scheduled Transit Time (Minutes)[b]	2050 Drive Alone (Minutes)[c]	Ratio of Transit/Drive Alone Time	
				2019	2050
Richmond BART and MacArthur BART					
Morning – Southbound	19.45	19	23.86	0.98	0.80
Afternoon- Northbound	24.69	18	26.49	0.73	0.68
WestCAT Lynx Hercules Transit Center and Salesforce Transit Center in San Francisco					
Morning – Westbound	47.55	38	116.07	0.80	0.33
Afternoon- Eastbound	48.38	50	130.42	1.03	0.38
AC Transit Route 72R Contra Costa College and 14th Street/Broadway in Oakland					
Morning – Southbound	27.66	56	31.10	2.02	1.80
Afternoon – Northbound	33.19	68	17.05	2.05	3.99

a) Range of average driving time for Tuesdays – Thursdays for April 2019 from INRIX Roadway Analytics.

b) From published schedules. Note that this RTO assumes that 2050 scheduled transit trip times will remain constant. While increased population and congestion mean that transit trip times may not stay constant throughout the coming decades, there is no appropriate model by which to predict the change that may occur in transit trip times. Further, it is possible that transit operators could potentially maintain existing scheduled timing by taking advantage of future improvements such as bus on shoulder or express lanes, among others.

c) CCTA travel demand model congested time skims for a.m. and p.m. peak periods.

Note: Refer to Roadways RTO-2 for more information related to the trip time of the Richmond BART to MacArthur BART segment compared to driving the same segment.

Transit RTO-4: High-Quality Transit Access

Increase the Proportion of Urbanized Land Area in the Subregion Served by High-Quality Transit

This RTO seeks to increase the proportion of urbanized land[13] area in the subregion served by high-quality transit, which is defined as urbanized land area within a quarter mile of bus stops served by bus routes with headways of 15 minutes or less, or within a half mile of rail or ferry terminals. This RTO compares access to high-quality transit both pre- and post-pandemic and sets targets accordingly. Figure 5-2 illustrates that the majority of pre-pandemic high-quality transit bus lines operating in West

[13] "Urbanized Land" in this Action Plan is based off an ESRI-created Geographic Information System (GIS) layer called "Urban Clusters Data," which identifies urbanized areas based on the United States Census population data. An urban area comprises densely settled cores of census tracts and/or blocks that meet minimum population density requirements, along with adjacent territory containing nonresidential urban land uses with low population density included to link outlying densely populated areas.

County are no longer operating at a frequency of 15 minutes or less. The only routes currently operating at 15 minutes or less frequency are the AC Transit 72R, 72M, and 72 routes shown in pink on Figure 5-2. Table 5-4 compares the West County acreage of urbanized land that is within a quarter mile buffer of a high-frequency bus stop and within a half-mile distance of a BART or ferry station. Pre-pandemic, this acreage made up 28 percent of West County's urbanized land, with a decrease to 13 percent post-pandemic.

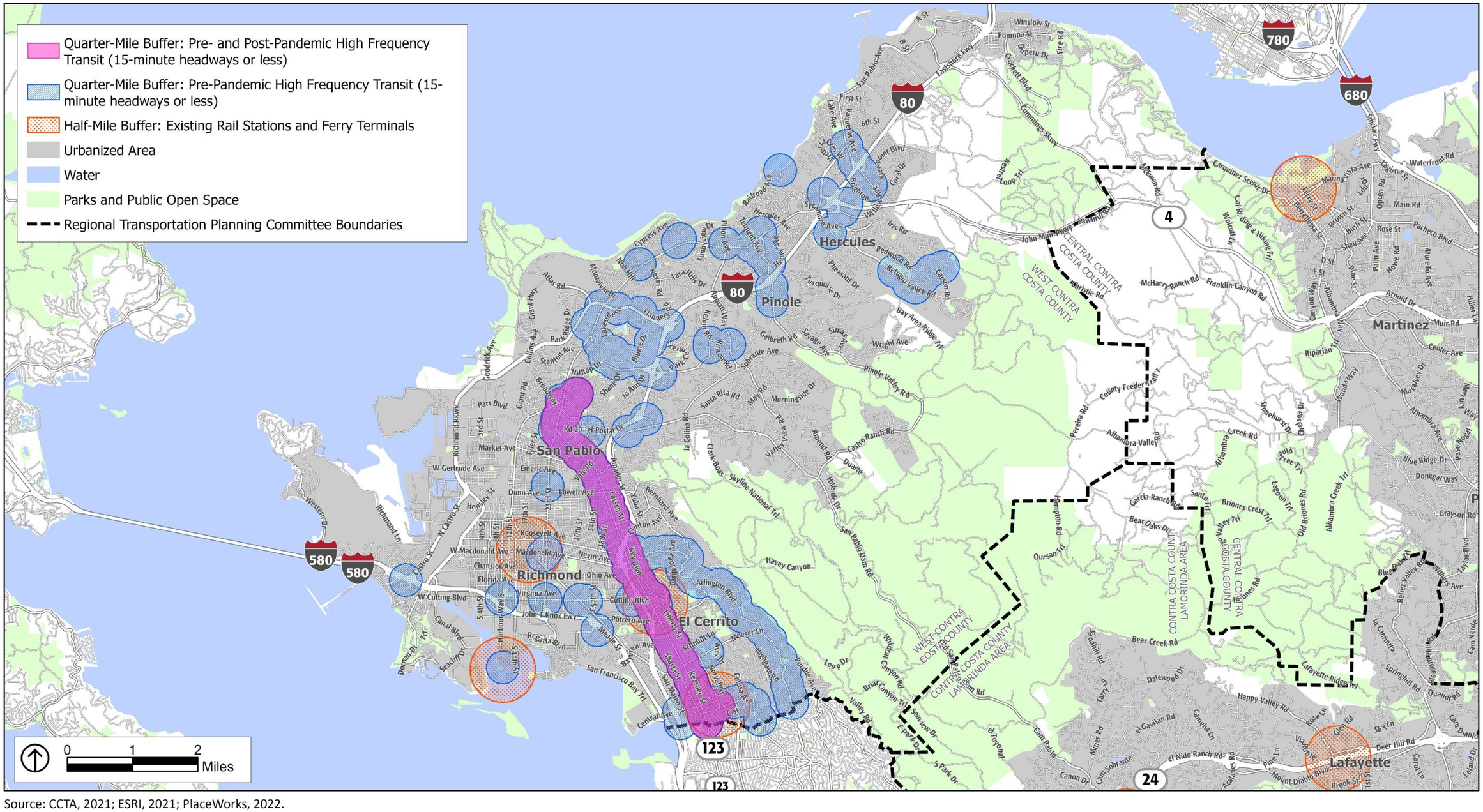
This Action Plan sets a target that the high-quality transit bus lines that operated prior to the pandemic be reinstated by 2027, to result in 28 percent of urbanized land in West County being served by high-quality transit. Since some urbanized areas are too remote or have densities that are too low to support transit, it would not be realistic to set a goal that 100 percent of urbanized areas be served by high-quality transit. However, there is room for improvement over current conditions. Therefore, this Action Plan proposes that the subregion should aim to have 40 percent of urbanized acres served by high-quality transit by 2050.

Table 5-4: Proportion of Urbanized Land in West County with Access to High-Quality Transit

	Pre-Pandemic Acres	Pre-Pandemic Proportion of Total Acres	Post-Pandemic Acres	Post-Pandemic Proportion of Total Acres
Urbanized area in subregion with access to high-quality transit	9,221	28%	3,140	13%
Total urbanized area in subregion	32,954		32,954	

Note: "Access to high-quality transit" is defined as within a quarter mile of bus stops served by bus routes with headways of 15 minutes or less, or within a half-mile of rail or ferry terminals.

Figure 5-2: West County High-Quality Transit



Source: CCTA, 2021; ESRI, 2021; PlaceWorks, 2022.

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Transit RTO-5: Paratransit and Community-Based Transportation Programs Access[14]

Increase the Number of Rides by Paratransit and Community-Based Transportation Programs

This metric tracks annual rides from the seven paratransit and other accessible transportation programs that conduct operations in a portion, or the entirety, of the West County subregion. These programs serve a variety of customers, from those with disabilities to the elderly. These accessible transportation operators and the number of rides provided in calendar year 2019 are listed in Table 5-5.

This Action Plan sets the goal that the number of rides provided among these seven West County providers should increase by five percent by 2027 to 819,798 rides, and by 20 percent by 2050 to 936,912 rides.

Table 5-5: Number of Calendar Year 2019 Rides Provided by West County Paratransit and Community-Based Transportation Programs

Provider	2019 Rides
East Bay Paratransit [a,b]	708,097
WestCAT Dial-A-Ride [a]	3,194
Easy Ride Paratransit Service	2,355
R-Transit	4,530
San Pablo Senior and Disabled Transportation	4,270
Vistability [b]	54,940
Mobility Matters [b]	3,374
Total Rides	**780,760**

a) These programs are ADA-mandated programs.

b) These providers operate in areas throughout the East Bay and therefore the number of rides includes all rides, not only those in the West County subregion.

[14] CCTA, WCCTAC, and West County jurisdictions recognize that tracking paratransit rides is not a true measure of success when looking at countywide accessible transportation. For instance, several nonprofits encourage those using on-demand paratransit services try fixed-route transit services to meet certain needs. Use of fixed-route transit is not accounted for in this RTO. CCTA, WCCTAC, and West County jurisdictions recognize that there may be more opportunities to track accessible transportation programs in a meaningful way in the next Action Plan update. This is particularly true with ongoing work that CCTA is doing as a result of their Accessible Transportation Strategic Plan adopted in 2021.

Actions

The following actions are needed to achieve the RTO targets and to implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and the unincorporated portion of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Transit-1: Work with local transit providers and regional funding agencies to identify funding for improvements for mobility (e.g., via bus) service in West County, including operations and maintenance and supporting infrastructure, such as bus yards.
- Transit-2: Pursue plans, programs, and projects that incorporate pedestrian and bicycling access into transit-oriented development.
- Transit-3: Work with CCTA to develop new or expanded mobility hubs along major activity centers and along freeways and other important corridors and work with partners to address issues related to ownership, acquisition, and oversight of operations and maintenance.
- Transit-4: Work with the Water Emergency Transportation Authority (WETA), CCTA, and other partners to ensure ongoing operations of Richmond Ferry Service.
- Transit-5: Work with passenger rail operators in countywide and regional efforts to implement passenger rail improvements in West County, such as providing higher frequency of service on the Capitol Corridor and San Joaquin Altamont Corridor Express (ACE) Corridor, and planning for the Link 21 program.
- Transit-6: Pursue projects and programs that improve the passenger experience, such as upgrade systems, modernize stations, and expand the passenger capacity of BART stations.
- Transit-7: Improve the reliability, efficiency, frequency, and travel time of transit (e.g., bus) service along RRS, especially on San Pablo Avenue.
- Transit-8: Continue to work with CCTA and local jurisdictions to improve circulation and multimodal access near BART stations.
- Transit-9: Implement the recommendations of the Contra Costa Accessible Transportation Strategic Plan, including the establishment of a new coordinating entity and a new, ongoing, and dedicated funding source.
- Transit-10: Implement plans and support ongoing plans that promote regional express buses and enhance bus rapid transit along transit corridors and RRS.
- Transit-11: Continue to consider the prospects for a public transportation link between the Richmond Station to Contra Costa College in San Pablo and Hilltop in Richmond, with an awareness of the evaluation criteria in BART's system expansion policy.

- Transit-12: Plan and implement enhanced railroad crossings to improve the safety of pedestrian and bicycle access and to reduce noise and quality-of-life impacts throughout West County; enhancements may involve implementing quiet zones, grade separations, train-traffic signal preemption systems, or other measures.
- Transit-13: Work with the City of Hercules to ensure ongoing operations of the Hercules Hub.
- Transit-14: Work with local jurisdictions to study and fund options for improving curb management and commercial and public bus, truck, and van passenger loading on key public streets.
- Transit-15: Participate in current and future studies regarding rail options for the West County area and continue exploring development of new rail stations.
- Transit-16: Work with CCTA, local jurisdictions, and local public transit operators to:
  - Link transit service within the West County subregion, more directly to communities outside the West County subregion, between BART stations, and between adjacent counties.
  - Leverage MTC's effort to standardize operations, regional mapping, and wayfinding.
  - Implement traffic signal management and bus prioritization technology on transit RRS routes to improve bus speed and reliability.
  - Implement the recommendations identified in the Integrated Transit Study.
- Transit-17: Evaluate systemwide bus stop improvements; make it safer and easier for people to access transit stations; and ensure that transit, and its related pedestrian access and connectivity, is safe and attractive.
- Transit-18: Provide educational awareness of public transportation options through outreach, education, incentive and support programs, and advertising, particularly in local schools.
- Transit-19: Work with CCTA and local transit operators to explore financial incentives and reduced fares for public transportation, including a feasibility study to explore a subregional or countywide Universal Basic Mobility program.
- Transit-20: Work with CCTA and MTC to promote Safe Routes to Transit projects and programs and submit applications for funding for construction of local Safe Routes to Transit projects and programs.
- Transit-21: Work with local jurisdictions and transit service providers to reinstate halted neighborhood bus lines where demand exists so it is at or beyond pre-pandemic levels.
- Transit-22: Adopt local policies that prioritize safety for the most vulnerable users at all stages of project planning and delivery.
- Transit-23: Work with CCTA and local transit providers to ensure real-time online transit information for all routes.
- Transit-24: Explore designating transit as the primary mode on San Pablo Avenue.
- Transit-25: Assist local jurisdictions in the development of design guidelines and objective design standards to support transit-oriented development in downtowns, priority development areas (PDAs), transit priority areas, and other areas well-served by transit.

- Transit-26: Work with CCTA and transit providers to identify and prioritize a network of transit corridors for transit signal priority, part-time transit lanes, transit-only lanes, and other transit-focused improvements.
- Transit-27: Develop actions that would reduce the differential between auto travel times and transit travel times during off-peak periods.
- Transit-28: Work with CCTA, WCCTAC, local jurisdictions, and partner agencies to study how to reinstate transit service post-pandemic and to influence both commute and non-commute travel behavior.
- Transit-29: Work with CCTA and the future accessible transportation Coordinating Entity to explore additional RTOs related to accessible transportation for inclusion in the next Action Plan update.
- Transit-30: Work with CCTA and local transit providers to reinstate high-quality transit that operated in the subregion prior to the pandemic.

Chapter 6: Active Transportation

Active transportation in West County includes a variety of different activities—walking, bicycling and electric-assist bicycling, rolling, and micromobility, among others. An increase in active transportation mode share of all trips can help West County reach broad transportation, environmental, and public health goals that are shared by all of Contra Costa and the Bay Area. Active transportation also contributes to improved traffic congestion. Though active transportation modes can use existing infrastructure, a dedicated active transportation network, called the Low-Stress Bicycle Network (LSBN) is planned and published as part of the CCTA 2018 *Countywide Bicycle and Pedestrian Plan* (CBPP). This chapter describes the network and explains the metrics used to complete and track progress toward implementation of a contiguous low-stress network of bicycle paths. The desired contiguous LSBN is shown on Figure 6-1. See Table 6-1 for a summary of active transportation RTOs.

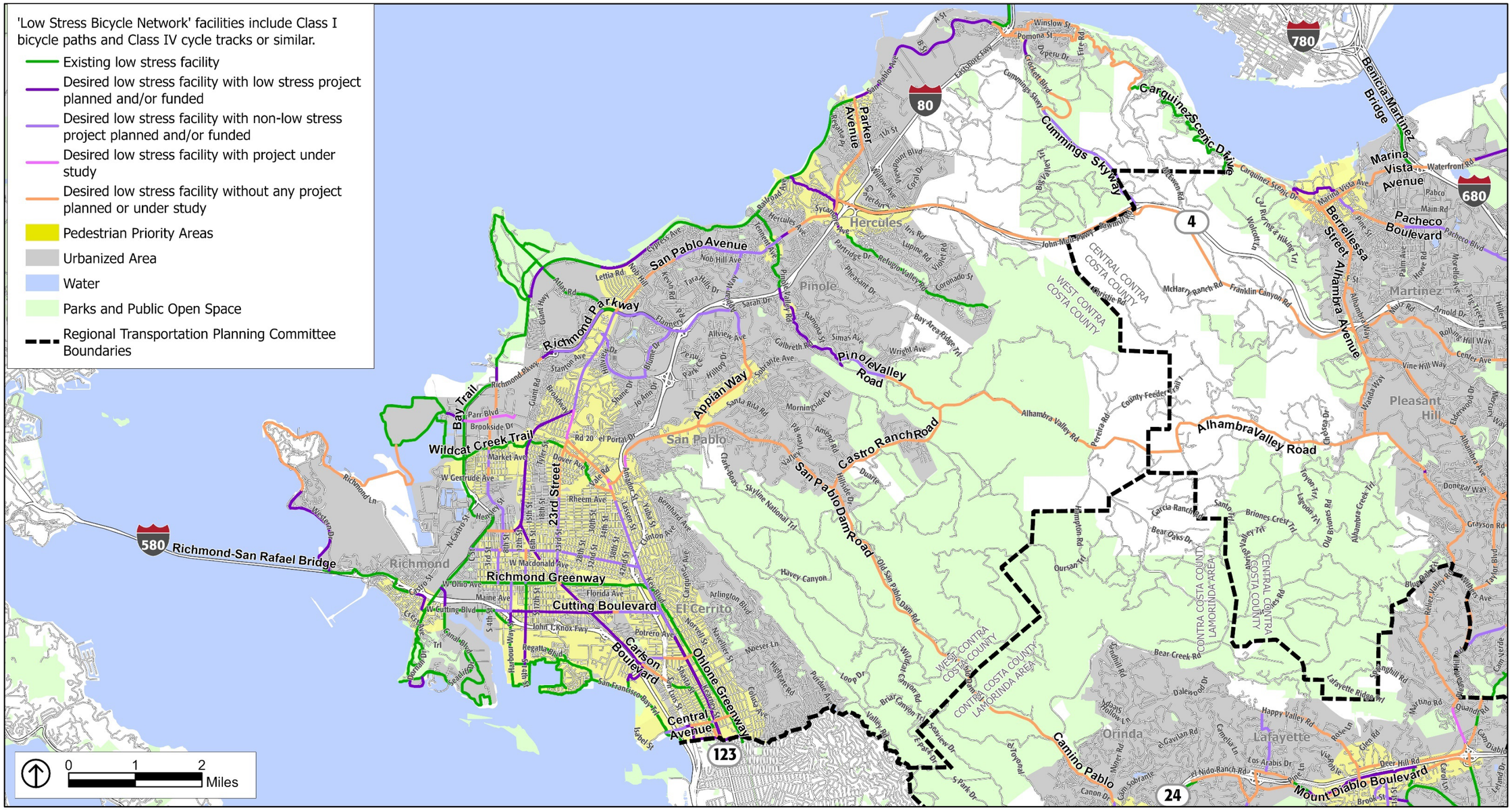
Table 6-1: Summary of Active Transportation Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Active Transportation RTO-1: Active Transportation Mode Share	Increase active transportation mode share	None	7% all trips [a] 2% commute trips	11% all trips 5% for commute trips
Active Transportation RTO-2: Low-Stress Bicycle Network	Increase contiguity and completeness of the LSBN	None	61%	90%
Active Transportation RTO-3: Unprotected Trail Crossings	Eliminate unprotected crossings of the LSBN intersections with roadways	None	No unprotected crossings	No unprotected or semi-protected crossings

a) "All trips" refers to all trips with an origin or destination in West County.

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets.

Figure 6-1: West County Low-Stress Bicycle Network



Source: ABAG/MTC, 2021, 2019; CCTA, 2022; ESRI, 2021; PlaceWorks, 2022.

Note: The status of specific segments on this map is taken from the CCTA 2018 Countywide Bicycle and Pedestrian Plan (CBPP) project list, the revised 2022 CBPP project list, adopted Bicycle and Pedestrian Master Plans from individual jurisdiction, and consultation with local staff. "Desired Low Stress Network" refers to what the entire Low Stress Bicycle Network would look like upon completion, per the 2018 CBPP.

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RTOs

Active Transportation RTO-1: Active Transportation Mode Share

Increase the Mode Share of Bicycling and Walking in the Subregion

As shown in Table 2-2 in Chapter 2, in 2019, less than two percent of West County residents commuted to work through active transportation such as bicycling or walking. This figure is the same for Contra Costa County as a whole. These percentages are anticipated to naturally increase through 2050 to 2.7 and 2.5 percent, respectively, if no change is made. As shown in Table 2-4, in 2019, approximately 6.6 percent of all West County trips were taken via active transportation, compared to 6.5 percent of all countywide trips.

This Action Plan sets a target that active transportation commute trips increase to two percent by 2027 to match pre-pandemic levels, and to increase to five percent by 2050. Further, this Action Plan includes targets that set active transportation mode share for all trips to increase to seven percent by 2027 and 11 percent by 2050. These goals are ambitious but necessary to meet goals to improve public health outcomes, minimize VMT, transportation-related GHG emissions, and traffic congestion.

Active Transportation RTO-2: Low-Stress Bicycle Network

Increase the Proportion of the Countywide Low Stress Bicycle Network Completed in the Subregion

The CBPP introduced a new way of evaluating a facility's level of traffic stress in which roadways are evaluated on several factors, including speed and number of vehicles and presence and width of bicycle facilities. Facilities are given a rating from one (least stressful) to four (most stressful) to evaluate the stress a bicycle rider will experience. The goal of the 2018 CBPP is to ensure the LSBN is complete and rated either Level of Traffic Stress 1 (most people of all ages and abilities can feel safer bicycling on these facilities physically separated from vehicular traffic) or Level of Traffic Stress 2 (the "interested but concerned" adult population will feel safer bicycling on these facilities). Ultimately, construction of the entire LSBN would result in an increase in active transportation mode share and a reduction in KSI collisions.

The status of the entire West County portion of the LSBN is shown on Figure 6-1. If the entire LSBN in the West County subregion were completed, it would have 144.4 miles of low-stress facilities, classified as Class I, Class IIIB, or Class IV.

Table 6-2 shows that 38 percent of West County's LSBN is constructed as of 2022. An additional 15 percent of low-stress facilities are incomplete but have a locally adopted plan to construct the facility toward a more contiguous countywide LSBN. Projects proposing improvements that would not result in low-stress facilities comprise an additional 16 percent of the LSBN, and one additional percent is designated "under study." A total of 30 percent of the total LSBN miles are incomplete and do not have a plan to complete them or to study them further.

This Action Plan proposes that the subregion aim to achieve 90 percent completion of the LSBN by 2050 with an interim target of 61 percent (88.5 miles) completion by 2027. This is the sum of existing completed facilities (38 percent) and 150 percent of the already proposed low-stress additions to the network. This would require completion of the low-stress projects that already have an adopted plan.

Table 6-2: Proportion of West County LSBN Completed (2022)

Status of Facility	Miles	Percentage
Existing Low-Stress Facility	55.2	38%
Desired Low-Stress Facility with Low Stress Project Planned and/or Funded	22.2	15%
Desired Low-Stress Facility with Non-Low Stress Project Planned and/or Funded[a]	22.5	16%
Desired Low-Stress Facility with Project Under Study	1.7	1%
Desired Low-Stress Facility without any Project Planned or Under Study	42.8	30%

a) *This category means that there is a project planned and/or funded in an existing plan that would complete a Class II or Class III facility but not a Class I, Class IIIB, or Class IV facility which are considered low stress.*

Active Transportation RTO-3: Unprotected Trail Crossings

Eliminate the Number of Locations Where the Low-Stress Bicycle Network Has an Unprotected Crossing of a Heavily Traveled Vehicle Route

This metric maps and tracks the status of intersections between the LSBN and heavily traveled roadways,[15] as illustrated on Figure 6-2. The level of protection at each intersection is classified as:

- **Fully protected** by grade separation or a signalized intersection with bicycling protections such as a waiting bay or concrete barriers.
- **Semi-protected** at an at-grade crossing with a beacon system, or with a signal but without pedestrian or cyclist protections through a grade separation.
- **Unprotected** at an at-grade crossing that includes none of the improvements listed above.

As illustrated on Figure 6-2, there are six study intersections in the West County subregion that are currently unprotected and 14 that are considered semi-protected. The unprotected intersections are:

- Ohlone Greenway crossing at Manila Avenue
- Pinole Creek facility crossing San Pablo Avenue
- Pinole Creek facility crossing Henry Avenue
- Richmond Greenway crossing at Harbour Way South
- Richmond Greenway crossing at 2nd Street
- W Cutting Boulevard and S Garrard Boulevard

This Action Plan sets a target to modify the six existing unprotected intersections to become fully protected by 2027. Further, this Action Plan sets a target that the additional 14 semi-protected crossings receive improvements to become fully protected by 2050. These facilities include:

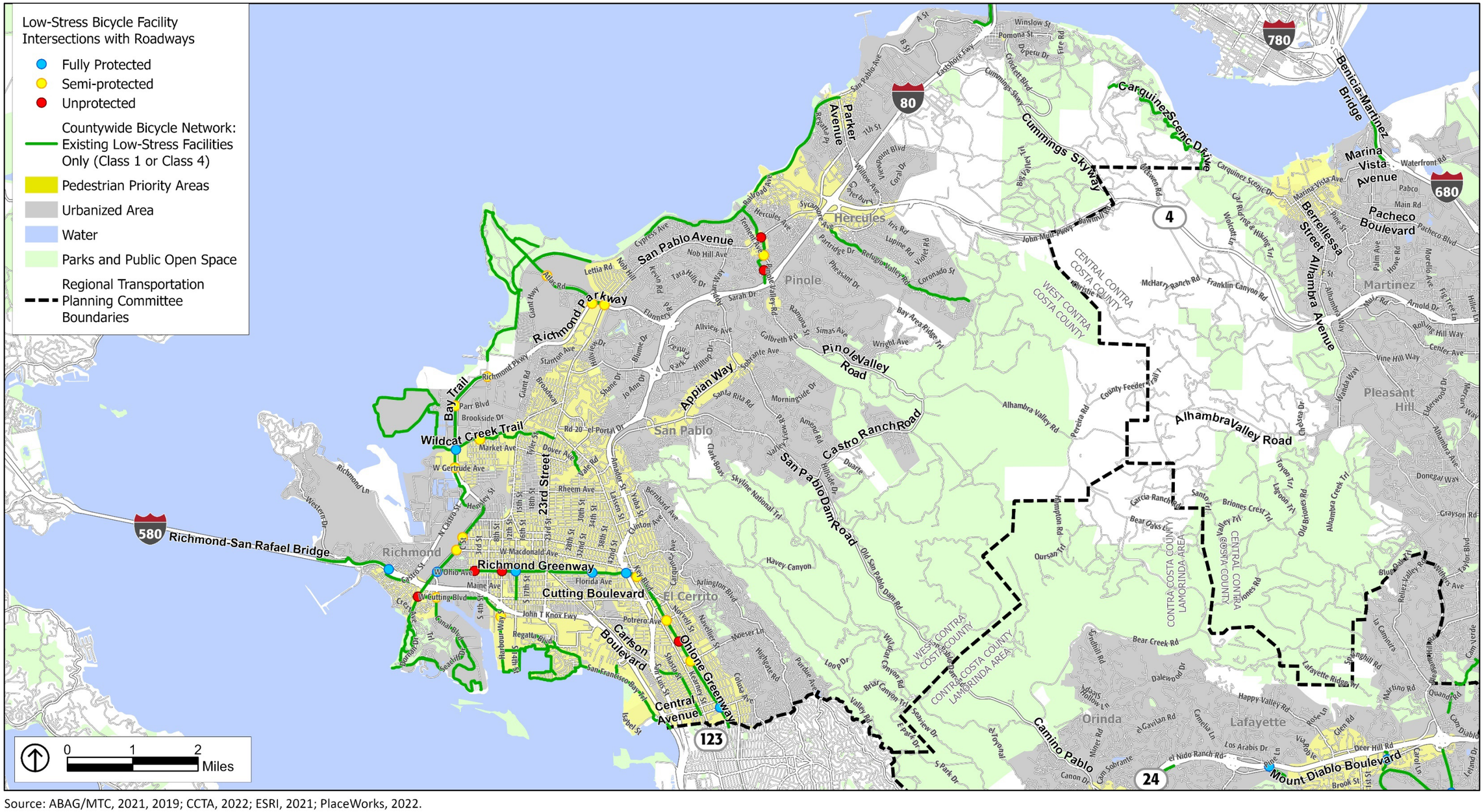
- Atlas Road and Giant Highway
- Richmond Greenway crossing San Pablo Avenue
- Richmond Parkway and West Barrett Avenue
- Richmond Parkway and West Macdonald Avenue
- Richmond Parkway and Goodrick Avenue
- Richmond Parkway and Parr Boulevard

[15] Roadways included in this analysis labeled “heavily traveled” include all roadways except for routes designated as minor connectors, and local or residential routes. Routes that were analyzed include interstates, freeways, expressways, other principal arterials, minor arterials, and major collectors. It is important to recognize that there are other components of the transportation network that can be stressful to bicyclists and pedestrians, including, but not limited to, facilities with many driveway entrances and exits. Such sites are not included in this analysis due to lack of mapping data; however, they are important to consider as LSBN facilities are constructed and maintained.

- Ohlone Greenway at Moeser Lane
- Ohlone Greenway at Potrero Avenue
- Wildcat Creek Trail at Fred Jackson Way
- Richmond Parkway at San Pablo Avenue
- Richmond Parkway at Atlas Road
- Pinole Creek bicycle facility at Tennent Avenue
- Canal Boulevard at Cutting Boulevard
- Harbour Way S crossing with Wright Avenue

As the LSBN is completed, new locations where the LSBN crosses a heavily traveled vehicle route will be added. Local jurisdictions should install fully protected intersection treatments for bicyclists and pedestrians at these locations listed and shown on Figure 6-2.

Figure 6-2: Status of Crossings at Intersections of the Low-Stress Bicycle Network and Heavily Traveled Roadways



Source: ABAG/MTC, 2021, 2019; CCTA, 2022; ESRI, 2021; PlaceWorks, 2022.

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Actions

The following actions are necessary to achieve the RTO targets and implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Active Transportation-1: Work with local and regional jurisdictions to update, adopt, and implement bicycle and pedestrian plans to expand and/or improve facilities to ensure a seamless, safe, and contiguous active transportation network that provides a positive user experience for people traveling for the daily-average distance/duration trip.
- Active Transportation-2: Require land-use development project' scopes to include any change-of-use, to provide lockers and secure short-term bicycle parking and long-term storage options at appropriate locations and seek funding first at key activity centers throughout West County.
- Active Transportation-3: Improve people access and safety, including micromobility, bicyclists, and pedestrians, through and near highway interchange areas. Reduce the maximum potential vehicle speeds, by using the Vision Zero Toolbox and Safe System Approach.
- Active Transportation-4: Conduct a planning and engineering/design feasibility study along Richmond Parkway to reduce impacts from development; manage and balance truck traffic in mixed-flow travel lanes; and overall, recommend bicycle and pedestrian improvements to close gaps and improve safety and connectivity to the Richmond-San Rafael Bridge Bay Trail.
- Active Transportation-5: Construct gap closure projects in the countywide low-stress bicycle facilities network to establish a safe and contiguous network, including, but not limited to:
  - The Richmond Greenway gap at 23rd Street
  - SR-4 between Cummings Skyway and Hercules segment of the LSBN
- Active Transportation-6: Develop local bicycle facilities network links to the regional San Francisco Bay Trail and Richmond and Ohlone Greenways to facilitate contiguous longer-distance bicycle travel through West County and to/from neighboring regions.
- Active Transportation-7: Develop a program to bi-annually provide funds for implementation of the Complete Streets policies of the regional and local jurisdictions.
- Active Transportation-8: Implement the recommendations from the Appian Way Alternatives Analysis and Complete Streets Study.

Parking Electric Devices

Long-term secure e-bicycle and e-scooter parking and storage facilities are important to encourage active transportation and modal shift. These facilities can take the form of on-demand lockers that replace month-to-month rental lockers or entire bicycle rooms.

- Active Transportation-9: Implement recommendations from and update the findings of the countywide Safe Routes to School needs assessment and seek funding for bicycle and pedestrian improvements in West County school areas.
- Active Transportation-10: Work with CCTA, Contra Costa Health Services, and Street Smarts Diablo Region to facilitate a countywide coordinated approach to Safe Routes to Schools programs, and to identify continuous multi-year funding sources to encourage students, employees, visitors, and residents at private and public K-12 schools, technical schools, and college sites to use non-vehicle modes to get to/from school.
- Active Transportation-11: Work with local jurisdictions to promote 511 Contra Costa's active transportation programs that increase awareness of multimodal travel options, travel behavior incentives, and safety through outreach, events, education, social media, marketing, and advertising.
- Active Transportation-12: Continue programs that reduce the cost of using electric bicycles and pursue new programs to reduce the cost of conventional (pedal) bicycle use for Contra Costa residents.
- Active Transportation-13: Work with CCTA, the East Bay Regional Park District, and other partner agencies to develop a method of tracking the Pavement Condition Index (PCI) of bicycle facility segments along the low-stress bicycle network, and implement rehabilitation, repair, and replacement modifications where and as needed.
- Active Transportation-14: Construct bicycle and pedestrian crossing improvements at intersections where the LSBN has an unprotected or semi-protected crossing of a heavily traveled vehicle route:
  - Ohlone Greenway crossing at Manila Avenue
  - Pinole Creek facility crossing San Pablo Avenue
  - Pinole Creek facility crossing Henry Avenue
  - Richmond Greenway crossing at Harbour Way South
  - Richmond Greenway crossing at 2nd Street
  - W Cutting Boulevard and S Garrard Boulevard
  - Atlas Road and Giant Highway
  - Richmond Greenway crossing at San Pablo Avenue
  - Richmond Parkway and West Barrett Avenue
  - Richmond Parkway and West Macdonald Avenue
  - Richmond Parkway and Goodrick Avenue
  - Richmond Parkway at Parr Boulevard
  - Ohlone Greenway at Moeser Lane
  - Ohlone Greenway at Potrero Avenue
  - Wildcat Creek Trail at Fred Jackson Way

- Richmond Parkway at San Pablo Avenue
- Richmond Parkway at Atlas Road
- Pinole Creek bicycle facility at Tennent Avenue
- Canal Boulevard at Cutting Boulevard
- Harbour Way S crossing with Wright Avenue

- Active Transportation-15: Work with CCTA to conduct, update, and implement a comprehensive countywide Pedestrian Needs Assessment.
- Active Transportation-16: Work with CCTA and local jurisdictions to explore installation of e-bicycle charging infrastructure in publicly accessible and convenient places, including trails, shared mobility hubs, existing and planned electric vehicle (EV) charging locations, and near commercial/retail establishments.
- Active Transportation-17: Develop a planned alignment and secure land tenure as needed to realign the Bay Trail route between Hensley Street and Gertrude Avenue to the western side of Castro Street and the Richmond Parkway.
- Active Transportation-18: Work with CCTA on an ongoing basis to update the LSBN adopted in the 2018 Countywide Bicycle and Pedestrian Plan.

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Chapter 7: Roadways

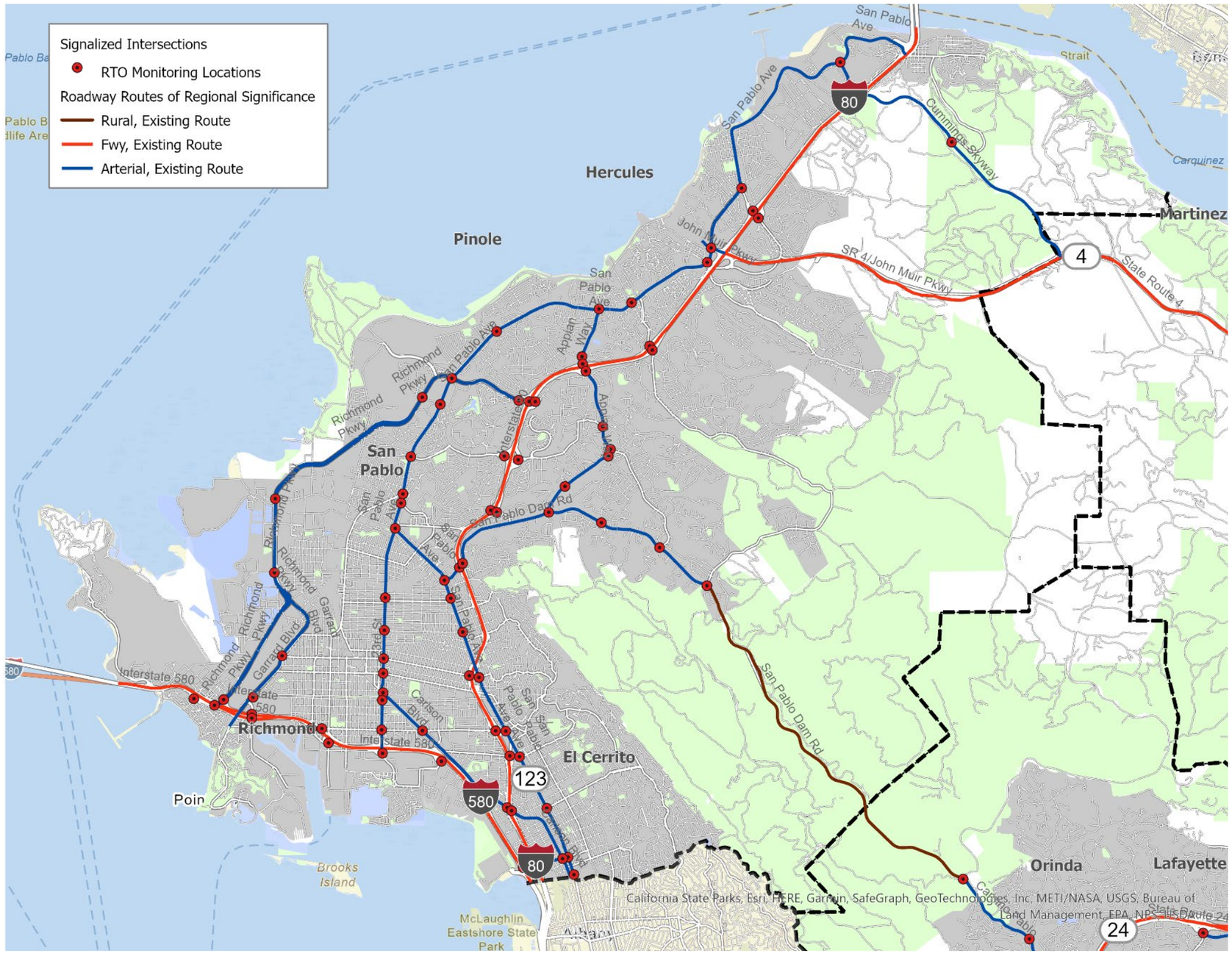
The transportation system in West County, much like the rest of the United States, is built for and around the automobile. While non-automobile modes can use them, roadways are primarily geared to the personal automobile and vehicle traffic. This Action Plan monitors roadway and vehicles to ensure service on West County roadways is adequate. However, it is the intention of this Action Plan that the share of personal automobile travel decreases, particularly SOVs, and that West County roadways become more multimodal over time. Refer to other chapters in this Action Plan to see RTOs and Actions to achieve these goals. It may be the case that some actions in this chapter conflict with the actions in other chapters of this Action Plan. If such a conflict occurs, it will be up to the individual jurisdiction to weigh project or program benefits against one another and the goals of this Action Plan, the subregion, and Contra Costa as a whole. Table 7-1 summarizes roadway RTOs. Figure 7-1 shows the West County roadway segments and intersections evaluated in this chapter.

Table 7-1: Summary of Roadway Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Roadways RTO-1: Freeway Delay Index	Maintain current delay index	I-580: 2.5 or less I-80: 3.0 or less SR-4: 2.0 or less	I-580: 2.5 or less I-80: 3.5 or less SR-4: 2.0 or less	I-580: 2.5 or less I-80: 3.5 or less SR-4: 2.0 or less
Roadways RTO-2: Freeway Buffer Index	Maintain current buffer index	None	0.5	0.5
Roadways RTO-3: Intersection Level of Service (LOS)	Maintain LOS at RTO monitoring locations	LOS D LOS E on San Pablo Avenue and San Pablo Dam Road	LOS D In all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or Transit Priority Areas (TPAs)	LOS D In all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or TPAs
Roadways RTO-4: Roadway Segment LOS	Maintain LOS on two-lane roadways outside of urban areas	None	LOS E (≤40 miles per hour)	LOS E (≤40 miles per hour)

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets

Figure 7-1: Map of RTO Monitoring Locations and Segments



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Freeway RTOs

Freeway RRS in the West County subregion include:

- I-580 from the Alameda County Line to the Marin County Line.
- I-80 from the Alameda County Line to the Solano County Line.
- SR-4 from I-80 to Cummings Skyway.

Roadways RTO-1: Freeway Delay Index

Maintain Peak-Hour Delay Index on Select Freeway Segments

The delay index is a measure of delay experienced by motorists on a roadway segment during a peak commute hour in a single direction. The delay index is calculated by measuring the time it takes to travel a segment of road during peak-period congested conditions and comparing it to the time it takes to travel the same segment during uncongested, free-flow conditions. The delay index may also be calculated as the ratio of congested speed to uncongested speed, given that the distance is fixed on any given corridor.

The observed baseline and modeled results for freeway delay index on the freeway RRS are shown in Table 7-2. As shown, freeway corridors with especially high levels of delay (greater than 1.5 delay index) include I-80 (westbound in the morning and eastbound in the afternoon) and I-580, where the delay index is greater than 3.0 in the westbound direction in the morning (this result likely reflects delay at the Richmond Bridge toll plaza).

Based on current performance and the future modeled performance, this Action Plan carries forward the delay index standards in the 2017 West County Action Plan, which are 2.5 or less for I-580 and 2.0 or less for SR-4. This Action Plan sets a new target for I-80 of 3.5 or less, which is 0.5 higher than the 2017 West County Action Plan.

Roadways RTO-2: Freeway Buffer Index

Maintain Peak-Hour Freeway Segment Buffer Index on Select Freeway Segments

The buffer index represents the buffer time (or time cushion) that most travelers add to their average travel time when planning trips to ensure on-time arrival. This extra time is added to account for any unexpected delay. The buffer index is expressed as a percentage, and its value increases as reliability gets worse. For example, a buffer index of 40 percent means that, for a 20-minute average travel time, a traveler should budget an additional eight minutes (20 minutes × 40 percent = 8 minutes) to ensure on-time arrival most of the time. In this example, the eight extra minutes are called the buffer time. The buffer index is computed as the difference between the 95th percentile travel time and average travel time, divided by the average travel time.

Observed baseline and modeled results are shown in Table 7-2. The observed buffer index for existing conditions and peak direction of travel ranges from 0.04 to 0.85, reflecting a high degree of travel-time variability in some of the corridors. In particular, the I-580 morning a.m. operations seem especially variable.

This Action Plan sets a performance target for the buffer index at 0.50, which means that the extra travel time that must be considered for travelers would be no more than half of the average travel time over the corridor.

For comparison, this section also provides the buffer index for BART trips from the West County area.

- For an AM peak trip from Richmond BART station to the MacArthur station in Oakland, the average trip time is 19 minutes, while 95 percent of trips occur in 21 minutes or less. This means that the buffer time for this BART trip is only two minutes in addition to an average trip time of 19 minutes, which represents a buffer index of 0.11 (2 ÷ 19).
- For a PM peak trip from the MacArthur station in Oakland to the Richmond BART station, the average trip time is also 19 minutes, while 95 percent of trips occur in 23 minutes or less (two minutes higher than in the AM peak time). This means that the buffer time for this BART trip is four minutes in addition to an average trip time of 19 minutes, which represents a buffer index of 0.2 (4 ÷ 19).

These buffer indexes for BART are better than most of the observed buffer index or the target buffer index for peak-hour, peak-direction trips noted for freeways in this RTO.

Table 7-2: Observed and Baseline Modeled Conditions: Freeways

Route of Regional Significance	2019 Observed			2050 Baseline Modeled	
	Avg Speed (MPH) [a]	Delay Index	Buffer Index	Avg Speed (MPH) [a]	Delay Index
Interstate 580					
Eastbound – a.m.	50.9	1.28	0.44	58.3	1.11
Eastbound – p.m.	58.8	1.10	0.09	44.3	1.47
Westbound – a.m. [b]	19.8	3.28	0.85	28.3	2.29
Westbound – p.m.	60.6	1.07	0.08	29.2	2.23
Interstate 80					
Eastbound – a.m.	60.8	1.07	0.04	43.6	1.49
Eastbound – p.m.	28.8	2.26	0.51	17.0	3.82
Westbound – a.m.	38.2	1.70	0.45	16.8	3.86
Westbound – p.m.	61.5	1.06	0.17	43.7	1.49
State Route 4					
Eastbound – a.m.	56.6	1.15	0.11	54.5	1.19
Eastbound – p.m.	59.3	1.10	0.15	54.9	1.18
Westbound – a.m.	60	1.08	0.12	54.2	1.20
Westbound – p.m.	63	1.03	0.09	54.9	1.18

a) Average speed over corridor as a whole.

b) The observed average speed, delay index, and buffer index for westbound a.m. commute is attributed to the slow-down at the Richmond-San Rafael Bridge Toll Plaza.

Surface Roadway RTOs

Roadways RTO-3: Intersection LOS

Maintain Peak-Hour LOS at RTO Monitoring Locations in Urban Areas

This RTO is applied to signalized intersections (referred to as RTO Monitoring Locations) along specific defined arterial RRS. Signalized Intersection LOS is a delay-based qualitative measure of traffic conditions at a signalized intersection. LOS is expressed in ratings from A through F, with A meaning that all traffic clears the intersection in every cycle and F meaning that drivers must wait through multiple cycles to clear the intersection. Signalized intersection LOS is determined based on intersection turning movement counts (also called turning/traffic volumes), intersection geometry, and signal timing data. The CCTA Technical Procedures specify that methods documented in the latest edition of the *Highway Capacity Manual* be used to measure signalized intersection LOS.[16] The relationship between average control delay and LOS is shown in Table 7-3, and the RTO monitoring locations analyzed for LOS are shown in Table D-1 in Appendix D, Transportation Modeling Results.

Although no longer required by State law after the passage of Senate Bill 743, understanding LOS is important as changes occur in the physical environment. Understanding LOS can help local jurisdictions see progress in transportation policies and decisions to influence travel behavior, test the success of various transportation system improvements, and understand where conflict may occur in the transportation system. For instance, low LOS at an intersection can impede travel of emergency responders. With LOS rating on hand, local jurisdictions can make decisions about where improvements may need to occur to lessen potential conflicts and ensure the transportation system serves all who rely on it.

Congestion in downtown areas often results from economically and socially positive increased activity, so it is considered acceptable. Congestion at freeway ramps is often unavoidable since large numbers of trips are concentrated in areas where motorists get onto freeways. Therefore, this Action Plan sets performance targets for RTO Monitoring Locations LOS for the West County subregion as follows:

- LOS D in all areas except downtowns, at key schools, and freeway ramps.
- LOS E at freeway ramps.
- No LOS standard for downtowns, key schools, or TPAs.

[16] The 7th edition of the *Highway Capacity Manual* was published by the Transportation Research Board in January 2022.

This Action Plan carries forward LOS flexibility in Pedestrian-Bicycle-Transit (PBT) zones, as outlined in the existing West County Action Plan. Within specific PBT zones, the RTOs specified in this document will not be applied; instead, the performance standards defined in the relevant jurisdiction's general plan and/or specific plan covering that area will govern. PBT zones shall be within a PDA and are typically areas where transit and active transportation modes are given priority over passenger vehicles.

Table 7-3: Intersection LOS Definitions

Control Delay (Seconds/Vehicle)	Level of Service (LOS)
≤10	A
>10–20	B
>20–35	C
>35–55	D
>55–80	E
>80	F

Source: Highway Capacity Manual, 6th edition, Exhibit 19-8

Roadways RTO-4: Roadway Segment LOS

Maintain Peak-Hour Segment LOS on Selected Two-Lane Roadways Outside of Urban Areas

Roadway segment LOS is a measure of traffic efficiency and smoothness of flow along roadway segments that are not constrained by a nearby traffic signal. This has been calculated using methods specified in the 2010 *Highway Capacity Manual* using average speed for Class I highways (Class I highways are two-lane facilities in largely rural areas that motorists expect to traverse at relatively high speed).

For the West County subregion, this metric is applied only to San Pablo Dam Road from Castro Ranch Road to Bear Creek Road. The segment LOS is related to average speed, as shown in Table 7-4. Table 7-5 lists the two-lane roadway corridors analyzed for the West County subregion and reports the existing and forecasted LOS. The observed average speed for existing conditions varies between 41 and 49 mph, corresponding to LOS C and D. The modeled average speeds for 2050 are lower than the observed 2019 average speeds.

This Action Plan sets a performance target for this metric at LOS E on San Pablo Dam Road, which appears to be achievable through 2050, and which corresponds to an average speed across the corridor of under 40 mph.[17]

[17] Note that a speed of 40 mph is modeled for portions of San Pablo Dam Road that are outside of urban areas and it is possible that speeds decrease in more urbanized portions of the roadway.

Table 7-4: LOS for Two-Lane Roadways

LOS	Average Speed (MPH)
A	>55
B	>50-55
C	>45-50
D	>40-45
E	≤40
F	>55

Source: Highway Capacity Manual 6th edition, Exhibit 15-3

Table 7-5: Corridor LOS for Two-Way Roadways Outside Urban Areas

Route of Regional Significance	Time of Day	Direction	2019		2050	
			Avg Speed (MPH)	LOS	Avg Speed (MPH)	LOS
San Pablo Dam Road	A.M.	EB	41.6	D	39.5	E
San Pablo Dam Road	P.M.	EB	49.4	C	39.8	E
San Pablo Dam Road	A.M.	WB	47.3	C	39.8	E
San Pablo Dam Road	P.M.	WB	46.3	C	30.5	E

Source: Inrix Roadway Analytics, CCTA Travel Demand Model

Actions

The following actions are necessary to achieve the RTO targets and implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Roadways-1: Complete necessary operational improvements (e.g., protected turn lanes, synchronized signal timing, auxiliary lanes) on freeways, at intersections, and on roadway segments that are needed to maintain the RTOs in this Action Plan, while balancing these improvements against the objectives and actions regarding other modes and issues covered by this Action Plan.
- Roadways-2: Complete the reconstruction of the I-80/San Pablo Dam Road interchange.
- Roadways-3: Complete the improvements associated with the I-80/Central Avenue interchange.
- Roadways-4: Implement transit priority improvements in the West County service area and continue to work with Caltrans on refinement and monitoring of the Integrated Corridor Management (ICM) program.
- Roadways-5: Reconstruct part or all of the SR-4 and I-80 interchange to improve transit access to the Hercules Transit Center, and work with local jurisdictions to identify any other ramp reconfiguring projects.
- Roadways-6: Implement the recommended actions in WCCTAC's I-80 Corridor System Management Plan.
- Roadways-7: Work with CCTA to complete a countywide goods movement plan that promotes greater use of technology for communications and scheduling, funding for equipment upgrades for air quality improvements with cleaner technology, and an advocacy platform for goods movement and guidance for local jurisdictions.
- Roadways-8: Improve the operational efficiency of freeways and arterial streets through effective corridor management strategies, such as ramp metering, traffic operations systems, Intelligent Transportation Systems improvements, HOV/HOT lane and bypass lanes, and others to support a cohesive transportation system for all modes.
- Roadways-9: Work with CCTA, Caltrans, California Highway Patrol, and local jurisdictions to continue studying the feasibility of pilot and long-term programs for bus on shoulder, which may include examining legislation that should change.
- Roadways-10: Work with CCTA, Caltrans, and California Highway Patrol to develop a program to track HOV/HOT and toll lane violators.

- Roadways-11: Work with CCTA and local jurisdictions to develop a program to discourage diversion from freeways and cut-through travel on surface roadways by developing traffic management programs, increasing trip capacity on freeways, completing freeway operational improvements, implementing traffic-calming measures on surface roadways, and exploring surface roadway redesign to support active and public transit modes.
- Roadways-12: Develop a program to establish, operate, and maintain existing and additional public or private park-and-ride facilities at appropriate locations, including shared-use agreements at activity centers with underutilized parking spaces.
- Roadways-13: Participate in evaluations of West County freeways that may involve proposed changes to managed lanes, such as HOV lane modifications, special-purpose lanes, or HOT/Express Lanes.
- Roadways-14: Maintain pavement management systems and schedules and continue to seek additional funding for local roadway maintenance.
- Roadways-15: Conduct a study to consider modifications to 23rd Street to convert it to a balanced multimodal corridor that emphasizes transit and active transportation over vehicles, building on the concepts that are already in the City of San Pablo's 23rd Street Specific Plan and the Richmond Bay Specific Plan.
- Roadways-16: Work with WCCTAC, local jurisdictions, and CCTA to seek funding to implement recommendations of the North Richmond Truck Route Study (or other mutually agreed-upon implementation measures) to improve connectivity to designated truck routes, discourage nonlocal heavy truck traffic on local streets, and improve public health and safety in West County communities.
- Roadways-17: Explore options to extend the truck-climbing lane on Cummings Skyway and to implement a Class II bicycle lane on Cummings Skyway between San Pablo Avenue and Franklin Canyon Road.
- Roadways-18: Participate in the San Pablo Avenue Multimodal Corridor Study with the goal of enhancing the street as a multimodal corridor and implement the recommendations from the study once it is approved.
- Roadways-19: Develop one or more subregional corridor plans for key streets such as 23rd Street and Richmond Parkway to provide adequate roadway capacity for local and subregional travel while also including both public transit and active transportation modes and nonmodal transportation issues, such as equity, climate change, safety, and technology.
- Roadways-20: As part of the CTP process, study roadway improvements along key RRS, to include roadway cross-sections showing changes to lane configurations, sidewalks, bicycle facilities, shoulders, and other roadway components.
- Roadways-21: Work with relevant partner agencies to conduct long term West County emergency evacuation planning studies which will include, but are not limited to, traffic signal upgrades necessary for evacuation counterflow signal operations.

Chapter 8: Safety

The safety of the transportation system is a serious public health issue that affects each person that lives, works, or recreates in West County, regardless of their age or the mode by which they travel. Whether someone is traveling in a vehicle or using active transportation, there is risk of collision on any transportation facility. It is the goal of West County, in conjunction with many jurisdictions around the world, to eliminate the number of collisions that occur, particularly collisions between vehicles and those using active transportation modes. CCTA has published the *Vison Zero & Systemic Transportation Safety "How To" Policy and Implementation Guide* and encourages local jurisdictions to adopt and implement Vison Zero action plans. In addition, an objective in the CCTA 2018 CBPP is to "reduce the rate of pedestrian and bicycle fatalities and injuries per capita" and to create an environment of healthy, equitable mobility for all. In alignment with the Vision Zero philosophy, this Action Plan sets performance targets at zero fatalities and severe injuries for all collisions. See Table 8-1 for a summary of safety RTOs.

Table 8-1: Summary of Safety Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Safety RTO-1: KSI Collisions	Eliminate collisions that result in fatality or severe injury	None	Zero fatality and severe injury collisions [a]	
Safety RTO-2: Active Transportation Collisions	Eliminate collisions involving users of active transportation	None		
Safety RTO-3: Active Transportation Collisions near Schools [b]	Eliminate active transportation-involved collisions occurring within 500 feet of schools	None		

a) CCTA codified Vision Zero work through Resolution 21-40-G, which adopts the Contra Costa Countywide Transportation Safety Policy and Implementation Guide for Local Agencies.

b) Schools in this analysis refer to all public and private grade K-12 schools.

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets.

RTOs

The RTOs in this section are based on the injury and fatality collisions reported by the Transportation Injury Mapping System (TIMS).[18] TIMS collision records represent cleaned and geocoded data compiled by the Statewide Integrated Traffic Records System maintained by the California Highway Patrol. The statistics reflect the most recent complete four years of available data but exclude data from 2020 due to pandemic conditions. Therefore, TIMS data used in this Action Plan include January 1, 2016, through December 31, 2019. CCTA and the West County jurisdictions understand that there have been collisions since this time and that they may occur in locations that are not captured in these point-in-time data. However, these data are intended to be a sampling and do not represent all KSI collisions. The number of collisions reported in this chapter are recognized to represent an undercount of total collisions because not all collisions, especially minor ones, are reported to the police.

[18] Transportation Injury Mapping System (TIMS), Safe Transportation Research and Education Center, University of California, Berkeley, 2022.

Safety RTO-1: KSI Collisions

Eliminate Killed or Severely Injured (KSI) Collisions in the Subregion

This RTO tracks the number of severe injury or fatality collisions from the TIMS data set between the years of 2016 and 2019.[19] This RTO includes all collisions that occur in the subregion and not exclusively collisions between vehicles and bicycles and pedestrians. The collision locations are depicted on Figure 8-1 and Table 8-2 summarizes the collisions by type.

Between 2016 and 2019, there were 413 severe injury or fatality collisions throughout West County—76 fatal collisions and 337 severe injury collisions. The most common types of collision were vehicle/pedestrian, cars hitting objects, and broadside collisions.

Safety RTO-2: Active Transportation Collisions

Eliminate Collisions in the Subregion that Involve Users of Active Transportation

This RTO tracks the number of active transportation-involved collisions from the TIMS data set. The collision locations for the West County subregion are depicted on Figure 8-1 and summarized by severity in Table 8-3. Between 2016 and 2019, there were 588 active transportation-involved collisions, including about 14 percent of all injury and fatality collisions. Thirty of the active transportation collisions resulted in fatalities and 102 resulted in severe injury.

Safety RTO-3: Active Transportation Collisions Near Schools

Eliminate Active Transportation Collisions within 500 Feet of a School

This RTO tracks the number of active transportation-involved collisions that occur within 500 feet of school campuses. These collision locations are also depicted on Figure 8-1. A total of 68 collisions occurred near school campuses, 48 of which involved collision with a pedestrian and 21 with a bicyclist, including one that involved both a pedestrian and bicyclist. These collisions also include one fatal collision.

[19] This Action Plan uses a collision data timeframe of four years due to skewed data in 2020 from the COVID-19 pandemic.

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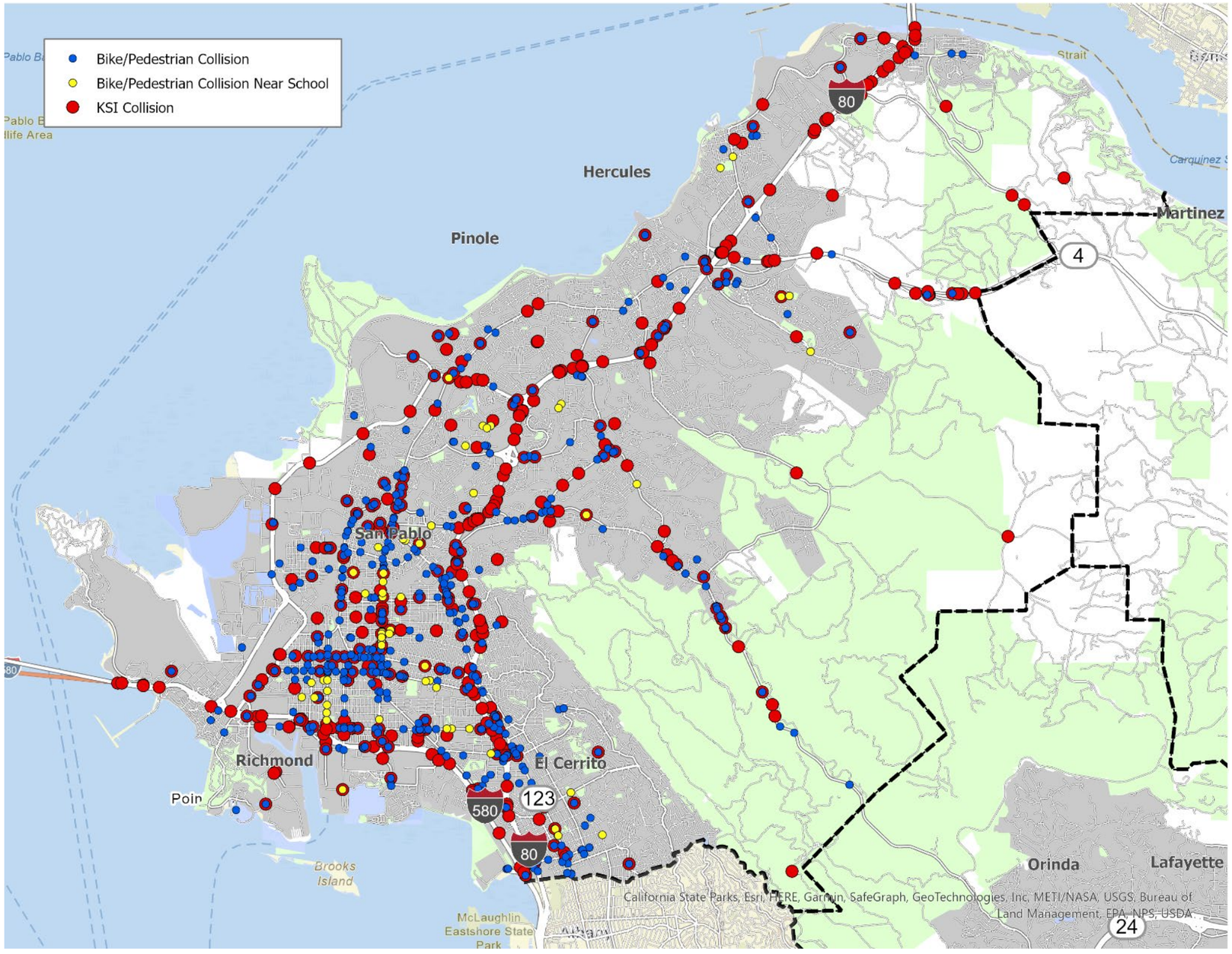
Figure 8-1: KSI and Active Transportation-Involved Collisions (2016-2019)[20]



[20] Note that KSI collisions involving a bicycle or pedestrian are shown with both a blue and red dot.

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Table 8-2: KSI Collisions by Type: West County Subregion, January 1, 2016, through December 31, 2019

Collision Type	2016	2017	2018	2019	Number of Collisions
Not Stated	2	1	---	1	4
Head-On	10	6	11	10	37
Sideswipe	10	11	8	10	39
Rear-End	13	6	20	15	54
Broadside	13	11	22	23	69
Hit Object	23	17	18	23	81
Overturned	3	5	3	10	21
Vehicle/Pedestrian	18	25	28	26	97
Other	2	2	3	4	11
Total	**94**	**84**	**113**	**122**	**413**

Source: Transportation Injury Mapping System and DKS Associates.

Table 8-3: Active Transportation Collisions by Severity: West County Subregion, January 1, 2016, through December 31, 2019

Severity of Injury	2016	2017	2018	2019	Total Active Transportation Collisions
Fatal	6	6	8	10	30
Injury (Severe)	22	23	29	28	102
Injury (Other Visible)	53	54	37	61	205
Injury (Complaint of Pain)	44	60	83	64	251
Total	**125**	**143**	**157**	**163**	**588**

Source: Transportation Injury Mapping System and DKS Associates.

Actions

The following actions are needed to achieve the RTO targets and to implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Safety-1: Work with regional and local agencies, including Contra Costa Health Services/Contra Costa Public Health, to increase the level of multimodal public awareness about bicycle and pedestrian safety and to reduce and prevent injuries due to vehicle-involved collisions.
- Safety-2: Work with CCTA to develop a program to coordinate the collection and analysis of safety data, identify areas of concern where concentrations of collisions occur, and propose safety-related improvements and user awareness to support state and federal safety programs and performance measures.
- Safety-3: Work with CCTA, California Highway Patrol, and Caltrans to prepare an incident management plan for West County freeways.
- Safety-4: Work with CCTA to implement the Countywide Vision Zero Framework and Safe System Approach to project scoping and delivery.
- Safety-5: Conduct a study, led by WCCTAC, to identify all safety-related transportation improvements needed within 500 feet of schools.
- Safety-6: Work with CCTA, MTC, and East Bay Regional Parks District (EBRPD) to study and mitigate the safety impacts of electric bicycles and other micromobility devices on local trails and streets, with the aim of eventually allowing electric bicycles, e-scooters, and other micromobility devices on all of these facilities.

Project Highlight!

East Bay Regional Parks District Board of Directors approved a one-year pilot program in 2017 to allow e-bicycles on three regional trails.

- Safety-7: Improve the safety of high-incident local roadways through physical changes, signage, technology, education, enforcement, or other tools.

Chapter 9: Equity

All members of the West County community should have equal access to various transportation options, jobs, and services. The West County subregion has several Equity Priority Communities (EPC) whose residents are 70 percent or more people of color and are documented to have lower socioeconomic status than the Bay Area as a whole. In West County, there is a total of 11,116 acres of EPC areas, which makes up 19 percent of the entire West County subregion. Therefore, this Action Plan looks at several components of the transportation system in terms of access to mobility, jobs, and services, as well as the health benefits of such access. See Table 9-1 for a summary of equity RTOs.

Table 9-1: Summary of Equity Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Equity RTO-1: EPC Low-Stress Bicycle Network	Proportion of the LSBN that is complete in EPCs, as compared to West County as a whole	None	Maintain level of LSBN completion to match or exceed that of West County as a whole	
Equity RTO-2: Collisions in EPCs	Proportion of KSI collisions that occur in EPCs, as compared to West County as a whole	None	Decrease collision rates to match West County as a whole	
Equity RTO-3: EPC Job Access: Driving	Share of jobs accessible by EPC residents with a 30-minute drive, as compared to West County as a whole	None	Increase job access to match West County as a whole	
Equity RTO-4: EPC Job Access: Transit	Share of jobs accessible by EPC residents with a 45-minute transit trip, as compared to West County as a whole	None	Maintain existing job access to match or exceed that of West County as a whole	
Equity RTO-5: EPC Access to High-Quality Transit	Total number of EPC acres within a high-quality transit buffer, as compared to West County as a whole	None	Maintain access to high-quality transit to match or exceed that of West County as a whole	

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets.

RTOs

Equity RTO-1: EPC Low-Stress Bicycle Network Completion

Ensure that the Proportion of the Countywide LSBN That Has Been Completed in EPCs is Equal to or Greater Than the Proportion Completed in the Subregion as a Whole

The status of the entire West County portion of the LSBN is shown on Figure 9-1. If the entire LSBN in the West County subregion were completed, it would result in 144.6 miles of Class I, Class IIIB, and Class IV facilities.

Table 9-2 breaks down the portions of the LSBN that are at varying stages of completion in both the entire subregion and in EPC areas. Table 9-2 shows that 38 percent of the LSBN is already complete subregion-wide with slightly more, 39 percent, complete in West County EPCs. A lower proportion of the LSBN has a project planned and/or funded to complete a low stress facility, with 22 percent in EPCs compared to 15 percent subregion-wide. The case is similar for portions of the LSBN in EPCs that have a non-low-stress facility planned and/or funded—21 percent in EPCs compared to 16 percent subregion-wide. EPC areas also have a slightly higher proportion of the LSBN under study—three percent compared to one percent for non-EPC areas. The proportion of the LSBN with no low-stress facility planned or under study is higher for the subregion—30 percent subregion-wide compared to only 15 percent in EPCs. Therefore, EPCs are generally better off in terms of having LSBN projects planned and/or funded and having other active transportation improvements (non-low-stress) proposed or under study.

This Action Plan sets a performance target for the subregion to maintain the level of LSBN completion to either match or exceed that of the entire West County subregion. As shown in Table 9-2 and described previously, West County EPCs already fare better than non-EPCs in West County in regard to LSBN completion.

Table 9-2: Proportion of the West County LSBN that is Complete in EPCs

Status of Facility	Entire Subregion Miles	Entire Subregion Percentage	West County EPC Miles	West County EPC Percentage
Existing Low-Stress Facility	55.2	38%	20.1	39%
Desired Low-Stress Facility with Low-Stress Project Planned and/or Funded	22.2	15%	11.6	22%
Desired Low-Stress Facility with Non-Low-Stress Project Planned and/or Funded	22.5	16%	11	21%
Desired Low-Stress Facility with Project Under Study	1.7	1%	1.7	3%
Desired Low-Stress Facility without any Project Planned or Under Study	42.8	30%	7.7	15%

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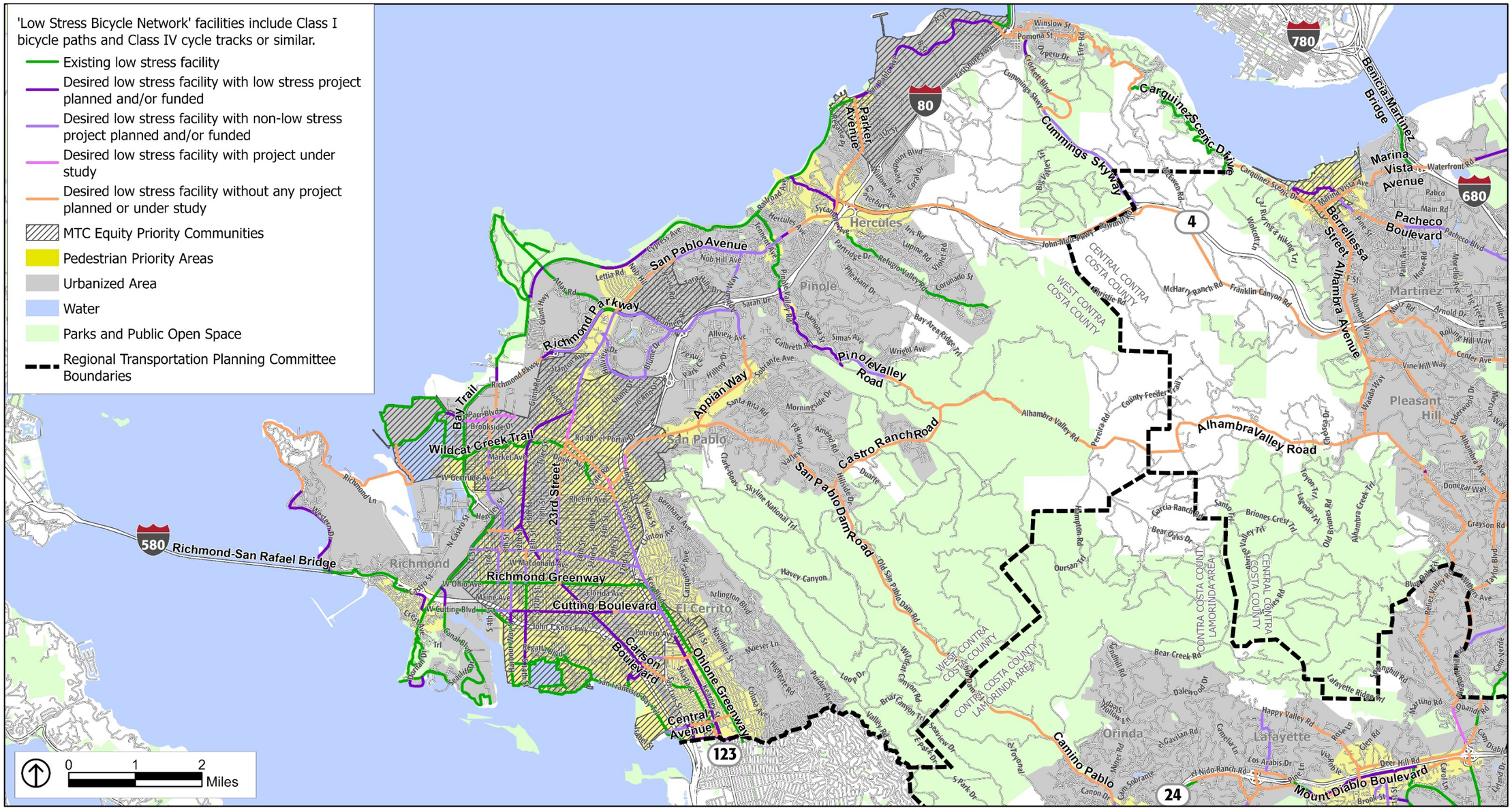
Figure 9-1: West County Low-Stress Bicycle Network in EPCs



Source: ABAG/MTC, 2021, 2019; CCTA, 2022; ESRI, 2021; PlaceWorks, 2022.

Note: The status of specific segments on this map is taken from the CCTA 2018 Countywide Bicycle and Pedestrian Plan (CBPP) project list, the revised 2022 CBPP project list, adopted Bicycle and Pedestrian Master Plans from individual jurisdiction, and consultation with local staff. "Desired Low Stress Network" refers to what the entire Low Stress Bicycle Network would look like upon completion, per the 2018 CBPP.

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Equity RTO-2: Collisions in EPCs

Ensure that the Proportion of KSI and Active Transportation-Involved Collisions in EPCs in the Subregion is Equal to or Less Than the Proportion of the Subregion's Population Living Outside EPCs

This metric tracks the rate of collisions that occur within EPCs compared to the rate for the entire West County subregion. The intention of this RTO is that the rate of KSI and active transportation-involved collisions is not more concentrated in EPCs than in non-EPC areas. Tracking this information allows CCTA, WCCTAC, and West County jurisdictions to evaluate any infrastructure or other improvements that may need to be made to increase safety in EPCs. As shown in Table 9-3, the collision rates in EPCs in West County for 2016 to 2019 are far higher (1.39 collisions per 1,000 population) than the rate in West County as a whole (0.39 collisions per 1,000 population). The overall goal of this RTO is to ensure that this disparity in collision rates between EPCs and non-EPCs does not exist. As identified in Chapter 8, this Action Plan adopts targets of zero KSI or active transportation-involved collisions in West County, congruent with Vision Zero initiatives. Therefore, the implied goal of Equity RTO-2 is that there are also zero KSI or active transportation-involved collisions in West County EPCs. Actions in this plan are intended to improve roadway safety in West County's EPC to address this disparity.

Table 9-3: KSI and Active Transportation-Involved Collision Rates

Collision Type	Number of Collisions (2016-2019)		2019 Population [a]		Avg. Annual Collisions (1,000s) per Population	
	West County	West County EPCs	West County	West County EPCs	West County	West County EPCs
KSI	413	211	266,824	38,086	0.39	1.39
Active Transportation-Involved	588	419	266,824	38,086	0.55	2.75

a) Population from American Community Survey 2019 Five Year Estimates Table B01003.

Equity RTO-3: EPC Job Access: Driving

Ensure That the Number of Jobs That Can Be Reached by EPC Residents with a 30-Minute Drive Is Equal to or Greater than the Number of Jobs That Can be Reached with a 30-Minute Drive by All Residents in the Subregion

This metric conveys the average number of jobs per capita within a 30-minute peak period drive for all West County TAZs compared to all TAZs within West County EPCs. The number of jobs corresponds to those used in the travel demand model demographic inputs. As shown in Table 9-4, within a 30-minute drive, there are on average 491 accessible jobs per West County subregion resident and 465 accessible jobs per West County subregion resident within an EPC. By 2050, the averages are projected to increase to 620 and 644, respectively. This means that there was an average of 26 fewer

jobs per capita accessible by driving to West County residents that live inside of an EPC in 2019 when compared to West County as a whole. Projections for 2050 predict that this gap will close, and EPC residents will end up with 24 more jobs per capita accessible by a 30-minute drive than those living in West County as a whole.

The Action Plan sets a performance target for this RTO that the average number of jobs per capita within the EPCs that are accessible by a 30-minute drive should be at least equivalent to that for the subregion as a whole. As noted previously, this target is not currently being met, but it is predicted to be met by 2050.

Table 9-4: Average Auto-Accessible Jobs per Capita (30-Minute Drive)

Geography	2019 Average Jobs per Capita	2050 Average Jobs per Capita
West Subregion	491	620
West Subregion EPCs	465	644

Equity RTO-4: EPC Job Access: Transit

Ensure That the Number of Jobs That Can Be Reached by EPC Residents with a 45-Minute Transit Trip is Equal to or Greater Than the Number of Jobs That Can Be Reached with a 45-Minute Transit Trip by All Residents in the Subregion

This metric conveys the average number of jobs per capita within a 45-minute peak period transit ride for all West County TAZs compared to all TAZs within West County EPCs. The number of jobs corresponds to those used in the travel demand model demographic inputs. As shown in Table 9-5, there are, on average, 672 jobs per West County resident and 749 jobs per West County resident within an EPC that are accessible with a 45-minute transit ride. By 2050, the averages are projected to increase to 727 and 873, respectively. This means that more jobs are already accessible via a 45-minute transit ride for EPC residents than is the case for West County residents as a whole.

This Action Plan sets a performance target for this RTO that the average number of jobs per capita within a 45-minute transit ride for EPC residents should be at least equivalent to that of the subregion. The West County subregion currently meets this target and is projected to maintain it through 2050.

Table 9-5: Average Transit-Accessible Jobs per Capita (45-Minute Ride)

Geography	2019 Average Jobs per Capita	2050 Average Jobs per Capita
West Subregion	672	727
West Subregion EPCs	749	873

Equity RTO-5: EPC Access to High-Quality Transit

Ensure That the Proportion of Urbanized EPC Land Area in the Subregion Served by High-Quality Transit is Equal to or Greater Than the Urbanized Land Area Served by High-Quality Transit in the Subregion as a Whole

As discussed in Transit RTO-4, there was a total of 28 percent of urbanized West County land within a quarter mile of a high-quality bus stop or within a half mile of a rail or ferry station. Due to disruptions with the pandemic, this figure decreased significantly to 13 percent by 2022. As shown on Figure 9-2 and in Table 9-6, West County EPC areas have a higher proportion of their land area within these high-quality transit buffers after the pandemic, but not before the pandemic. Pre-pandemic, 31 percent of West County EPCs were within the high-quality transit buffer, with only 19 percent remaining post-pandemic. Therefore, high-quality transit post-pandemic is generally more accessible in EPCs than in West County as a whole.

The Action Plan sets a performance target that the subregion should aim to maintain EPC access to high-quality transit at or above the levels that exist for West County as a whole.

Table 9-6: West County EPC Acres in Relation to High-Quality Transit

	Pre-Pandemic West County EPC Acres	Pre-Pandemic West County Proportion of Total EPC Acres	Post-Pandemic West County EPC Acres	Post-Pandemic West County Proportion of Total EPC Acres
Within high-quality transit buffer	3,476	31%	2,089	19%

All figures are for urbanized areas only.


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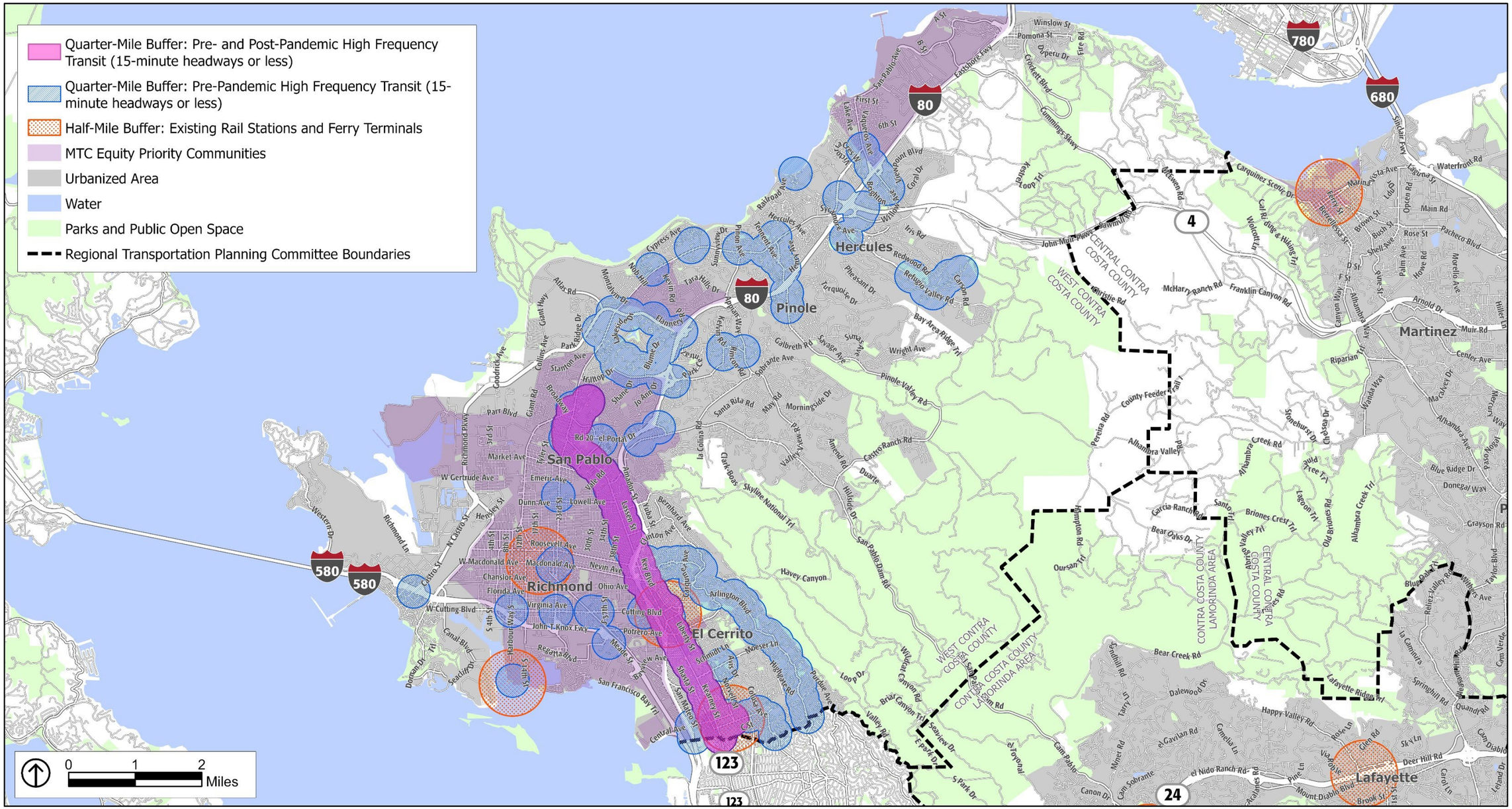
72
www.actransit.org
ONLY
ONLY
BUS

Figure 9-2: West County EPCs and High-Quality Transit



Source: CCTA, 2021; ESRI, 2021; PlaceWorks, 2022.

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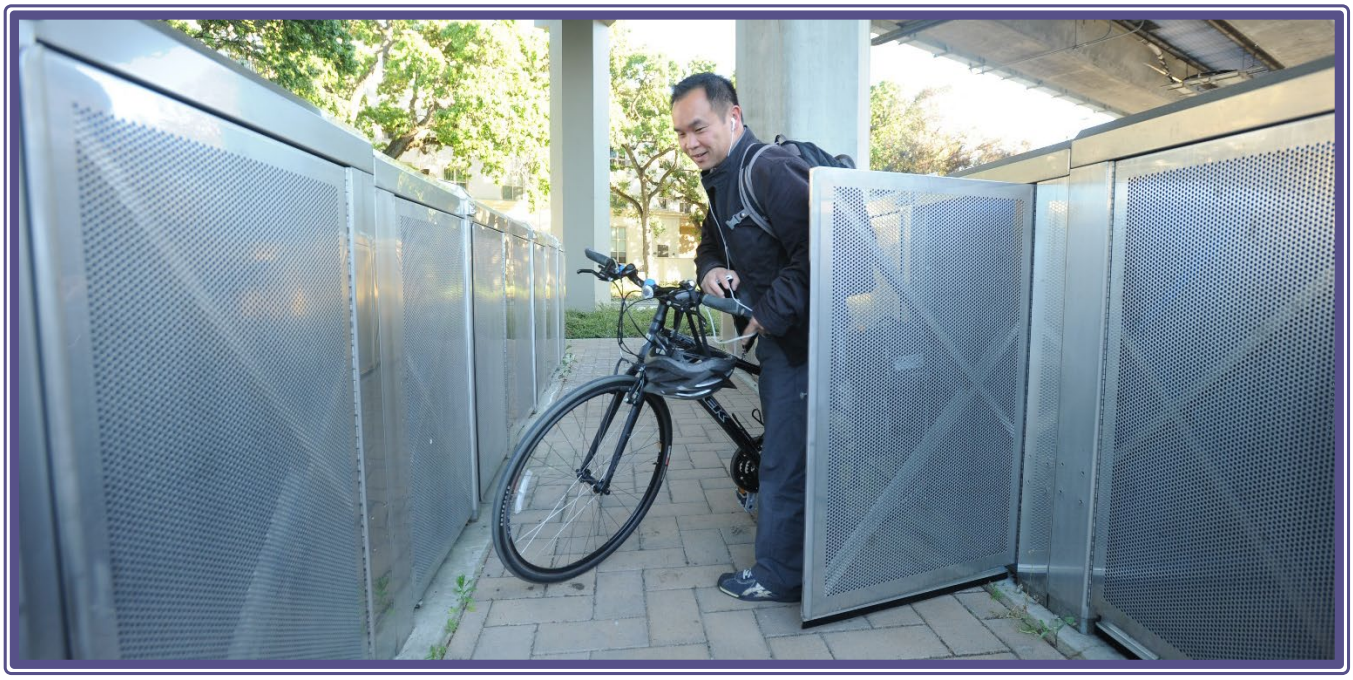
Actions

The following actions are needed to achieve the RTO targets and to implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Equity-1: Conduct a study to identify strategies to increase low-income residents' access to transit hubs, jobs, and areas with goods and services (for example, in West County, the study could explore enhancing existing transit hubs, constructing new transit hubs, and first/last mile solutions).
- Equity-2: Increase express bus service to regional job centers, particularly those with low-income workers, inside and outside of the subregion.
- Equity-3: Increase access to car-sharing services for low-income residents and support financial incentives for using them.
- Equity-4: Increase high-frequency transit lines and stops in EPC areas.
- Equity-5: Conduct a study of KSI hotspots in low-income areas to identify needed safety improvements, then implement the identified improvements.



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Chapter 10: Climate Change

As described in Chapter 2, climate change is a significant challenge facing humans and the planet, and transportation is one of the largest contributors of GHG emissions. The transportation system not only contributes to climate change, but is vulnerable to its impacts, such as extreme weather and sea level rise. This chapter includes several RTOs aimed at reducing the impact that the transportation system has on climate change and its accompanying impacts on human health. See Table 10-1 for a summary of climate change RTOs.

Table 10-1: Summary of Climate Change Regional Transportation Objectives

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Climate Change RTO-1: Single-Occupant Vehicle (SOV) Mode Share	Decrease SOV mode share per capita	None	63% for commute trips	50% for commute trips
Climate Change RTO-2: Carpool Mode Share	Increase carpool mode share	None	14% for commute trips	20% for commute trips
Climate Change RTO-3: Vehicle Miles Traveled	Decrease VMT per service population	None	22.7 VMT	21 VMT
Climate Change RTO-4: Greenhouse Gas (GHG) Emissions	Decrease GHG emissions per capita	None	15 lbs per capita	Zero transportation related
Climate Change RTO-5: Zero-Emission Vehicles	Increase registered electric vehicles	None	50% of total market share	100% of total market share

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets

RTOs

Climate Change RTO-1: SOV Mode Share

Reduce the Mode Share of SOVs in the Subregion

As shown in Table 2-2 in Chapter 2, 63 percent of total West County work trips were by SOVs, compared to 72 percent of total Contra Costa work trips. These figures are projected to slightly decrease on their own through 2050, to 62 and 70 percent, respectively.

This Action Plan sets a performance target for SOV commute mode share in the West County subregion—to match 2027 mode share at 63 percent and to decrease to 50 percent in 2050. Matching of 2027 mode share is intended to reach pre-pandemic SOV mode share, which is understood to have increased during the COVID-19 pandemic due to fears of public transportation. These numbers have been derived by reducing future SOV mode share by the targeted increases in transit, bicycle, and walk trip

mode share, and also by assuming an increase in carpooling (multiple-occupant vehicle) mode share to 20 percent by 2050.

Climate Change RTO-2: Carpool Mode Share

Increase the Mode Share of Carpooling in the Subregion

As discussed previously, reducing the SOV mode share will require increases in the other modes, including carpooling. As shown in Table 2-2 in Chapter 2, in 2019, 14 percent of total West County work trips were carpooling trips, compared to 14 percent of total Contra Costa work trips. These figures are projected to slightly increase on their own through 2050, to 16 and 15 percent, respectively. Therefore, this Action Plan sets a target of 14 percent of commute trips to be made by carpooling by 2027 to match pre-pandemic levels. This Action Plan also adopts a target of 20 percent of work trips taken by carpooling by 2050.

Climate Change RTO-3: Vehicle Miles Traveled

Reduce VMT per Service Population in the Subregion

This Action Plan considers total VMT for county and subregion residents. The 2020 VMT study conducted for CCTA by consultant Fehr & Peers found that 2018 VMT per service population in the West County subregion was 23.5, and for Contra Costa County was 30.3 VMT per service population.

The California Air Resources Board's *2017 Scoping Plan: Identified VMT Reductions and Relationship to State Climate Goals*[21] states that California needs to reduce daily per service population VMT to 21 to achieve carbon neutrality, which is the State's goal for 2045. Based on this recommendation and the finding of the Action Plan Update, this Action Plan sets a goal for 2050 to reduce VMT per service population to 21 VMT per service population in the West County area. Using a straight-line projection for reductions from 2018 until 2050, this would mean a reduction of 4 percent to 22.7 VMT per service population by 2027 (see Table 10-2).

Table 10-2: VMT per Service Population

	2018 Existing	2027 Target	2050 Target
West County	23.5	22.7	21
Contra Costa County	30.3	---	

Sources: Fehr and Peers, 2020; DKS and CCTA Travel Demand Model, 2022.

[21] California Air Resources Board, *2017 Scoping Plan: Identified VMT Reductions and Relationship to State Climate Goals*, January 2019, https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf.

Climate Change RTO-4: Greenhouse Gas Emissions

Reduce Transportation GHG Emissions per Capita in the Subregion

This metric reflects the total daily VMT occurring on roadways within the planning area, including commercial vehicle trips and through traffic, but does not include estimates of VMT occurring outside the travel demand model boundaries. The EMFAC emissions model has been used to translate this total daily roadway VMT into GHG emissions (specifically, carbon dioxide [CO_2]).[22] The emissions outputs also reflect assumptions about the future vehicle fleet.

The target for this metric is zero tons of transportation-related emissions by 2050 or about a one-third reduction in GHG per capita by 2027. With the currently estimated 23 pounds of GHG per capita, this translates to a 2027 target of about 15 pounds per capita. Although transportation-related CO_2 emissions are projected to fall by 2050 (see Table 10-3), more work is needed to reach the target of zero.

Table 10-3: Average Daily Transportation-Related GHG per Capita

	2019			2050 [a]		
	Population	CO_2 Emissions (Tons)	CO_2 Emissions Per Capita (Lbs)	Population	CO_2 Emissions (Tons)	CO_2 Emissions Per Capita (Lbs)
West County	268,649	3,038	22.62	309,913	1,927	12.43
Contra Costa County	1,148,922	13,734	23.91	1,457,615	8,737	11.99

Sources : DKS Associates; EMFAC 2021; CCTA Travel Demand Model.

a) 2050 data in this table reflect projected CO_2 emissions in 2050 assuming that the Action Plan is not implemented.

[22] California Air Resources Board, EMFAC, v1.0.2, Scenario Analysis, 2021.

Climate Change RTO-5: Zero-Emission Vehicles

Increase the Share of Zero-Emission Vehicles in the Subregion

This RTO tracks the number of battery electric vehicles "on the road," with the goal of increasing total EV market share. Data as of April 2021, the most recent report date, are shown in Table 10-4 for West County as well as all of Contra Costa County for comparison. West County currently has 4,258 EVs compared to 21,609 in the county overall.

Under a regulation approved by the California Air Resources Board, 35 percent of new passenger vehicles sold in the state must be powered by batteries or hydrogen by 2026, and 100 percent by 2035.[23] As of December 2022, 12.4 percent of new vehicles sold in California are ZEVs, and ZEVs make up about 2 percent of the light-duty vehicle fleet in Contra Costa County.

By Executive Order, California has set a target of one million ZEVs on the road by 2025 and five million ZEVs by 2030.[24] Since West County accounts for about 0.7 percent of the state's population, this suggests that the subregion should have about 6,800 ZEVs by 2025 and 34,000 ZEVs by 2030. A straight-line extrapolation of this number through 2050 suggests about 162,000 ZEVs in West County by 2050.

With all the above factors in mind, this Action Plan sets a target of 100 percent of the fleet (vehicles on the road), contrasted to the estimated existing EV fleet penetration of about two percent. The estimated number of light-duty vehicles currently based in West County is about 218,000.

Table 10-4: Electric Vehicles by Subregion as of April 2021

Area	Battery Electric Vehicles[25]	Total Vehicles	Percentage Battery Electric
Central County	4,879	247,807	2%
East County	2,926	264,910	1.1%
Lamorinda	3,141	51,896	6.1%
Tri-Valley [a]	15,262	315,590	4.8%
West County	4,258	217,792	2%
Countywide Total	**21,609**	**1,097,995**	**2.8%**

Source: California Energy Commission (2022). California Energy Commission Zero Emission Vehicle and Infrastructure Statistics. Data last updated April 2022. Retrieved June 29, 2022, from http://www.energy.ca.gov/zevstats.

Note: Correspondence of zip codes to RTPC boundaries is approximate.

a) Includes both the Contra Costa and Alameda County portions of the Tri-Valley.

[23] California Air Resources Board, Advanced Clean Cars II.

[24] Executive Order B-16-2012 and Executive Order B-48-18.

[25] A Battery Electric Vehicle is a vehicle that can operate, partially or entirely, on chemical energy stored in rechargeable battery packs.

Actions

The following actions are needed to achieve the RTO targets and to implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

511 Contra Costa

511 Contra Costa is a countywide transportation demand management program that strives to reduce traffic congestion and improve air quality through public education, resources, and tools that promote mobility options other than solitary driving. Some of its incentives and programs are Safe Routes to School, E-bicycle Rebates, Guaranteed Rides Home, and Free Bus Pass for Students. In 2021, 511 Contra Costa helped eliminate 50 million pounds of pollution by shifting drive-alone trips to transit, shared rides, bicycling, and walking.

- Climate Change-1: Work with 511 Contra Costa to expand TDM programs, adopt local TDM plans, and conduct regular monitoring and reporting for program effectiveness.
- Climate Change-2: Continue to implement a program to support deployment of high-quality, fast, and diverse EV and bus chargers in the subregion.
- Climate Change-3: Continue to promote EV ownership by offering financial incentives and providing educational programs and demonstrations.
- Climate Change-4: Work with regional agencies, local employers, and schools to increase tele-work, compressed work weeks, alternative work locations, and flex schedules, and provide pretax employer transportation benefit programs.
- Climate Change-5: Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.
- Climate Change-6: Coordinate with impacted jurisdictions, property owners, and other applicable agencies that own or maintain RRS that would be impacted by sea level rise, to coordinate and plan for inundation mitigation.
- Climate Change-7: Enable regional agencies and local jurisdictions to refer to the Adapting to Rising Tides Adaptation Roadmap when planning for sea level rise.
- Climate Change-8: Study and explore parking management and curb and policy options that would address parking minimums and maximums curbside usage.
- Climate Change-9: Adopt local policies that prioritize mobility for GHG-reducing modes of transportation.

Chapter 11: Innovation and Technology

Along with current projects and programs, technology and innovation hold promise for reducing congestion, improving air quality, and providing new mobility options for West County residents. RTOs and actions in this chapter were developed to encourage CCTA and West County jurisdictions to make use of beneficial transportation technologies. New technology can be difficult to track quantitatively, so this Action Plan only includes one Innovation and Technology RTO (see Table 11-1). However, several actions in this chapter aim to broaden the incorporation of innovation and technology in future work. Future Action Plans may include more Innovation and Technology RTOs.

Table 11-1: Summary of Innovation and Technology Regional Transportation Objective

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Innovation and Technology RTO-1: Signal Interconnection Project [a]	Increase connected signals	None	Complete Signal Interconnection Project	None

Note: Refer to the RTO discussions in this chapter for detailed information on existing conditions and explanation of the targets.

a) The CCTA Signal Interconnection Project is currently underway. Traffic signals for interconnection will be determined after publication of the Action Plan. The project is scheduled to be completed by 2027. Therefore, there are no signal interconnections proposed after 2027 unless identified later on through the project. Future interconnection may be determined in the next Action Plan update process.

RTOs

Innovation and Technology RTO-1: Signal Interconnection Project

Complete the Project to Upgrade Traffic Signals to Regional Ethernet and/or Fiber-Optic Interconnection

Traffic signal interconnection establishes a connection among individual traffic signals and a central management system, enabling remote access to the signals from a traffic management or operations center. Interconnections allow signal timings to be adjusted remotely during regular day-to-day operations, major incidents, and special events. Regional interconnection also enables cross-jurisdiction communications, coordination, and data exchange to respond to varying traffic conditions.

CCTA is currently working on a new project to identify and implement improvements to traffic signals in each subregion. CCTA will work with West County's jurisdictions to interconnect selected signals in El Cerrito, Hercules, Pinole, Richmond, and San Pablo, using funding primarily from MTC's OBAG Cycle 3 program. Since this effort is already underway, the target for this RTO is the completion of signal interconnection improvements by 2027. There is no additional target for 2050 because there are no plans for a further interconnection program.

Actions

The following actions are needed to achieve the RTO targets and to implement other goals and policies of this Action Plan, the CTP, and other regional long-range planning documents with shared priorities. For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County. All Actions are enumerated in a summary table in Appendix C, which also lists the responsible agency, partner agencies, and proposed timeline for each Action.

- Innovation and Technology-1: Promote the investigation and development of transportation-related innovations that reduce emissions and improve air quality and public health.
- Innovation and Technology-2: Interconnect the West County signal system to enable remote access to the signals from a traffic management or operations center. These signals, located on key corridors and major arterials, were identified through the Countywide Smart Signals Project based on the following prioritized criteria:
  - On RRS
  - In or providing access to a PDA, downtown, or commercial district
  - Presence of bus routes at the intersection
  - Connection to BART
  - Presence of bicycle facilities at the intersection
  - High number of bicycle and pedestrian collisions
  - Geographic distribution across Contra Costa County and the subregion
  - Connection to shared mobility hubs
  - High traffic volume
- Innovation and Technology-3: Examine the feasibility of implementing a pilot automated driving system or other modal technologies (such as an autonomous shuttle) somewhere in the West County area.
- Innovation and Technology-4: Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.
- Innovation and Technology-5: Implement micromobility recommendations from the Countywide Bicycle and Pedestrian Plan, including those related to ordinances and requests for proposals (RFPs), and work with operators to deploy micromobility systems built with industry best management practices.
- Innovation and Technology-6: Work with CCTA to determine a method for tracking the availability of EV charging stations.

- Innovation and Technology-7: Work with CCTA to mediate adoption and implementation of emerging technologies to ensure that they are feasible and do not cause adverse effects on the transportation system.
- Innovation and Technology-8: Work with BART to expand the on-demand bicycle parking program for e-bicycles and scooters at BART stations throughout Contra Costa County.
- Innovation and Technology-9: Work with CCTA and local jurisdictions to implement the CCTA EV Readiness Blueprint

Chapter 12: Financial Outlook

The Measure J GMP requires that local jurisdictions participate in a Regional Transportation Mitigation Program (RTMP) to mitigate the impact of new development on the regional and subregional transportation system. The RTMP may include fees, assessments, or other mitigations, as appropriate, to ensure that new growth pays its fair share for the transportation impacts that it generates. The RTMPs are in addition to transportation impact fees that local jurisdictions may implement on new development, as specified in each jurisdiction's local fee program. Establishment of the RTMP may include not only the transportation impacts on existing facilities, but also jobs/housing balance, carpool and vanpool programs, and proximity to transit service.

This Action Plan is not financially constrained; it includes both funded and unfunded projects and programs. The identified projects qualify for inclusion in the Authority's Comprehensive Transportation Project List, which will be revised in the 2023 CTP Update.

Subregional Transportation Mitigation Program

WCCTAC makes ongoing efforts to identify its major capital investment priorities for inclusion in local, regional, state, and federal funding plans. WCCTAC provides input to the Authority on the development of financial strategies that, if successful, result in the allocation of funds to projects in West County. West County traffic is heavily impacted by through-traffic from other regions in Contra Costa and other counties. The West County Subregional Transportation Mitigation Program (STMP) was developed with the participation and concurrence of local jurisdictions in determining the most feasible methods of mitigating regional traffic impacts.

WCCTAC's member cities (El Cerrito, Hercules, Pinole, Richmond, and San Pablo) and the County of Contra Costa have each adopted an ordinance implementing the STMP. These jurisdictions share a desire to ensure that new development in West County pays its fair share for regional circulation and transit improvements, proportional to the traffic impact the new development will generate. The local fees collected in West County provide congestion relief to mitigate traffic on RRS and through improved transit service.

Participating jurisdictions are responsible for collecting the STMP fee and forwarding it to WCCTAC. The STMP fee amounts are to be listed on each individual jurisdiction's published fee schedule. Staff from participating jurisdictions calculate the fee due based on the type and scale of the proposed project.

Local jurisdictions are required to submit a quarterly reporting form showing STMP payments whether or not STMP fees were collected during a given reporting period. The forms are due to WCCTAC no later than 30 days after the end of a quarter.

WCCTAC is empowered by its joint-powers authority and master cooperative agreement to coordinate and administer revenue for the regional transportation improvements funded with these fees. Measure J also requires that all Contra Costa County jurisdictions participate in the RTMP. If any jurisdiction fails to participate in these programs, it risks losing its annual Measure J local street maintenance and improvement funds.

Actions Related to Funding

- Financial-1: Seek new sources of funding to maintain roads, transit facilities, trails, and all associated transportation infrastructure.
- Financial-2: Continue to participate and periodically update the West County Subregional Transportation Mitigation Program to ensure it will produce sufficient funds in light of current and anticipated growth rates and construction costs.

Shared Facilities

Implementation of many of the transportation system improvements in this Action Plan will benefit multiple jurisdictions. Each of these improvements needs a negotiated agreement about cost sharing between jurisdictions. The cost-sharing approach could be based on which jurisdiction's traffic is expected to use the facility, on the boundaries within which the facility lies, or a combination. These agreements should be negotiated in advance so that when development takes place, the responsibility for improvements is clear.

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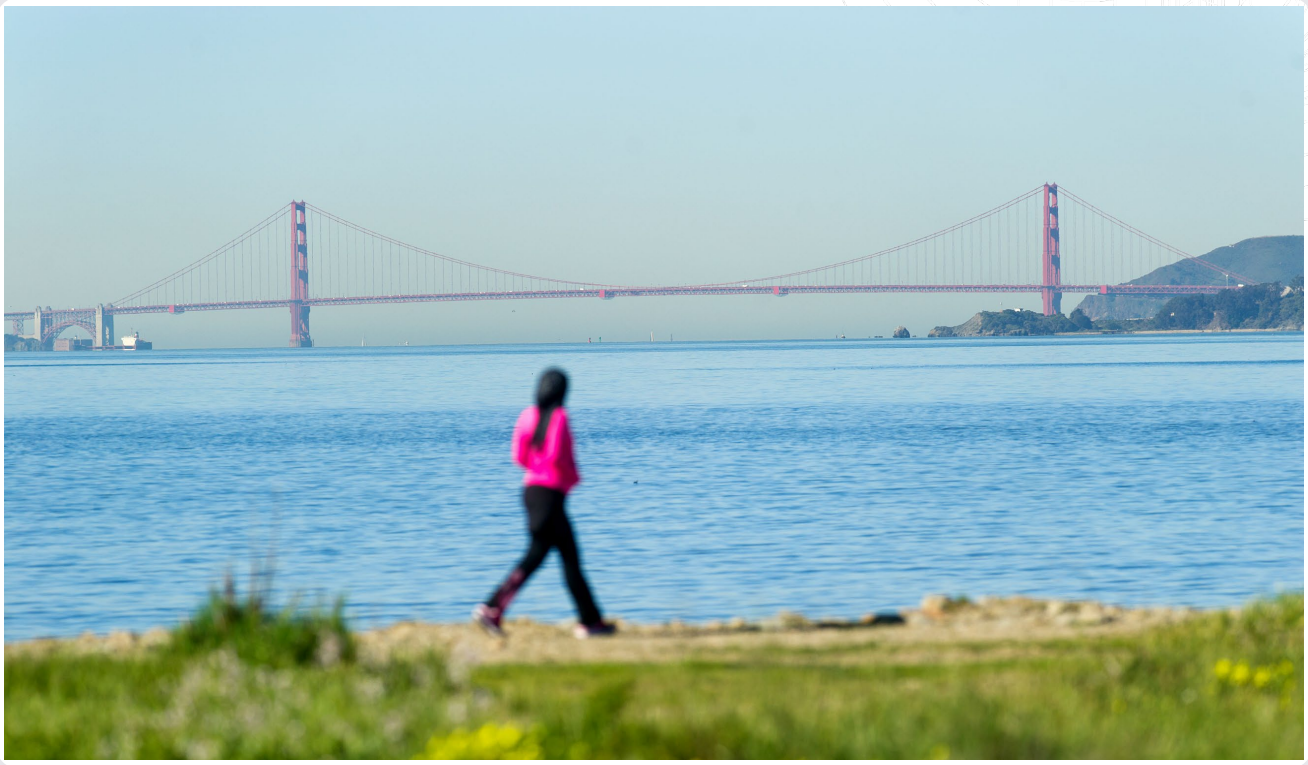
Chapter 13: Procedures for Notification, Review, and Monitoring



Action Plans are required to include a set of procedures to share environmental documents, review general plan amendments, and monitor progress in attaining the traffic service objectives. The procedures for notification, monitoring, and review are described herein.

Role of Regional Transportation Planning Committees

The RTPC for each subregion is made up of elected and appointed representatives from each jurisdiction within that subregion. Officials from transit agencies and planning commissions also serve on some of the RTPCs, either as voting or *ex officio* nonvoting members. The RTPCs are groups that engage in multijurisdictional and collaborative planning work to improve the transportation system in Contra Costa and build consensus for projects and programs over the whole subregion. Each RTPC oversees one Action Plan, except for the Southwest Area Transportation Committee, which oversees two.

In addition to their responsibilities for preparing and updating the Action Plans, the RTPCs are involved in various transportation planning efforts. The Central Contra Costa Transportation Committee, also known as Transportation Partnership and Cooperation (TRANSPAC), for example, is involved in the Innovate I-680 project and has completed improvements to the Iron Horse Trail, and WCCTAC started Richmond ferry service and completed over- and undercrossing projects along multi-use trails. In East County, TRANSPLAN continues to plan for a link to Pittsburg/Antioch BART, and in the Southwest Area, work underway includes several bicycle and pedestrian overcrossings of major thoroughfares.

Circulation of Environmental Documents and Transportation Impact Studies

The Action Plan is required to have a set of procedures to share environmental documents and transportation impact studies. This notification is to occur through the CEQA analysis process (assuming it occurs for a project) at the following two junctures: first, upon issuance of a Notice of Preparation (NOP), and second, at the stage of Notice of Completion (NOC) of the draft environmental impact report (EIR).

The Action Plan sets the threshold for circulating transportation impact studies and/or EIRs to neighboring jurisdictions, consistent with the CCTA *Implementation Guide*.[26] This threshold states that any project that generates at least 100 Net New Peak Hour Vehicle Trips (NNPHVTs) triggers preparation of a transportation impact study and notification of neighboring jurisdictions. Examples of projects that could generate more than 100 NNPHVTs are:

- A single-family residential development of more than 100 units
- A condominium development of more than 180 units
- A retail center of at least 14,000 square feet
- A general office building of at least 44,000 square feet

The following procedures are to be followed by the jurisdictions of WCCTAC regarding circulation of environmental documentation:

- For any proposed project or general plan amendment that generates more than 100 NNPHVTs during the peak hour and for which an environmental document is being prepared (Negative Declaration or EIR or Environmental Impact Statement), the lead agency shall issue a “notice of intent” to issue a negative declaration or NOP for an EIR to WCCTAC staff, all RTPC chairs or designated staff persons, and to each member jurisdiction of WCCTAC.

[26] More information on the thresholds and procedures around circulating of environmental documents and transportation impact studies can be found in Chapter 4 of the CCTA *Implementation Guide,* Evaluating the Impacts of Proposed New Development and General Plan Amendments.

- For any proposed project or general plan amendment that generates more than 100 NNPHVTs during the peak hour and for which an environmental document will not be prepared, the lead agency shall complete a transportation impact study and alert WCCTAC staff, all RTPC chairs or designated staff persons, and each member jurisdiction of WCCTAC of the study's preparation.
- WCCTAC shall notify its member jurisdictions of receipt of such notices from jurisdictions in other subregions.
- When the environmental document and/or transportation impact study described under points one and two are completed, the lead agency shall notify WCCTAC staff, all RTPC chairs or designated staff persons, and each member jurisdiction of WCCTAC.
- WCCTAC staff shall review development projects for compliance with the technical procedures regarding evaluation of new development proposals.

Note that these requirements apply to all projects generating 100 NNPHVTs or more, regardless of whether a CEQA document is prepared.[27] Further, the transportation impact study required under CCTA regulations is to cover congestion impacts and VMT, and hence will meet and exceed the requirements of CEQA, which no longer requires assessment of congestion impacts since the implementation of Senate Bill (SB) 743.

Review of General Plan Amendments

This Action Plan was developed using land use forecasts that generally reflect future land development allowed within the framework of the adopted general plans for jurisdictions in West County, and do not yet reflect additional development capacity and by-right land use modifications under state laws that became effective on January 1, 2023. General plan amendments enacted after adoption of the Action Plan could therefore adversely affect the ability to meet this Action Plan's goals, policies, and objectives.

The CCTA Implementation Guide requires that each Action Plan contain a process for notification and review of the impact of proposed General Plan Amendments (GPAs) that exceed a specified threshold size of 100 NNPHVTs.[28] Accordingly, the process outlined here has been adopted by WCCTAC. This process is also shown in more detail in the CCTA *Implementation Guide* in Chapter 4, Evaluating the Impacts of Proposed New Development and General Plan Amendments.

In addition to the project review procedures described, the following procedures are to be followed for GPAs that generate more than 100 NNPHVTs:

- Through its participation in WCCTAC, the jurisdiction preparing the GPA shall notify WCCTAC and its member jurisdictions of the proposed GPA in accordance with the above notification and circulation requirements for environmental documents and transportation impact studies.

[27] This threshold matches the CCTA *Implementation Guide* recommendation for circulation of environmental documents and transportation impact studies. Some subregions may adopt more stringent thresholds if desired.

[28] This threshold is more stringent than the CCTA *Implementation Guide* recommendation of 500 net new peak hour vehicles trips threshold for circulation of GPAs.

- Upon request by WCCTAC, the jurisdiction considering the amendment shall confer with WCCTAC staff and/or attend a meeting of either the WCCTAC and/or the WCCTAC policy board, to discuss the impacts of the proposed GPA on the adopted Action Plan. During these discussions:
  - The lead agency proposing the GPA should demonstrate that the amendment will not adversely affect the WCCTAC jurisdictions' ability to implement this Action Plan or should propose amendments to the GPA to allow this to be the case.
  - Alternatively, the lead agency proposing the GPA can propose modifications to this Action Plan for consideration by WCCTAC.

The lead agency and WCCTAC will participate in these discussions with the intent of arriving at a consensus for the proposed GPA that will not adversely affect the ability to implement this Action Plan (as it may be amended). If this does not occur, approval of the GPA by the lead jurisdiction may lead to compliance issues with the CCTA GMP.

Schedule for Action Plan Review

From time to time, this Action Plan will be reviewed in coordination with CCTA's CTP update in accordance with the CCTA GMP *Implementation Guide* for guidance on the development and updates of Action Plans.

This process will involve:

- Regular monitoring of transportation conditions on RRS and reporting to WCCTAC on RTO performance.
- Identification of RTOs not being met, which would trigger a focused revision to the Action Plan.
- A complete review of the Action Plan on a four- to five-year cycle, coordinated with updates to the CTP.
- Review of individual corridors, RTOs, and other Action Plan components as deemed appropriate by WCCTAC.

Implications for Compliance with the Measure J Growth Management Program

The CCTA *Implementation Guide* describes the conditions for GMP compliance that relate specifically to Action Plans. According to the *Implementation Guide*, each member jurisdiction must:

- Participate in the preparation and adoption of Action Plans.
- Implement actions to attain RTOs.
- Place conditions on project approvals consistent with the growth management strategy.
- Circulate environmental documents and transportation impact studies as specified in this Action Plan and consistent with CCTA policy.
- Participate in the development application and GPA review procedure.

Process for Addressing RTO Exceedances

CCTA will monitor transportation conditions in West County and all of Contra Costa County to determine whether the RTOs in this and other Action Plans are being achieved. Under adopted CCTA policy, exceedance of an RTO does not constitute a compliance issue with the GMP.

If it is determined through CCTA's monitoring program that any RTOs are not being met, CCTA will convey this information to WCCTAC for consideration in its ongoing monitoring of the Action Plan. The Implementation Guide states that if satisfactory progress is observed, then implementation of the Action Plan will continue. If progress has not been satisfactory, then the procedures for development application review and GPAs, as established in the *CCTA Implementation Guide,* shall apply. Given the level of expected growth in West County and elsewhere throughout Contra Costa and the constraints on adding new capacity to the system, it should not be surprising if some RTOs are not attained, either today or in the future. If nonattainment occurs, the only required action required is for WCCTAC to document the condition and continue to monitor and address the RTOs in future updates to the Action Plan every four to five years, as established in this chapter.

In the case where a proposed development project or GPA causes an exceedance or exacerbates a situation where an already exceeded RTO is worsened, then the procedures in this chapter regarding development application review and GPAs shall apply.

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Appendix A:

Summary of RTOs and Targets

Appendix A: Summary of RTOs and Targets

Table A-1: Summary of RTOs and Targets

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Transit RTO-1: Transit Mode Share	Increase mode share of transit trips	None	21% commute trips 7% of all trips	25% of commute trips 10% of all trips
Transit RTO-2: Mode Share to/from BART	Increase mode share of people accessing BART with non-vehicle modes	None	46%	56%
Transit RTO-3: Transit Trip Time	Optimize travel time on transit for key corridors	None	Transit time ≤ auto travel time	Transit time ≤ auto travel time
Transit RTO-4: High-Quality Transit Access	Increase urbanized land area served by high-quality transit	None	28%	40%
Transit RTO-5: Paratransit and Community-Based Transportation Program Access	Increase rides through paratransit and Community-Based Transportation programs	None	Increase by 5%	Increase by 20%
Active Transportation RTO-1: Active Transportation Mode Share	Increase active transportation mode share	None	7% all trips [a] 2% commute trips	11% all trips 5% for commute trips
Active Transportation RTO-2: Low-Stress Bicycle Network	Increase contiguity and completeness of the LSBN	None	61%	90%

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Active Transportation RTO-3: Unprotected Trail Crossings	Eliminate unprotected crossings of the LSBN intersections with roadways	None	No unprotected crossings	No unprotected or semi-protected crossings
Roadways RTO-1: Freeway Delay Index	Maintain current delay index	I-580: 2.5 or less I-80: 3.0 or less SR-4: 2.0 or less	I-580: 2.5 or less I-80: 3.5 or less SR-4: 2.0 or less	I-580: 2.5 or less I-80: 3.5 or less SR-4: 2.0 or less
Roadways RTO-2: Freeway Buffer Index	Maintain current buffer index	None	0.5	0.5
Roadways RTO-3: Intersection Level of Service (LOS)	Maintain LOS at RTO monitoring locations	LOS D LOS E on San Pablo Avenue and San Pablo Dam Road	LOS D In all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or Transit Priority Areas (TPAs)	LOS D In all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or TPAs
Roadways RTO-4: Roadway Segment LOS	Maintain LOS on two-lane roadways outside of urban areas	None	LOS E (≤40 miles per hour)	LOS E (≤40 miles per hour)
Safety RTO-1: KSI Collisions	Eliminate collisions that result in fatality or severe injury	None	Zero fatality and severe injury collisions [b]	
Safety RTO-2: Active Transportation Collisions	Eliminate collisions involving users of active transportation	None		
Safety RTO-3: Active Transportation Collisions near Schools [c]	Eliminate active transportation-involved collisions occurring within 500 feet of schools	None		

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Equity RTO-1: EPC Low-Stress Bicycle Network	Proportion of the LSBN that is complete in East County EPCs, as compared to East County as a whole	None	Increase level of LSBN completion to match or exceed that of West County as a whole	
Equity RTO-2: Collisions in EPCs	Proportion of KSI collisions that occur in EPCs, as compared to East County as a whole	None	Decrease collision rates to match West County as a whole	
Equity RTO-3: EPC Job Access: Driving	Share of jobs accessible by EPC residents with a 30-minute drive, as compared to East County as a whole	None	Increase job access to match West County as a whole	
Equity RTO-4: EPC Job Access: Transit	Share of jobs accessible by EPC residents with a 45-minute transit trip, as compared to East County as a whole	None	Maintain existing job access to match or exceed that of West County as a whole	
Equity RTO-5: EPC Access to High-Quality Transit	Total number of EPC acres within a high-quality transit buffer, as compared to East County as a whole	None	Maintain access to high-quality transit to match or exceed that of West County as a whole	
Climate Change RTO-1: Single-Occupant Vehicle (SOV) Mode Share	Decrease SOV mode share per capita	None	63% for commute trips	50% for commute trips
Climate Change RTO-2: Carpool Mode Share	Increase carpool mode share	None	14% for commute trips	20% for commute trips
Climate Change RTO-3: Vehicle Miles Traveled	Decrease VMT per service population	None	22.7 VMT	21 VMT

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Climate Change RTO-4: Greenhouse Gas (GHG) Emissions	Decrease GHG emissions per capita	None	15 lbs per capita	Zero transportation related
Climate Change RTO-5: Zero-Emission Vehicles	Increase registered electric vehicles	None	50% of total market share	100% of total market share
Innovation and Technology RTO-1: Signal Interconnection Project	Increase connected signals	None	Complete Signal Interconnection Project	None

a) *"All trips" refers to all trips with an origin or destination in West County.*

b) *CCTA codified Vision Zero work through Resolution 21-40-G, which adopts the Contra Costa Countywide Transportation Safety Policy and Implementation Guide for Local Agencies.*

c) *Schools in this analysis refer to all public and private grade K-12 schools.*

Appendix B

RTOs Considered but not Recommended for Adoption in this Action Plan

Appendix B: RTOs Considered but not Recommended for Adoption in this Action Plan

Throughout the Action Plan update, several objectives were considered and evaluated but ultimately not carried forward into this Action Plan update. These potential metrics and RTOs were found by CCTA and its consultants to be difficult to quantify and track in the Action Plan due to lack of available data. Should new data become available, they could potentially be tracked and added in future updates.

- **Wait time for paratransit.** CCTA and the RTPC transportation advisory committees (TAC) were interested in tracking wait time for paratransit to expand from the work in CCTA's Accessible Transportation Strategic Plan. The topic was not recommended for this Action Plan because paratransit scheduling and function are not conducive to such a metric. This Action Plan uses a different paratransit metric in Chapter 5, Transit, and includes actions that support implementation of the strategic plan.
- **Bicycle ownership.** The intent of a bicycle or e-bicycle ownership RTO would be to understand the proportion of a subregion's population that owns devices and therefore understands the availability of active transportation such as bicycling. However, there are no data sources that track the number of existing bicycles or e-bicycles or their ownership status, and there is no mechanism in place to track this moving forward.
- **Number of shared scooters, shared bicycles, and public autonomous vehicles that are deployed.** As of publication of this Action Plan, there is only one subarea in all of Contra Costa County with an active micromobility program and only one other subarea currently pursuing deployment of its own. CCTA and its consultants agreed that the most efficient way to incorporate shared mobility is to first support CCTA in a regional leadership role, similar to what the Transportation Authority of Marin and the Sonoma County Transportation Authority have done. This role could include working with operators and jurisdictions to create a draft ordinance and/or Request for Proposals (RFPs) or a set of model standards for the local jurisdictions to adopt locally.
- **Pavement condition on the countywide Low-Stress Bicycle Network.** No programs currently track pavement condition on the entire countywide LSBN. Pavement condition is currently tracked in a few areas of the county, but such tracking is for roadway segments used for vehicles only and does not include the portions of roadways used for walking or bicycling. Further, data on pavement condition, such as tracked by East Bay Regional Parks, do not reflect true pavement conditions because they do not account for conditions resulting from tree uprooting, settling, or damage.
- **Use of shared (pooled) Transportation Network Companies.** Data assembled before the pandemic showed that Transportation Network Companies (TNC), such as Lyft and Uber, led to increases in VMT and congestion. However, shared TNC rides (or "pooled rides"), in which several unrelated riders share a vehicle for a trip, could reduce VMT and congestion. For this reason,

shared TNC rides were used as a metric in the Action Plan. However, the pandemic led to the cancellation of shared services by both Lyft and Uber in the greater Bay Area, so it is impossible to track such rides today. Moreover, data from Lyft and Uber are difficult to obtain.

- **Average commute time for low-income residents versus higher-income residents.** The Action Plan team was interested to know if there is a correlation between the time that commuters spend traveling to and from work and their income. Specifically, RTPC TAC members were curious to know if low-income commuters spend a disproportionately longer time traveling to work than higher-income commuters. Based on American Community Survey data, the project team found that the correlation value between income and commute time was 0.3 in 2019, indicating a weak correlation.
- **Miles of RRS estimated to be vulnerable to sea level rise.** The Action Plan team identified all key facilities subject to inundation through sea level rise, which were limited to bay shore areas in West, Central, and East County. Through this exercise, the project team determined that the majority of RRS or other infrastructure are in areas where private property owners and entities, such as Union Pacific Railroad, will likely work with local agencies to protect their infrastructure, thereby reducing the need for local intervention. In cases where local intervention or action would need to occur, sea level rise adaptation planning will occur incrementally over time and is likely already being considered, such as through the current update to the Contra Costa County General Plan and Climate Action Plan and regional work through agencies such as the Association of Bay Area Governments and State working groups. Furthermore, it is difficult to know the true extent of infrastructure impacted by sea level rise due to elevation of existing roadways (which may not be at sea level, such as the Carquinez Bridge) and unknowns related to vital infrastructure along these routes that may not be identified, such as bus storage lots or utility boxes.
- **Percentage of vulnerable RRSs for which remediation plans or a mitigation approach have been created.** Since the project team does not propose moving forward with the previous RTO, we recommend not moving forward with this RTO.
- **Speed reduction.** CCTA's Vision Zero effort includes speed reduction as a defined goal. The CCTA Vision Zero Implementation Guide for Local Jurisdictions points to encouraging safe speeds as a key priority. Mobile device data can be used to measure existing prevailing speeds on specific roadways; however, this mobile device data can be difficult to gather, especially in a large geographic area.
- **Electric vehicle chargers.** The Action Plan team and several RTPC TAC members questioned the inclusion of an RTO tracking the number of EV charging stations. The project team pursued such an RTO and found that several data obstacles presented an issue to accurately reporting the number of EV charging stations. Some limitations include, but are not limited to, certain brand EV chargers being exclusive to specific EV models, lack of accurate reporting, chargers advertised as public chargers being inaccessible behind various barriers, such as parking garages or private gates, and general uncertainty around the number of EV charging stations that exist in single- and multifamily homes. Therefore, this RTO has not been included in the Action Plan. However, this Action Plan does include Action Innovation and Technology-6: Work with CCTA to determine a method for tracking the availability of EV charging stations. The intention of this Action is to ensure that there be an accurate way to track the number of EV charging stations in the West County subregion in the coming years.

Appendix C:

Summary of Actions

Appendix C: Summary of Actions

Actions are contained in Chapters 5 through 11 of this Action Plan. This appendix repeats all actions from those chapters for ease of reference on a single list of actions, in Table C-1.

As noted in the Introduction chapter, this Action Plan constitutes a work program for WCCTAC, CCTA, and its member agencies, with some actions to be completed by outside agencies, such as Caltrans and BART. For each action, a "Lead Agency" is listed, which indicates the agency that should take the lead in implementing the action. Additional "Partner Agencies" are also listed, who may provide staff support or financing, or who may have to adopt or implement parts of the action after the Lead Agency initiates it. In some cases, a Lead or Partner Agency assigned to an action may change over time as need arises. Further, in some cases, a Lead Agency listed in Appendix C-1 may not be responsible for every component of an Action, such as funding. In these cases, the Lead Agency can work with CCTA and WCCTAC to determine the appropriate party for certain components of an Action.

For Contra Costa jurisdictions, requirements for compliance with the GMP are provided in the CCTA *Implementation Guide*, which specifies that Contra Costa jurisdictions have an obligation to implement Actions consistent with the time frame of the Action Plans. Compliance with this requirement will be evaluated by CCTA every other year, based on a Compliance Reporting Checklist submitted by the subregion's incorporated cities and unincorporated portions of western Contra Costa County.

Each Action has a "timeframe," which indicates when the Action is expected to occur. The timeframes listed are:

- Near-Term: To be completed within two years from the time of Action Plan adoption.
- Mid-Term: To be completed within five years from the time of Action Plan adoption.
- Long-Term: To be completed within 10 years from the time of Action Plan adoption.
- Ongoing: To be initiated immediately upon Action Plan adoption and to be continued on an ongoing basis

Table C-1: Summary of Action and Applicable Detail

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 5, TRANSIT			
▫ **Transit-1:** Work with local transit providers and regional funding agencies to identify funding for improvements for mobility (e.g., via bus) service in West County, including operations and maintenance and supporting infrastructure, such as bus yards.	WCCTAC	West County Transit Provider Responsible West County Member Jurisdictions	mid-term
▫ **Transit-2:** Pursue plans, programs, and projects that incorporate pedestrian and bicycling access into transit-oriented development.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Transit-3:** Work with CCTA to develop new or expanded mobility hubs along major activity centers and along freeways and other important corridors and work with partners to address issues related to ownership, acquisition, and oversight of operations and maintenance.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators	mid-term
▫ **Transit-4:** Work with the Water Emergency Transportation Authority (WETA), CCTA, and other partners to ensure ongoing operations of Richmond Ferry Service.	CCTA	WCCTAC WETA	mid-term
▫ **Transit-5:** Work with passenger rail operators in countywide and regional efforts to implement passenger rail improvements in West County, such as providing higher frequency of service on the Capitol Corridor and San Joaquin Altamont Corridor Express (ACE) Corridor, and planning for the Link 21 program.	CCTA	WCCTAC Amtrak Capitol Corridor ACE BART	long-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-6:** Pursue projects and programs that improve the passenger experience, such as upgrade systems, modernize stations, and expand the passenger capacity of BART stations.	CCTA	WCCTAC BART West County Transit Providers	long-term
▫ **Transit-7**: Improve the reliability, efficiency, frequency, and travel time of transit (e.g., bus) service along RRS, especially on San Pablo Avenue.	CCTA	WCCTAC BART West County Transit Providers	mid-term
▫ **Transit-8:** Continue to work with CCTA and local jurisdictions to improve circulation and multimodal access near BART stations.	CCTA	Responsible West County Member Jurisdictions	mid-term
▫ **Transit-9:** Implement the recommendations of the Contra Costa Accessible Transportation Strategic Plan, including the establishment of a new coordinating entity and a new, ongoing, and dedicated funding source.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators West County Paratransit providers	near-term
▫ **Transit-10:** Implement plans and support ongoing plans that promote regional express buses and enhance bus rapid transit along transit corridors and RRS.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators	near-term
▫ **Transit-11:** Continue to consider the prospects for a public transportation link between the Richmond Station to Contra Costa College in San Pablo and Hilltop in Richmond, with an awareness of the evaluation criteria in BART's system expansion policy.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators	near-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-12:** Plan and implement enhanced railroad crossings to improve the safety of pedestrian and bicycle access and to reduce noise and quality-of-life impacts throughout West County; enhancements may involve implementing quiet zones, grade separations, train-traffic signal preemption systems, or other measures.	CCTA	WCCTAC BART Responsible West County Member Jurisdictions Capitol Corridor Amtrak	ongoing
▫ **Transit-13:** Work with the City of Hercules to ensure ongoing operations of the Hercules Hub.	CCTA	City of Hercules West County Transit Providers	ongoing
▫ **Transit-14:** Work with local jurisdictions to study and fund options for improving curb management and commercial and public bus, truck, and van passenger loading on key public streets.	CCTA	Responsible West County Member Jurisdictions	near-term
▫ **Transit-15:** Participate in current and future studies regarding rail options for the West County area and continue exploring development of new rail stations.	CCTA	WCCTAC BART Responsible West County Member Jurisdictions Capitol Corridor Amtrak	ongoing

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-16:** Work with CCTA, local jurisdictions, and local public transit operators to: • Link transit service within the West County subregion, more directly to communities outside the West County subregion, between BART stations, and between adjacent counties. • Leverage MTC's effort to standardize operations, regional mapping, and wayfinding. • Implement traffic signal management and bus prioritization technology on transit RRS routes to improve bus speed and reliability. • Implement the recommendations identified in the Integrated Transit Study.	WCCTAC	CCTA Responsible West County Member Jurisdictions West County bus operators BART	ongoing
▫ **Transit-17:** Evaluate systemwide bus stop improvements; make it safer and easier for people to access transit stations; and ensure that transit, and its related pedestrian access and connectivity, is safe and attractive.	WCCTAC	CCTA Responsible West County Member Jurisdictions West County transit operators	mid-term
▫ **Transit-18:** Provide educational awareness of public transportation options through outreach, education, incentive and support programs, and advertising, particularly in local schools.	511CC	WCCTAC Responsible West County Member Jurisdictions West County transit operators	ongoing
▫ **Transit-19**: Work with CCTA and local transit operators to explore financial incentives and reduced fares for public transportation, including a feasibility study to explore a subregional or countywide Universal Basic Mobility program.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators MTC	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-20:** Work with CCTA and MTC to promote Safe Routes to Transit projects and programs, and submit applications for funding for construction of local Safe Routes to Transit projects and programs.	511CC	WCCTAC MTC Responsible West County Member Jurisdictions West County transit operators	ongoing
▫ **Transit-21:** Work with local jurisdictions and transit service providers to reinstate halted neighborhood bus lines where demand exists so it is at or beyond pre-pandemic levels.	Responsible West County transit operators	CCTA Responsible West County Member Jurisdictions	near-term
▫ **Transit-22:** Adopt local policies that prioritize safety for the most vulnerable users at all stages of project planning and delivery.	Responsible West County Member Jurisdictions	CCTA West County Transit Operators	near-term
▫ **Transit-23:** Work with CCTA and local transit providers to ensure real-time online transit information for all routes.	Responsible West County transit operators	CCTA Responsible West County Member Jurisdictions	mid-term
▫ **Transit-24:** Explore designating transit as the primary mode on San Pablo Avenue.	Responsible West County Member Jurisdictions	CCTA WCCTAC West County transit operators	near-term
▫ **Transit-25:** Assist local jurisdictions in the development of design guidelines and objective design standards to support transit-oriented development in downtowns, priority development areas, transit priority areas, and other areas well-served by transit.	CCTA	MTC WCCTAC Responsible West County Member Jurisdictions West County transit operators	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-26:** Work with CCTA and transit providers to identify and prioritize a network of transit corridors for transit signal priority, part-time transit lanes, transit-only lanes, and other transit-focused improvements.	CCTA	WCCTAC Responsible West County Member Jurisdictions West County transit operators	long-term
▫ **Transit-27:** Develop actions that would reduce the differential between auto travel times and transit travel times during off-peak periods.	WCCTAC	Responsible West County Member Jurisdictions West County transit operators	mid-term
▫ **Transit-28**: Work with CCTA, WCCTAC, local jurisdictions, and partner agencies to study how to reinstate transit service post-pandemic and to influence both commute and non-commute travel behavior.	CCTA	Responsible West County Member Jurisdictions West County transit operators	mid-term
▫ **Transit-29:** Work with CCTA and the future accessible transportation Coordinating Entity to explore additional RTOs related to accessible transportation for inclusion in the next Action Plan update.	CCTA	Responsible West County Member Jurisdictions West County transit operators	mid-term
▫ **Transit-30:** Work with CCTA and local transit providers to reinstate high-quality transit that operated in the subregion prior to the pandemic.	CCTA	Responsible West County Member Jurisdictions West County transit operators	mid-term

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 6, ACTIVE TRANSPORTATION			
▫ **Active Transportation-1:** Work with local and regional jurisdictions to update, adopt and implement bicycle and pedestrian plans to expand and/or improve facilities to ensure a seamless, safe, and contiguous active transportation network that provides a positive user experience for people traveling for the daily-average distance/duration trip.	Responsible West County Member Jurisdictions	CCTA	ongoing
▫ **Active Transportation-2:** Require land-use development project scopes to include any change-of-use, to provide lockers and secure short-term bicycle parking and long-term storage options at appropriate locations, and seek funding first at key activity centers throughout West County.	Responsible West County Member Jurisdictions	CCTA	ongoing
▫ **Active Transportation-3:** Improve people access and safety, including micromobility, bicyclists, and pedestrians, through and near highway interchange areas. Reduce the maximum potential vehicle speeds, by using the Vision Zero Toolbox and Safe System Approach.	CCTA	Responsible West County Member Jurisdictions	ongoing
▫ **Active Transportation-4:** Conduct a planning and engineering/design feasibility study along Richmond Parkway to reduce impacts from development; manage and balance truck traffic in mixed-flow travel lanes; and overall, recommend bicycle and pedestrian improvements to close gaps and improve safety and connectivity to the Richmond-San Rafael Bridge Bay Trail.	CCTA	WCCTAC Responsible West County Member Jurisdictions	near-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-5:** Construct gap closure projects in the countywide low-stress bicycle facilities network to establish a safe and contiguous network.[29]	Responsible West County Member Jurisdictions	CCTA WCCTAC East Bay Regional Park District	mid-term
▫ **Active Transportation-6:** Develop local bicycle facilities network links to the regional San Francisco Bay Trail and Richmond and Ohlone Greenways to facilitate contiguous longer-distance bicycle travel through West County and to/from neighboring regions.	CCTA	WCCTAC East Bay Regional Park District Responsible West County Member Jurisdictions	near-term
▫ **Active Transportation-7:** Develop a program to bi-annually provide funds for implementation of the Complete Streets policies of the regional and local jurisdictions.	CCTA	WCCTAC Responsible West County Member Jurisdictions	near-term
▫ **Active Transportation-8:** Implement the recommendations from the Appian Way Alternatives Analysis and Complete Streets Study.	Responsible West County Member Jurisdictions	CCTA WCCTAC	near-term
▫ **Active Transportation-9:** Implement recommendations from and update the findings of the countywide Safe Routes to School needs assessment and seek funding for bicycle and pedestrian improvements in West County school areas.	Responsible West County Member Jurisdictions	CCTA WCCTAC	near-term

[29] Refer to Chapter 6, Active Transportation, for more information on gap closures and specific segments.

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-10:** Work with CCTA, Contra Costa Health Services, and Street Smarts Diablo Region to facilitate a countywide coordinated approach to Safe Routes to Schools programs, and to identify continuous multi-year funding sources to encourage students, employees, visitors, and residents at private and public K-12 schools, technical schools, and college sites to use non-vehicle modes to get to/from school.	CCTA	WCCTAC Contra Costa Health Services Street Smarts Diablo School Districts Responsible West County Member Jurisdictions	ongoing
▫ **Active Transportation-11:** Work with local jurisdictions to promote 511 Contra Costa's active transportation programs that increase awareness of multimodal travel options, travel behavior incentives, and safety through outreach, events, education, social media, marketing, and advertising.	511CC	CCTA WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Active Transportation-12:** Continue programs that reduce the cost of using electric bicycles and pursue new programs to reduce the cost of conventional (pedal) bicycle use for Contra Costa residents.	511CC	WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Active Transportation-13:** Work with CCTA, the East Bay Regional Park District, and other partner agencies to develop a method of tracking the Pavement Condition Index (PCI) of bicycle facility segments along the low-stress bicycle network, and implement rehabilitation, repair, and replacement modifications where and as needed.	CCTA	East Bay Regional Park District Responsible West County Member Jurisdictions	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-14:** Construct bicycle and pedestrian crossing improvements at intersections where the LSBN has an unprotected or semi-protected crossing of a heavily traveled vehicle route.[30]	Responsible West County Member Jurisdictions	CCTA East Bay Regional Park District	long-term
▫ **Active Transportation-15:** Work with CCTA to conduct, update, and implement a comprehensive countywide Pedestrian Needs Assessment.	CCTA	Responsible West County Member Jurisdictions	near-term
▫ **Active Transportation-16:** Work with CCTA and local jurisdictions to explore installation of e-bicycle charging infrastructure in publicly accessible and convenient places, including trails, shared mobility hubs, existing and planned EV charging locations, and near commercial/retail establishments.	CCTA	WCCTAC Responsible West County Member Jurisdictions East Bay Regional Parks District	mid-term
▫ **Active Transportation-17:** Develop a planned alignment and secure land tenure as needed to realign the Bay Trail route between Hensley Street and Gertrude Avenue to the western side of Castro Street and the Richmond Parkway.	CCTA	WCCTAC Responsible West County Member Jurisdictions East Bay Regional Parks District	mid-term
▫ **Active Transportation-18:** Work with CCTA on an ongoing basis to update the LSBN adopted in the 2018 Countywide Bicycle and Pedestrian Plan.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term

[30] Refer to Chapter 6, Active Transportation, for more information on bicycle and pedestrian crossings with heavily traveled roadways and specific locations that need improvements.

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 7, ROADWAYS			
▫ **Roadways-1:** Complete necessary operational improvements (e.g., protected turn lanes, synchronized signal timing, auxiliary lanes) on freeways, at intersections and on roadway segments that are needed to maintain the RTOs in this Action Plan, while balancing these improvements against the objectives and actions regarding other modes and issues covered by this Action Plan.	Caltrans (for freeways) Responsible West County Member Jurisdictions (for surface roadways)	CCTA WCCTAC	ongoing
▫ **Roadways-2:** Complete the reconstruction of the I-80/San Pablo Dam Road interchange.	CCTA	WCCTAC Responsible West County Member Jurisdictions Caltrans	mid-term
▫ **Roadways-3:** Complete the improvements associated with the I-80/Central Avenue interchange.	CCTA	WCCTAC Responsible West County Member Jurisdictions Caltrans	mid-term
▫ **Roadways-4:** Implement transit priority improvements in the West County service area and continue to work with Caltrans on refinement and monitoring of the Integrated Corridor Management (ICM) program.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions West County Transit Providers	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Roadways-5:** Reconstruct part or all of the SR-4 and I-80 interchange to improve transit access to the Hercules Transit Center, and work with local jurisdictions to identify any other ramp reconfiguring projects.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-6:** Implement the recommended actions in WCCTAC's I-80 Corridor System Management Plan.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-7:** Work with CCTA to complete a countywide goods movement plan that promotes greater use of technology for communications and scheduling, funding for equipment upgrades for air quality improvements with cleaner technology, and an advocacy platform for goods movement and guidance for local jurisdictions.	CCTA	WCCTAC West County Transit operators Responsible West County Member Jurisdictions	short-term
▫ **Roadways-8:** Improve the operational efficiency of freeways and arterial streets through effective corridor management strategies, such as ramp metering, traffic operations systems, Intelligent Transportation Systems improvements, HOV/HOT lane and bypass lanes, and others to support a cohesive transportation system for all modes.	Caltrans	CCTA WCCTAC Responsible West County Member Jurisdictions MTC	ongoing
▫ **Roadways-9:** Work with CCTA, Caltrans, California Highway Patrol, and local jurisdictions to continue studying the feasibility of pilot and long-term programs for bus on shoulder, which may include examining legislation that should change.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Roadways-10:** Work with CCTA, Caltrans, and California Highway Patrol to develop a program to track HOV/HOT and toll lane violators.	CCTA	Caltrans MTC California Highway Patrol Responsible West County Member Jurisdictions	near-term
▫ **Roadways-11:** Work with CCTA and local jurisdictions to develop a program to discourage diversion from freeways and cut-through travel on surface roadways by developing traffic management programs, increasing trip capacity on freeways, completing freeway operational improvements, implementing traffic-calming measures on surface roadways, and exploring surface roadway redesign to support active and public transit modes.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-12:** Develop a program to establish, operate, and maintain existing and additional public or private park-and-ride facilities at appropriate locations, including shared-use agreements at activity centers with underutilized parking spaces.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-13:** Participate in evaluations of West County freeways that may involve proposed changes to managed lanes, such as HOV lane modifications, special-purposes lanes, or HOT/Express Lanes.	CCTA	WCCTAC Caltrans Responsible West County Member Jurisdictions	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Roadways-14:** Maintain pavement management systems and schedules, and continue to seek additional funding for local roadway maintenance.	CCTA	WCCTAC MTC Responsible West County Member Jurisdictions	ongoing
▫ **Roadways-15:** Conduct a study to consider modifications to 23rd Street to convert it to a balanced multimodal corridor that emphasizes transit and active transportation over vehicles, building on the concepts that are already in the City of San Pablo's 23rd Street Specific Plan and the Richmond Bay Specific Plan	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-16:** Work with WCCTAC, local jurisdictions, and CCTA to seek funding to implement recommendations of the North Richmond Truck Route Study (or other mutually agreed-upon implementation measures) to improve connectivity to designated truck routes, discourage nonlocal heavy truck traffic on local streets, and improve public health and safety in West County communities.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-17:** Explore options to extend the truck-climbing lane on Cummings Skyway and to implement a Class II bicycle lane on Cummings Skyway between San Pablo Avenue and Franklin Canyon Road.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Roadways-18:** Participate in the San Pablo Avenue Multimodal Corridor Study with the goal of enhancing the street as a multimodal corridor and implement the recommendations from the study once it is approved.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Roadways-19:** Develop one or more subregional corridor plans for key streets such as 23rd Street and Richmond Parkway to provide adequate roadway capacity for local and subregional travel while also including both public transit and active transportation modes and nonmodal transportation issues such as equity, climate change, safety, and technology.	CCTA	WCCTAC Responsible West County Member Jurisdictions	near-term
▫ **Roadways-20:** As part of the CTP process, study roadway improvements along key RRS, to include roadway cross sections showing changes to lane configurations, sidewalks, bicycle facilities, shoulders, and other roadway components.	CCTA	WCCTAC Responsible West County Member Jurisdictions	near-term
▫ **Roadways-21:** Work with relevant partner agencies to conduct long term West County emergency evacuation planning studies which will include, but are not limited to, traffic signal upgrades necessary for evacuation counterflow signal operations.	RTPC	CCTA Caltrans Responsible West County Member Jurisdictions	long-term
CHAPTER 8, SAFETY			
▫ **Safety-1:** Work with regional and local agencies, including Contra Costa Health Services/Contra Costa Public Health, to increase the level of multimodal public awareness about bicycle and pedestrian safety and to reduce and prevent injuries due to vehicle-involved collisions.	CCTA	Costa Health services/Contra Costa Public Health Responsible West County Member Jurisdictions	near-term
▫ **Safety-2:** Work with CCTA to develop a program to coordinate the collection and analysis of safety data, identify areas of concern where concentrations of collisions occur, and propose safety-related	CCTA	511 Contra Costa Responsible West County Member Jurisdictions	mid-term

Action	Lead Agency	Partner Agency	Timeline
improvements and user awareness to support state and federal safety programs and performance measures.			
▫ **Safety-3:** Work with CCTA, California Highway Patrol, and Caltrans to prepare an incident management plan for West County freeways.	CCTA	WCCTAC Caltrans California Highway Patrol Responsible West County Member Jurisdictions	mid-term
▫ **Safety-4:** Work with CCTA to implement the Countywide Vision Zero Framework and Safe System Approach to project scoping and delivery.	CCTA	Responsible West County Member Jurisdictions	ongoing
▫ **Safety-5:** Conduct a study, led by WCCTAC, to identify all safety-related transportation improvements needed within 500 feet of schools.	CCTA	WCCTAC Responsible West County Member Jurisdictions 511CC	mid-term
▫ **Safety-6:** Work with CCTA, MTC, and East Bay Regional Parks District (EBRPD) to study and mitigate the safety impacts of electric bicycles and other micromobility devices on local trails and streets, with the aim of eventually allowing electric bicycles, e-scooters, and other micromobility devices on all of these facilities.	CCTA	WCCTAC MTC East Bay Regional Parks District Responsible West County Member Jurisdictions	short-term
▫ **Safety-7:** Improve the safety of high-incident local roadways through physical changes, signage, technology, education, enforcement, or other tools.	CCTA	WCCTAC Responsible West County Member Jurisdictions	ongoing

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 9, EQUITY			
▫ **Equity-1:** Conduct a study to identify strategies to increase low-income residents' access to transit hubs, jobs, and areas with goods and services (for example, in West County, the study could explore enhancing existing transit hubs, constructing new transit hubs, and first/last mile solutions).	CCTA	WCCTAC West County transit operators Responsible West County Member Jurisdictions	short-term
▫ **Equity-2:** Increase express bus service to regional job centers, particularly those with low-income workers, inside and outside of the subregion.	West County Transit operators	CCTA WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Equity-3:** Increase access to car-sharing services for low-income residents and support financial incentives for using them.	CCTA	WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Equity-4:** Increase high-frequency transit lines and stops in EPC areas.	West County transit operators	CCTA WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Equity-5:** Conduct a study of KSI hotspots in low-income areas to identify needed safety improvements, then implement the identified improvements.	CCTA	WCCTAC Responsible West County Member Jurisdictions	short-term

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 10, CLIMATE CHANGE			
▫ **Climate Change-1:** Work with 511 Contra Costa to expand TDM programs, adopt local TDM plans, and conduct regular monitoring and reporting for program effectiveness.	511CC	CCTA WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Climate Change-2:** Continue to implement a program to support deployment of high-quality, fast, and diverse EV and bus chargers in the subregion.	CCTA	WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Climate Change-3:** Continue to promote EV ownership by offering financial incentives and providing educational programs and demonstrations.	CCTA	WCCTAC Responsible West County Member Jurisdictions	ongoing
▫ **Climate Change-4:** Work with regional agencies, local employers, and schools to increase tele-work, compressed work weeks, alternative work locations, and flex schedules, and provide pretax employer transportation benefit programs.	CCTA	WCCTAC School Districts Employers Responsible West County Member Jurisdictions	long-term
▫ **Climate Change-5:** Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.	CCTA	WCCTAC West County Transit Operators Responsible West County Member Jurisdictions Transportation Network Companies	ongoing

Action	Lead Agency	Partner Agency	Timeline
▫ **Climate Change-6:** Coordinate with impacted jurisdictions, property owners, and other applicable agencies that own or maintain RRS that would be impacted by sea level rise, to coordinate and plan for inundation mitigation.	CCTA	WCCTAC Caltrans BCDC Responsible West County Member Jurisdictions Private property owners	long-term
▫ **Climate Change-7**: Enable regional agencies and local jurisdictions to refer to the Adapting to Rising Tides Adaptation Roadmap when planning for sea level rise.	CCTA	WCCTAC Responsible West County Member Jurisdictions BCDC West County transit operators	ongoing
▫ **Climate Change-8:** Study and explore parking management and curb and policy options that would address parking minimums and maximums curbside usage.	CCTA	WCCTAC Responsible West County Member Jurisdictions	mid-term
▫ **Climate Change-9:** Adopt local policies that prioritize mobility for GHG-reducing modes of transportation.	Responsible West County Member Jurisdictions	CCTA WCCTAC	mid-term
CHAPTER 11, TECHNOLOGY AND INNOVATION			
▫ **Innovation and Technology-1:** Promote the investigation and development of transportation-related innovations that reduce emissions and improve air quality and public health.	CCTA	WCCTAC	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Innovation and Technology-2:** Interconnect the West County signal system to enable remote access to the signals from a traffic management or operations center. These signals to be interconnected are yet to be identified, but will be selected based on the following criteria: • On RRS • In or providing access to a PDA, downtown or commercial district • Presence of bus routes at the intersection • Connection to BART • Presence of bicycle facilities at the intersection • High number of bicycle and pedestrian collisions • Geographic distribution across the Contra Costa County and the subregion • Connection to shared mobility hubs • High traffic volume	CCTA	WCCTAC West County Member Jurisdictions	mid-term
▫ **Innovation and Technology-3:** Examine the feasibility of implementing a pilot automated driving system or other modal technologies (such as an autonomous shuttle) somewhere in the West County area.	CCTA	WCCTAC MTC West County Member Jurisdictions West County transit operators Transportation Network Companies	mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Innovation and Technology-4:** Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.	CCTA	WCCTAC MTC West County Member Jurisdictions West County transit operators Transportation Network Companies	ongoing
▫ **Innovation and Technology-5:** Implement micromobility recommendations from the Countywide Bicycle and Pedestrian Plan, including those related to ordinances and RFPs, and work with operators to deploy micromobility systems built with industry best management practices.	CCTA	West County Member Jurisdictions	mid-term
▫ **Innovation and Technology-6:** Work with CCTA to determine a method for tracking the availability of EV charging stations.	CCTA	WCCTAC West County Member Jurisdictions	near-term
▫ **Innovation and Technology-7:** Work with CCTA to mediate adoption and implementation of emerging technologies to ensure that they are feasible and do not cause adverse effects on the transportation system.	CCTA	WCCTAC West County Member Jurisdictions	ongoing
▫ **Innovation and Technology-8:** Work with BART to expand the on-demand bicycle parking program for e-bicycles and scooters at BART stations throughout Contra Costa County.	BART	CCTA WCCTAC West County Member Jurisdictions	mid-term
▫ **Innovation and Technology-9:** Work with CCTA and local jurisdictions to implement the CCTA EV Readiness Blueprint.	CCTA	WCCTAC West County Member Jurisdictions	mid-term

Appendix D:

Transportation Modeling Results

Appendix D: Transportation Modeling Results

Table D-1: RTO Monitoring Location Peak-Hour LOS

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
23rd Street & Barrett Avenue	B	17	B	10	B	16	B	13
23rd Street & Garvin Avenue	C	22	B	10	B	20	C	34
23rd Street & Macdonald Avenue	A	10	B	17	A	10	B	17
23rd Street & Ohio Avenue	B	13	B	11	B	12	B	11
23rd Street & Rheem Avenue	B	11	A	10	A	9	C	25
Appian Way & I-80 EB ramps	B	19	A	9	B	17	A	8
Appian Way & I-80 WB ramps	C	22	C	22	C	23	C	25
Appian Way & La Paloma Road	B	14	A	10	B	15	B	11
Appian Way & Manor Road	C	24	B	14	B	17	B	14
Appian Way & San Pablo Avenue	D	44	B	20	D	41	**E**	**58**
Appian Way & San Pablo Dam Road	**F**	**90**	C	25	**F**	**85**	D	52
Appian Way & Sobrante Avenue	C	24	B	15	C	22	B	15
Appian Way & Tara Hills Drive/Canyon Drive	**E**	**56**	D	40	D	53	D	49
Appian Way & Valley View Road	A	8	A	9	A	8	A	9
Bayview Avenue & Carlson Boulevard	**F**	**83**	C	34	**E**	**77**	D	36
Carlson Boulevard & Broadway	A	6	A	5	A	5	A	4
Carlson Boulevard & Central Avenue	B	12	C	26	B	12	C	30
Carlson Boulevard & Cutting Boulevard	C	24	C	20	C	23	C	26
Carlson Boulevard & I-80 EB Ramps	B	12	B	11	B	12	B	19
Carlson Boulevard & I-80 WB Ramps	C	25	B	11	C	23	B	11
Central Avenue & I-80 EB Ramps	B	14	B	12	B	17	B	15
Central Avenue & I-80 WB Ramps	C	32	A	9	C	35	A	7
Cummings Skyway & Crockett Boulevard	A	6	A	6	A	3	A	6

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Cutting Boulevard & 23rd Street-Marina Bay Parkway	D	42	D	43	D	42	**E**	**73**
I-580 EB Off Ramp & Cutting Boulevard -Hoffman Boulevard	B	15	B	15	B	16	B	15
I-580 EB On Ramp & Harbour Way	B	14	A	9	B	14	B	10
I-580 EB Ramps & Canal Boulevard	C	26	D	37	C	27	D	44
I-580 EB Ramps & Castro Street	C	20	B	13	C	20	B	11
I-580 EB Ramps & Marina Parkway	A	6	A	7	A	7	A	8
I-580 EB Ramps & Marine Street	A	1	A	1	A	1	A	1
I-580 EB Ramps & Regatta Boulevard	A	9	B	11	A	9	B	15
I-580 WB Ramps & Canal Boulevard	C	27	C	29	C	28	C	34
I-580 WB Ramps & Castro Street	B	17	D	36	B	17	D	36
I-580 WB Ramps & Central Avenue	B	12	B	15	B	12	B	12
I-580 WB Ramps & Marina Parkway	A	9	A	8	A	9	A	8
I-80 EB Ramps & El Portal Drive	B	19	A	9	B	14	A	9
I-80 EB Ramps & Fitzgerald Drive	A	8	B	11	A	8	A	3
I-80 EB Ramps & Hilltop Drive	C	21	C	26	B	17	B	17
I-80 EB Ramps & Pinole Valley Road	C	21	D	38	C	20	E	73
I-80 EB Ramps & Willow Avenue	B	17	C	23	C	22	E	56
I-80 HOV Ramps & Cutting Boulevard	C	22	A	6	D	40	A	1
I-80 On/Off Ramps & Potrero Avenue	B	20	**F**	**363**	B	18	**F**	**243**
I-80 WB Off Ramp & Cutting Boulevard	C	21	B	11	C	21	B	11
I-80 WB Off Ramp & El Portal Drive	C	33	C	23	C	28	B	19
I-80 WB Off Ramp & Willow Avenue	B	16	B	13	B	20	B	14
I-80 WB Ramps & Barrett Avenue	**F**	**87**	**F**	**85**	**E**	**70**	**E**	**74**
I-80 WB Ramps & Hilltop Drive	0	0	B	11	0	0	A	7
I-80 WB Ramps & Pinole Valley Road	**E**	**62**	C	29	D	47	C	23
Richmond Parkway & Barrett Avenue	A	9	A	9	A	9	A	10
Richmond Parkway & Blume Drive/ Ramps	D	46	D	38	D	46	D	49
Richmond Parkway & Gertrude Avenue	D	51	C	32	D	40	B	11
Richmond Parkway & Hilltop Drive	C	21	C	26	C	21	C	20

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Richmond Parkway & Ohio Avenue	B	11	A	10	B	10	A	9
Richmond Parkway & Parr Boulevard	**E**	**75**	B	12	**E**	**63**	B	16
Richmond Parkway/Fitzgerald Drive & I-80 Ramps	B	11	D	39	B	10	C	23
San Pablo Avenue & Barrett Avenue	C	24	D	37	C	27	C	28
San Pablo Avenue & Broadway Avenue/ El Portal Drive	C	25	C	23	C	23	C	22
San Pablo Avenue & Carlson Boulevard*	F	89	D	47	F	92	F	96
San Pablo Avenue & Central Avenue*	**E**	**65**	D	43	**E**	**62**	D	47
San Pablo Avenue & College Lane	C	31	C	34	C	27	**F**	**99**
San Pablo Avenue & Cummings Skyway	A	8	A	7	A	7	A	6
San Pablo Avenue & Cutting Boulevard	C	26	C	34	C	26	C	22
San Pablo Avenue & Garvin Avenue	B	10	A	8	B	11	B	13
San Pablo Avenue & Hilltop Drive	D	36	D	50	D	37	**F**	**94**
San Pablo Avenue & John Muir Parkway	**F**	**92**	**E**	**73**	**F**	**109**	**F**	**83**
San Pablo Avenue & Moeser Lane	B	14	C	20	B	15	A	9
San Pablo Avenue & Portrero Avenue	C	25	C	32	C	25	**E**	**63**
San Pablo Avenue & Road 20	D	54	C	31	D	42	C	32
San Pablo Avenue & Rheem Avenue	D	47	B	11	C	33	C	22
San Pablo Avenue & Richmond Parkway	**E**	**59**	D	43	**E**	**56**	D	39
San Pablo Avenue & Robert H Miller Drive	B	19	C	31	B	17	**F**	**90**
San Pablo Avenue & San Pablo Dam Road	**E**	**56**	D	38	D	46	D	44
San Pablo Avenue & Sycamore Avenue	C	32	C	27	C	30	C	23
San Pablo Avenue & Tara Hills	B	12	B	19	B	12	**F**	**84**
San Pablo Avenue & Tennent Avenue	B	13	**E**	**65**	B	12	**F**	**154**
San Pablo Avenue-Parker Avenue & Willow Avenue	B	19	A	9	B	18	A	10
San Pablo Dam Road & Castro Ranch Road	A	9	A	6	A	9	B	10

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
San Pablo Dam Road & I-80 EB Ramps	D	44	D	40	D	46	C	30
San Pablo Dam Road & I-80 WB Ramps	C	25	B	12	**F**	**156**	C	25
San Pablo Dam Road & May Road	B	11	A	7	A	10	A	8
San Pablo Dam Road & Valley View Road	C	21	A	9	C	21	A	8

Notes: Delay is average control delay reported in seconds. Cells that are bolded indicate performance below target. Downtown areas, key schools, and TPAs indicated with asterisk.

Appendix E:

RTO Measurement and Modeling Methodologies

Appendix E: RTO Measurement and Modeling Methodologies

Memorandum

DATE Published July 7, 2022, and Revised in October 2022

TO John Hoang and Matt Kelly, CCTA

FROM David Early and Torina Wilson, PlaceWorks
Erin Vaca, DKS Associates
Julie Morgan and Terence Zhao, Fehr & Peers

SUBJECT Regional Transportation Objectives Methodology Memorandum

This memorandum outlines the Regional Transportation Objectives (RTO) and the underlying methodology that PlaceWorks and its technical consultants (DKS and Fehr & Peers) modeled in preparation of the Contra Costa Transportation Authority (CCTA) Action Plan Updates. These RTOs cover all Action Plan and Countywide Transportation Plan (CTP) topics and were used to evaluate success in achieving the goals of each Action Plan.

Historically, each Regional Transportation Planning Committee (RTPC) has had latitude to select a set of Multimodal Transportation Service Objectives (MTSO) of its own choosing, and the various Action Plans have had differing MTSOs. In this round of Action Plan preparation, each RTPC continues to have the authority to craft its own RTOs. However, PlaceWorks worked with CCTA and the RTPCs to ensure that the new RTOs are as consistent as possible across the Action Plans and can ultimately be combined and consolidated into the future CTP.

The preliminary list of RTOs and their relevant chapter topics are:

- **Transit RTO-1: Transit Mode Share.** Increase the mode share of transit trips in the subregion.
- **Transit RTO-2: Mode Share to BART.** Increase the number of riders who access BART using means other than automobiles, including transit and active transportation.
- **Transit RTO-3: Transit Trip Time.** Optimize peak-hour and peak direction travel time for transit as compared to automobile travel time for the same trip.
- **Transit RTO-4: High Quality Transit Access.** Increase the proportion of urbanized land area in the subregion served by high quality transit.
- **Transit RTO-5: Paratransit and Community-Based Transportation Programs Access.** Increase the number of rides by paratransit and community-based transportation programs.

- **Active Transportation RTO-1: Increase Active Transportation Mode Share.** Increase the mode share of bicycling and walking in the subregion.
- **Active Transportation RTO-2: Low-Stress Bicycle Network.** Increase the proportion of the countywide low-stress bicycle network (LSBN) completed in the subregion.
- **Active Transportation RTO-3: Unprotected Trail Crossings.** Eliminate the number of locations where the low-stress bicycle network has an unprotected crossing of a heavily traveled vehicle route.
- **Roadways RTO-1: Freeway Delay Index.** Maintain peak-hour delay index on select freeway segments.
- **Roadways RTO-2: Freeway Buffer Index.** Maintain peak-hour freeway segment buffer index on select freeway segments.
- **Roadways RTO-3: Intersection LOS.** Maintain peak-hour LOS at selected intersections in urban areas.
- **Roadways RTO-4: Roadway Segment LOS.** Maintain peak-hour segment LOS on selected two-lane roadways outside of urban areas.
- **Safety RTO-1: KSI Collisions.** Eliminate killed or severely injured (KSI) collisions in the subregion.
- **Safety RTO-2: Active Transportation Collisions.** Eliminate collisions in the subregion that involve users of active transportation.
- **Safety RTO-3: Active Transportation Collisions Near Schools.** Eliminate active transportation collisions within 500 feet of a school.
- **Equity RTO-1: EPC Low-Stress Bicycle Network Completion.** Ensure that the proportion of the countywide LSBN that has been completed in EPCs is equal to or greater than the proportion completed in the subregion as a whole.
- **Equity RTO-2: Collisions in EPCs.** Ensure that the proportion of KSI and active transportation-involved collisions in EPCs in the subregion is equal to or less than the proportion of the subregion's population living in EPCs.
- **Equity RTO-3: EPC Job Access: Driving.** Ensure that the number of jobs that can be reached by EPC residents with a 30-minute drive is equal to or greater than the number of jobs that can be reached with a 30-minute drive by all residents in the subregion.
- **Equity RTO-4: EPC Job Access: Transit.** Ensure that the number of jobs that can be reached by EPC residents with a 45-minute transit trip is equal to or greater than the number of jobs that can be reached with a 45-minute transit trip by all residents in the subregion.
- **Equity RTO-5: EPC Access to High Quality Transit.** Ensure that the proportion of urbanized EPC land area in the subregion served by high-quality transit is equal to or greater than the urbanized land area served by high-quality transit in the subregion as a whole.
- **Climate Change RTO-1: SOV Mode Share.** Reduce the mode share of single-occupant vehicles in the subregion.
- **Climate Change RTO-2: Carpool Mode Share.** Increase the mode share of carpooling in the subregion.

- **Climate Change RTO-3: Vehicle Miles Traveled.** Reduce vehicle miles traveled per capita in the subregion.
- **Climate Change RTO-4: Greenhouse Gas Emissions.** Reduce transportation greenhouse gas emissions per capita in the subregion.
- **Climate Change RTO-5: Zero Emission Vehicles.** Increase ownership of zero-emission vehicles in the subregion.
- **Technology and Innovation RTO-1: Signal Interconnect Project.** Complete the project to upgrade traffic signals to regional ethernet and/or fiber optic interconnection.

The remainder of this memo explains the methodologies that the PlaceWorks team used to measure each of these RTOs. These same methodologies will be documented in a revision to CCTA's Technical Procedures and will be available for ongoing assessment of attainment of the RTOs.

The travel demand modelling work described in this memo was completed by DKS using the CCTA Countywide Travel Demand Model. This four-step, trip-based model was most recently revalidated to a 2018 base year. The standard CCTA travel demand model incorporates land use (population and employment) forecasts for 2020, 2030, and 2040 and can interpolate these inputs for interim years. Because the standard model cannot produce scenarios beyond 2040, a special version of the model script was developed for the Action Plan analyses. In addition to accommodating a year 2050 horizon, the revised version incorporated enhanced traffic assignment procedures for freeway express lanes.

For the Action Plan updates, land use inputs for the horizon year of 2050 were developed based on the Metropolitan Transportation Commission (MTC) Plan Bay Area 2050 projections for Contra Costa County. The transportation network assumed the Baseline 2050 scenario was derived from the CCTA Transportation Expenditure Plan (TEP) No Build scenario, to reflect only already-programmed improvements. In addition to the TEP projects, some additional projects were programmed from the Tri-Valley TVTC Nexus Study. These include express lanes assumed on Interstate (I-) 680, consistent with CCTA's Innovate 680 program, and removal of the extension of the Bay Area Rapid Transit (BART) service to Livermore. Going forward, it will be important to coordinate with ACTC, LAVTA, and other Alameda County agencies to incorporate planned (or funded) transportation infrastructure improvements and transit service enhancements into any modeling and analyses. This coordination should occur through the TVTC Technical Advisory Committees and Policy Board, and all local agencies should be actively involved in cooperative coordination on project implementation.

For existing conditions, the project team selected 2019 data to reflect pre-pandemic conditions, as it is not possible to predict how traffic conditions might stabilize as the post-pandemic "new normal" continues to evolve.

Transit RTOs

Transit RTO-1: Transit Mode Share

Increase the mode share of transit trips in the subregion.

Mode share was estimated for the Action Plan updates, both for transit (which is the focus of this section) and for the bicycle/pedestrian and climate change topics (as explained in later sections of this memo).

For the Action Plan analysis, mode share in each subregion was estimated using data collected by the American Community Survey (ACS), as published by the Census Bureau, and travel demand model outputs.

For current conditions, the PlaceWorks team reported ACS data, which provides mode share estimates for work commute trips for workers 16 years of age and over. The current data release includes one-year estimates for 2019, which was reported in the Action Plans. Mode share for all trips and all modes was modeled using outputs from the CCTA Countywide Travel Demand Model. Specifically, the person trip tables from the mode choice step of the model were aggregated to calculate mode share by geographic subarea. These trip tables are in "production-attraction" format, meaning that trips are tabulated based on the zone of production (location of residence for all home-based trip purposes) and zone of attraction (work or other location) rather than representing directional trips.

The CCTA Countywide Travel Demand Model produces person trip matrices by mode by Traffic Analysis Zone (TAZ) for each trip purpose and income quartile. Scripts were developed to summarize this data by RTPC and mode. Most mode share RTOs were summarized by the geographic area of production, but the home-based work trip mode share was summarized by the attraction zone as well.

Mode shares were calculated for the 2019 base year and 2050 baseline scenarios. The mode alternatives specified in CCTA Countywide Travel Demand Model include:[31]

- Drive Alone
- Shared Ride 2 Occupants
- Shared Ride 3+ Occupants
- Transit with Walk Access
- Transit with Drive Access
- Bicycle
- Walk

[31] Mode share in the Tri-Valley Action Plan was calculated using a combination of the CCTA Countywide Travel Demand Model and additional ACS data to assess the entire "Planning Area" which include Contra Costa County and the Alameda County portion of the Tri-Valley area.

The summary tables and charts for these modes report mode share for the subregion of production (all trips), for commute mode share by subregion of production (home-based work trips only), and for commute mode share by subregion of attraction or job location (home-based work trips only).

Transit RTO-2 Mode Share to BART

Increase the number of riders who access BART using means other than automobiles, including transit and active transportation.

This RTO is intended to assess accessibility to BART using transit and active transportation. MTC conducts a regional survey every 7 to 10 years of riders across all stations to gather data on travel mode used to access transit stations (including BART stations). The project team gathered the data from MTC/BART and aggregated the results for the stations in Contra Costa County and the Alameda County portion of the Tri-Valley, grouping them by the five subregions. Subsequently, the team analyzed the results to determine the mode share for accessing BART (transit, active transportation, or automobiles).

Transit RTO-3: Transit Trip Time

Optimize peak-hour and peak direction travel time for transit as compared to automobile travel time for the same trip.

This RTO is intended to measure the difference in travel time for a motorist as compared to a transit user. The origin-destination pairs shown in Table E-1 were selected for this metric. Travel times were developed for each mode based on both the peak-commute and reverse-commute directions of travel for the morning and afternoon peak periods.

Table E-1. Corridors for Transit-Auto Travel Time Comparison

Subarea	Origin-Destination Pairs
West County	Richmond BART and Contra Costa Center (Pleasant Hill BART station) Hercules Transit Center and Salesforce Transit Center in San Francisco Contra Costa College and 14th Street/Broadway in Oakland
Central County	Walnut Creek BART station and Montgomery Street BART station Walnut Creek BART and San Ramon Transit Center Dublin BART and San Ramon Transit Center
East County	Antioch BART station and 12th Street (Oakland) BART station
Lamorinda	Orinda BART station and Montgomery Street (San Francisco) BART station
Tri-Valley	ACE Vasco Station and San Jose Diridon station Dublin-Pleasanton BART station and Montgomery Street (San Francisco) BART station Downtown Livermore and Dublin/Pleasanton BART Dublin/Pleasanton BART and Bishop Ranch San Ramon and BART Walnut Creek Dublin BART and San Ramon Transit Center

Transit travel times along key routes were based on published transit schedules. Bus schedules are assumed to account for expected roadway congestion that would impact bus routes. Driving travel times were derived from INRIX roadway analytics for weekdays (Tuesday to Thursday) for April 2019. The forecasted driving travel times for 2050 were derived from the CCTA Countywide Travel Demand Model, using peak-period drive-alone automobile travel times between all TAZs. Because the model's transit travel times are not accessible in an interpretable format, it was assumed that the transit frequency and travel times would remain constant between 2019 and 2050.

Transit RTO-4: High Quality Transit Access

Increase the proportion of urbanized land area in the subregion served by high quality transit.

This RTO assesses the percentage of urban land that has access to high quality transit by walking and bicycling. The project team used GIS to map the distribution of high frequency transit stops[32] in the five subareas and identified the high quality transit zones, or areas within a ¼-mile radius of each of the stations. Additionally, the team mapped all rail and ferry stations and identified areas within a ½-mile radius around each station. The project team summed the high quality transit zone areas in acres and subtracted it from the total acreage of urban land in the subregion; the result was the percentage of urban land within walking or bicycling distance to high quality transit.

Transit RTO-5: Paratransit and Community Based Transportation Programs Access

Increase the number of rides by paratransit and community based transportation programs.

This RTO assesses the demand for paratransit[33] and community based transportation services. The project team estimated paratransit demand by aggregating the number of trips in 2019 from ADA-mandated and non-ADA-mandated paratransit/accessible transportation providers in the county (from their Accessible Transportation Strategic Plan). The project team recognizes that this metric is not the most efficient way to track access and use of paratransit services, particularly for agencies that encourage elderly and disabled groups to use fixed-route or other transportation services. However, this metric begins the conversation of tracking accessible transportation in the Action Plans.

[32] High frequency transit stops are those with headway frequency of 15 minutes or fewer.

[33] Paratransit programs are individualized transit services without fixed routes or timetables that supplement mass transit services.

Active Transportation RTOs

Active transportation RTOs are based on the countywide Low-Stress Bicycle Network (LSBN) adopted in the 2018 CCTA Countywide Bicycle and Pedestrian Plan. This network consists of existing and planned Class 1 bicycle paths and Class 4 cycle tracks throughout Contra Costa County. The project team identified low stress facilities in the Alameda County portion of the Tri-Valley area by reviewing the Alameda County Transportation Commission (Alameda CTC) Active Transportation Plan and the MTC active transportation facility webmap.

Active Transportation RTO-1: Increase Active Transportation Mode Share

Increase the mode share of bicycling and walking in the subregion.

The methodology for this RTO was identical to the methodology for the "Mode Share of Transit Trips" RTO. See the previous section for more details.

Active Transportation RTO-2: Low-Stress Bicycle Network

Increase the proportion of the countywide low stress bicycle network completed in the subregion

The LSBN is a component of the CCTA Countywide Bicycle and Pedestrian Plan (CBPP) adopted in 2018.[34] The CBPP introduced a new way of evaluating a facility's "Level of Traffic Stress," in which roadways are evaluated on several factors, including, but not limited to, the speed and number of vehicles and presence and width of bicycle facilities. Facilities are given a rating from one (least stressful) to four (most stressful) to evaluate the stress a bicycle rider will experience. The goal of the 2018 CBPP is to ensure the countywide bicycle network is complete and rated either Level of Traffic Stress 1 (most children can feel safe riding on these facilities) or Level of Traffic Stress 2 (The "interested but concerned" adult population will feel safe riding on these facilities). Ultimately, construction of the entire LSBN would result in an increase in bicycle mode share and a reduction in KSI collisions. It is assumed that the LSBN includes only Class I and Class IV facilities.

For this RTO, the project team updated the LSBN map to reflect any portions that have been constructed since the 2018 CBPP and map adoption. Once the LSBN was updated, the number of total miles in the network at buildout was calculated and compared with the total miles already completed.

[34] The project team identified low stress facilities in the Alameda County portion of the Tri-Valley area by reviewing the Alameda CTC Active Transportation Plan and the MTC active transportation facility webmap.

Active Transportation RTO-3: Unprotected Trail Crossings

Eliminate the number of locations where the low-stress bicycle network has an unprotected crossing of a heavily traveled vehicle route.

PlaceWorks created an ArcGIS point data set to identify each location where the LSBN (Class I and Class IV facilities) crosses a vehicle roadway. Then we ranked the crossing by how protected it is using Google Maps.

- **Fully protected** by grade separation or a signalized intersection with cyclist protections.
- **Semi-protected** at an at-grade crossing with a beacon system, or with a signal but without cyclist protections.
- **Unprotected** at an at-grade crossing, which includes none of the improvements listed above.

This exercise was conducted for low-stress bicycle crossings of all arterials and major collectors in each subarea. The types of roadways included in this exercise were interstates, freeways, expressways, other principal arterials, minor arterials, and major collectors. The only roadways not included in this exercise were minor collectors and local routes.

Roadway RTOs

Roadways RTO-1: Freeway Delay Index

Maintain peak-hour delay index on select freeway segments.

The delay index is a measure of delay experienced by motorists on a roadway segment during a peak commute hour in a single direction. The delay index is calculated by measuring the time it takes to travel a segment of road during average peak-period congested conditions and comparing it to the time it takes to travel the same segment during uncongested, free-flow conditions. A delay index may also be calculated as the ratio of congested speed to uncongested speed, given that the distance is fixed on any given corridor.

All previous CCTA Action Plans used delay index as MTSOs for freeway facilities. Table E-2 lists the specific facilities to be evaluated with this metric for the current Action Plan updates; these segments are mapped in Figure E-1. While the performance targets used in the previous round of Action Plans are provided for reference, revised targets have been developed as part of the current planning process.

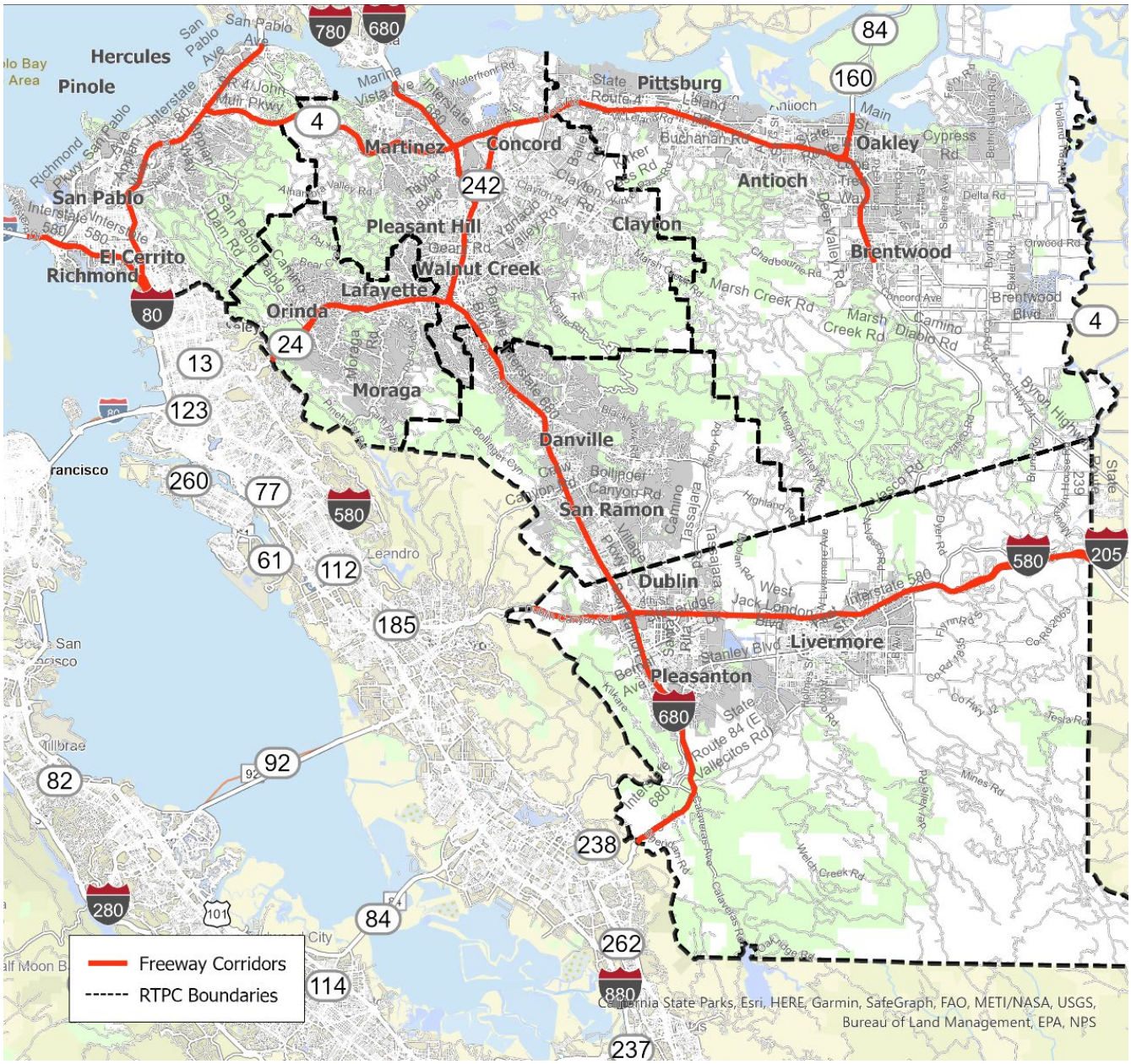
Table E-2. Freeway Facilities and Previous Performance Targets

RTPC	Facility	From	To	Previous Performance Target
WCCTAC (West County)	Interstate 80	Carquinez Bridge	Solano County Line	DI*≤3.0
	Interstate 580	I-80	Marin County Line	DI≤2.5
	State Route 4	I-80	Cummings Skyway	DI≤2.0
TRANSPAC (Central County)	Interstate 680	Benicia Martinez Bridge	I-680/SR-24 Interchange	DI≤ 4.0 (I-680)
	Interstate 680	I-680/SR-24 Interchange	Livorna Road	DI≤ 4.0 (I-680)
	State Route 242	SR-4/WO Port Chicago Highway	I-680/SO Willow Pass Road	DI≤ 3.0 (SR-242)
	State Route 4	Cummings Skyway	Willow Pass Road/Evora Road	DI≤ 5.0 (SR-4)
TRANSPLAN (East County)	State Route 4	Willow Pass Grade	Balfour Road	DI≤2.5
	State Route 160	SR-4	Sacramento County Line	DI≤2.5
Lamorinda (Southwest County)	State Route 24	Caldecott Tunnel	I-680	DI≤2.0
Tri-Valley (Southwest County)	Interstate 680	Livorna Road	I-580	DI≤2.0
	Interstate 680	I-580	SR-80	DI≤2.0
	Interstate 580	Eden Canyon Road	I-680	DI≤2.0
	Interstate 580	I-680	N Midway Road	DI≤2.0

Source: RTPC Action Plans.

** DI = Delay index*

Figure E-1. Freeway Facilities



The delay index (and the related average speed) were calculated for both the 2019 Base Year and 2050 Baseline scenarios, pivoting from observed data. The source of observed data for this RTO was speed data from INRIX Roadway Analytics, which was also used in the 2017 MTSO monitoring[35] and 2021 Congestion Management Plan (CMP) monitoring.[36] Observed 2019 speeds and travel times were calculated with INRIX data using April 2019 as a baseline. DKS downloaded one-minute interval data including travel time for all segments in Alameda and Contra Costa Counties. These data were processed using use a Python program to excerpt defined study areas from Table E-1 and Figure E-1, and filter holidays, defined peak hours, defined days of the week, and data points affected by construction and special events, or with low INRIX quality scores.

Baseline 2050 delay indices were forecast using the CCTA Countywide Travel Demand Model peak period traffic assignments by estimating the additional congested travel time that is expected on each segment of the study corridors. Components of this work included:

- Calculate average congested speed for 2019 was derived from INRIX Roadway Analytics for each segment (typically defined from one on ramp to the following off ramp).
- Obtain peak period congested speeds for 2019 and 2050 from the travel demand model for the same segments (note: free-flow speed is taken as the posted speed limit).
- Where the observed 2019 speed is lower than the modeled 2019 speed, scale the 2050 modeled speed by this ratio to calculate the corresponding delay index.

These calculations yielded existing and future delay index ratings for the segments of freeways listed in Table E-1. Existing delay index ratings were compared to adopted MTSO delay index thresholds, and the project team suggested revisions to the existing delay index thresholds for consideration by the RTPCs.

Roadways RTO-2: Freeway Buffer Index

Maintain peak-hour freeway segment buffer index on select freeway segments.

The “buffer index” metric is intended to measure reliability and relies on the same INRIX data pulled for the delay index RTO. The buffer index represents the extra buffer time (or time cushion) that most travelers add to their average travel time when planning trips to ensure on-time arrival. This extra time is added to account for any unexpected delay. The buffer index is expressed as a percentage and its value increases as reliability gets worse. For example, a buffer index of 40 percent means that, for a 20-minute average travel time, a traveler should budget an additional 8 minutes (20 minutes × 40 percent = 8 minutes) to ensure on-time arrival most of the time. In this example, the 8 extra minutes are called the buffer time.

[35] Contra Costa Sub-regional Action Plans for the RRS Multimodal Traffic Service Objectives (MTSO) Draft 2017 Monitoring Report (March 2018).

[36] 2021 Update of the Contra Costa Congestion Management Program (Draft Final Report).

The CCTA Countywide Travel Demand Model can output only average congested speeds and not 95th percentile speeds, so the buffer index is a monitoring metric, compiled for existing and observed conditions but not forecasts. The buffer index for each freeway corridor listed in The observed baseline and modeled results for freeway delay index on the freeway RRS are shown in Table 7-2. As shown, freeway corridors with especially high levels of delay (greater than 1.5 delay index) include I-80 (westbound in the morning and eastbound in the afternoon) and I-580, where the delay index is greater than 3.0 in the westbound direction in the morning (this result likely reflects delay at the Richmond Bridge toll plaza).

Based on current performance and the future modeled performance, this Action Plan carries forward the delay index standards in the 2017 West County Action Plan, which are 2.5 or less for I-580 and 2.0 or less for SR-4. This Action Plan sets a new target for I-80 of 3.5 or less, which is 0.5 higher than the 2017 West County Action Plan.

Roadways RTO-3: Intersection LOS

Maintain peak-hour LOS at selected intersections in urban areas.

Peak-hour intersection LOS was calculated for selected signalized intersections along the defined RRS in urban areas. Signalized LOS is a delay-based qualitative measure of traffic conditions. LOS is expressed in ratings from “A” through “F,” with “A” meaning that all traffic clears the intersection in every cycle and “F” meaning that drivers must wait through multiple cycles to clear the intersection.

Signalized intersection LOS was determined based on intersection turning movement counts (also called turning/traffic volumes), intersection geometry, and signal timing data, where available. The CCTA Technical Procedures specify that methods documented in the latest edition of the Highway Capacity Manual be used to measure signalized intersection LOS.[37] The relationship between average delay and LOS is shown in Table E-3.

Table E-3. Intersection LOS Definitions

Delay (Second/Vehicle)	Level of Service
≤10	A
> 10–20	B
> 20–35	C
> 35–55	D
> 55–80	E
> 80	F

Source: Highway Capacity Manual, 6th Edition, Exhibit 19-8.

[37] The 6th edition of the Highway Capacity Manual was published by the Transportation Research Board in January 2022.

The facilities evaluated using signalized intersection LOS or other intersection operational metrics in the previous round of Action Plans are listed in Table E-4. The performance of these Action Plan intersections and some additional locations was monitored in 2017. In addition, a subset of these intersections is regularly monitored as part of the Congestion Management Program, most recently in 2021. For all previously monitored intersections, intersection operational models have been built, and peak hour turning movement counts were collected to represent 2013, 2017, or 2021 conditions. Table E-5 summarizes the available data for intersection analysis.

Since the previous rounds of Action Plans and monitoring, some previously non-urban highway segments have been developed into signalized arterial corridors, and some roadways have been newly designated as RRS, potentially adding numerous additional signalized intersection locations to be analyzed. A small number of previously monitored intersections appear to fall on roadway facilities that are no longer proposed as RRS for this round of Action Plan updates.

For this analysis of 2019 and 2050 baseline conditions, the project team only reported on key locations, such as at the intersections of two RRS facilities, freeway ramp terminals, and intersections of local concern, as depicted in Figure E-2 through Figure E-6. In total, 343 intersections were analyzed for 2019 and 2050.

Table E-4. Signalized Intersection Level of Service: Previous Action Plans

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
WCCTAC (West County)	▫ Appian Way ▫ Carlson Boulevard ▫ Central Avenue ▫ Cummings Skyway ▫ Interstate 580 (I-580) ▫ Richmond Parkway ▫ San Pablo Avenue ▫ San Pablo Dam Road ▫ State Route 4 (SR-4) ▫ 23rd Street	LOS D on all intersections except for San Pablo Avenue and San Pablo Dam Road where LOS E is acceptable.
TRANSPAC (Central County)	▫ Alhambra Avenue ▫ Bailey Road ▫ Clayton Road ▫ Contra Costa Boulevard ▫ Geary Road ▫ North Main Street ▫ Pacheco Boulevard ▫ Pleasant Hill Road ▫ Taylor Boulevard ▫ Treat Boulevard ▫ Ygnacio Valley Road/Kirker Pass Road	LOS F on all intersections. [a]

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
TRANSPLAN (East County)	▫ Auto Center Drive ▫ Bailey Road ▫ Balfour Road ▫ Brentwood Boulevard/Main Street ▫ Buchanan Road ▫ Deer Valley Road (improved portion) ▫ East 10th Street/Harbour Street (in Pittsburg) ▫ East 18th Street ▫ Fairview Avenue ▫ Hillcrest Avenue ▫ James Donlon Boulevard (including future extension) ▫ Laurel Road ▫ Leland Road (both West and East)/Delta Fair Boulevard ▫ Lone Tree Way/A Street ▫ Oak Street/Walnut Boulevard (within Brentwood) ▫ Ninth Street/Tenth Street (in Antioch) ▫ Pittsburg-Antioch Highway ▫ Railroad Avenue/Kirker Pass Road ▫ Sand Creek Road/Dallas Ranch Road ▫ Somersville Road ▫ Wilbur Avenue ▫ Willow Pass Road	LOS D on all intersections except for Bailey Road where LOS E is acceptable.
Lamorinda (LPMC and Southwest County)	▫ Camino Pablo/San Pablo Dam Road ▫ Pleasant Hill Road	Side Street Delay, no LOS rating.
Tri-Valley (TVTC and Southwest County)	▫ Alcosta Boulevard ▫ Bernal Avenue ▫ Bollinger Canyon Road ▫ Camino Tassajara ▫ Danville Boulevard ▫ Dougherty Road ▫ Dublin Boulevard ▫ Fallon Road ▫ First Street/Railroad Avenue ▫ Hopyard Road ▫ Iron Horse Trail ▫ Jack London Boulevard ▫ San Ramon Road	LOS E on all intersections except no standard for intersections in downtown areas and those exempt by General Plans.

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
	▫ San Ramon Valley Boulevard ▫ Santa Rita Road ▫ Stanley Boulevard ▫ Stoneridge Drive ▫ Sunol Boulevard ▫ Sycamore Valley Road ▫ Tassajara Road ▫ Vasco Road	

Source: RTPC Action Plans

[a]. Other TRANSPAC intersection performance targets are defined by volume to capacity (V/C) ratios or the number of cycles.

Table E-5. Signalized Intersections and Available Intersection Data

Region	Previous Action Plans	2017 Monitoring	2021 CMP	Total Signalized Intersections on RRS	Total Selected for Existing and Baseline Scenarios
Central County	54	29	27	183	76
East County	41	41	9	233	83
Lamorinda	13	12	1	47	12
Tri-Valley	151	29		301	91
West County	40	58	23	172	81
Total	**299**	**169**	**60**	**936**	**343**

Figure E-2. Arterial Intersections and Roadway RRS (West County)

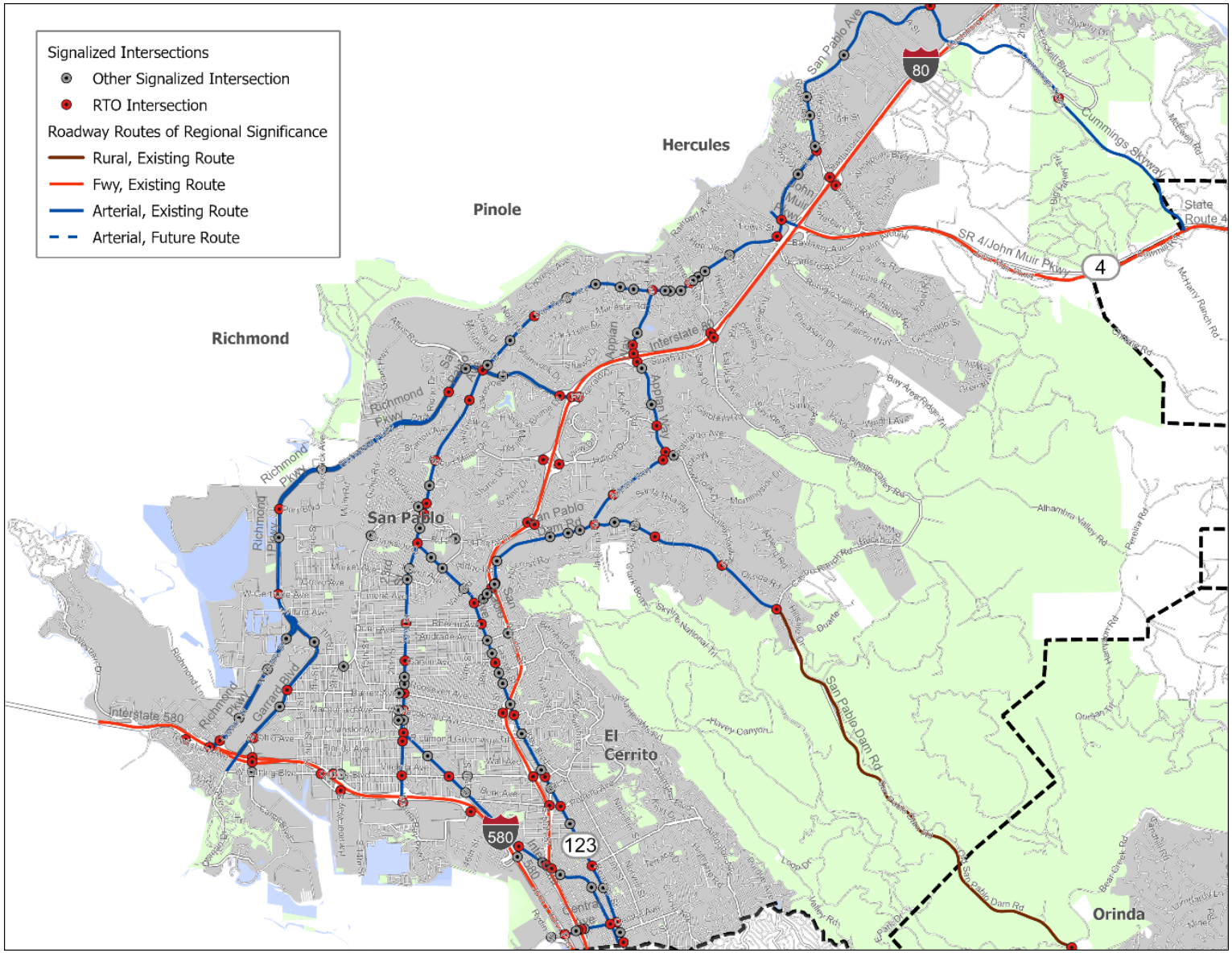


Figure E-3. Arterial Intersections and Roadway RRS (Central County)

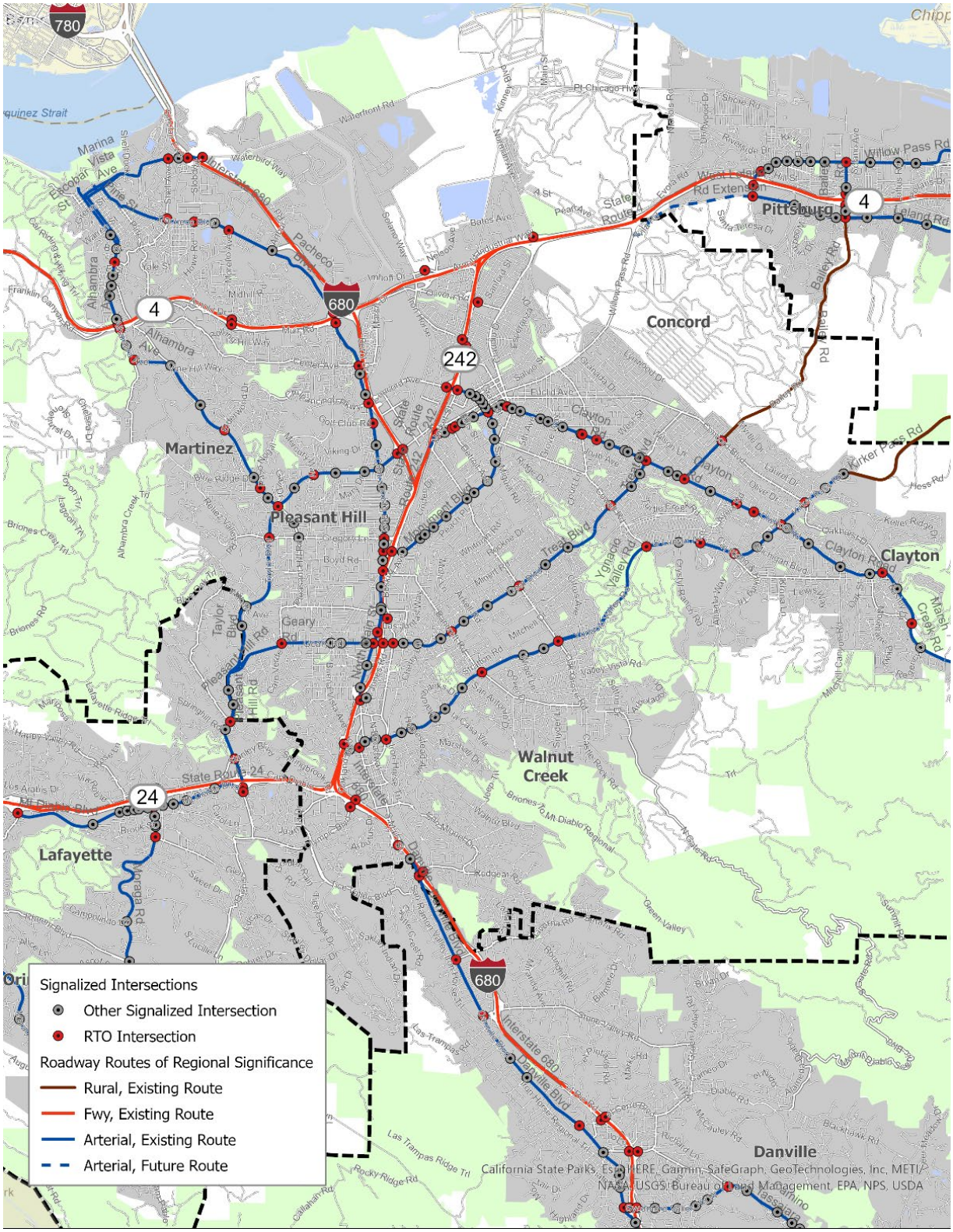


Figure E-4. Arterial Intersections and Roadway RRS (East County)

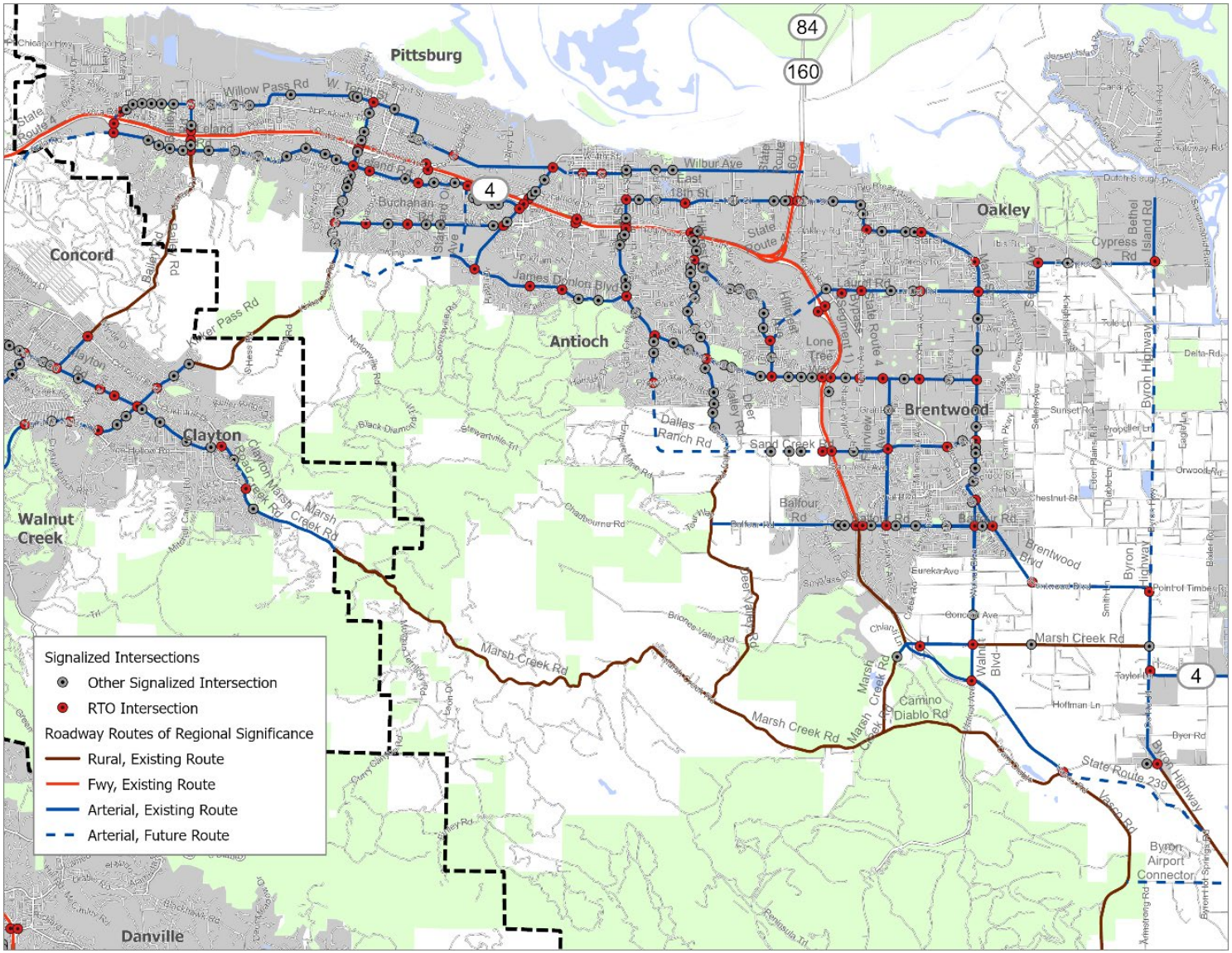


Figure E-5. Arterial Intersections and Roadway RRS (Southwest County – Lamorinda)

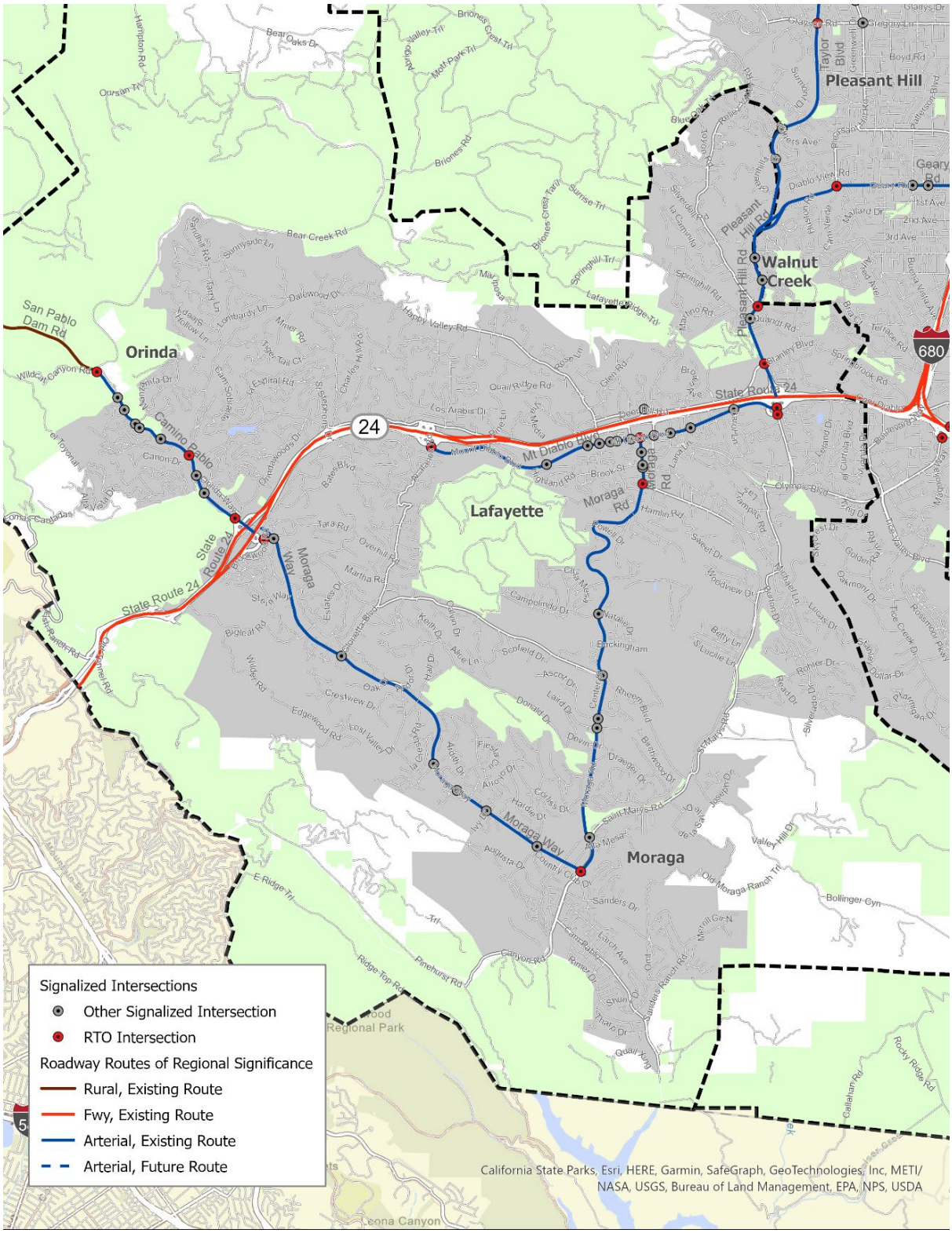
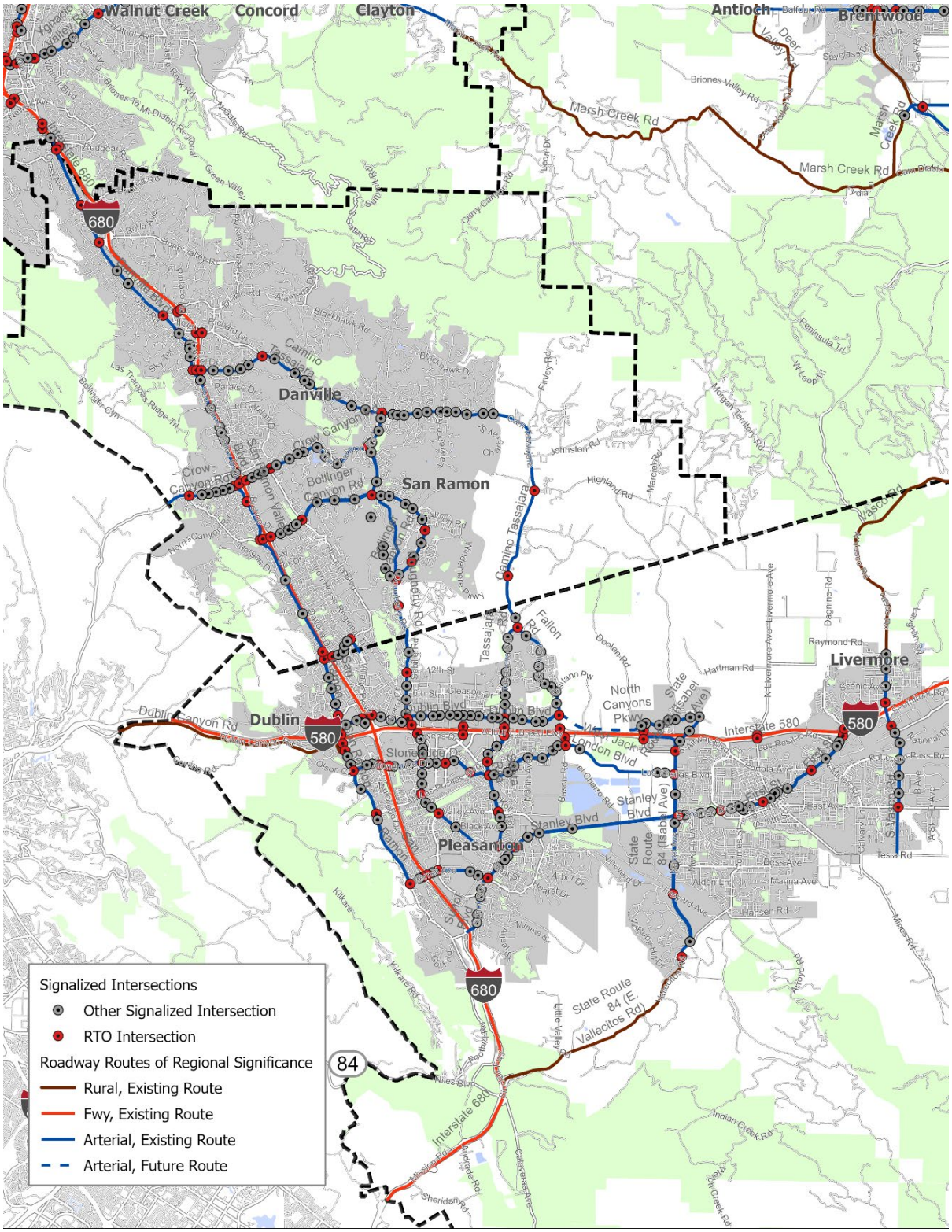


Figure E-6. Arterial Intersections and Roadway RRS (Southwest County – Tri-Valley)



The methodology for calculating signalized intersection LOS followed standard practice. Where available, observed counts were extracted from the operational models built for the 2017 MTSO monitoring and the 2021 CMP monitoring. For the additional intersections analyzed for this round of Action Plans, historical turning volume estimates were obtained from the Streetlight data subscription maintained by CCTA. The Streetlight data represent a spring 2019 weekday condition excluding holidays.

Peak-hour traffic volumes for the base year and future year were estimated using the Furness process specified in the CCTA Technical Procedures and summarized here. This process develops intersection turning movement forecasts using observed counts and model outputs, as follows:

- Calculate the Model Correction Volume for each network link (i.e., the difference between the projected peak-hour volume for the validation (base year) run and actual peak-hour traffic volumes).
- Determine the forecast peak-hour approach and departure volumes for each study intersection by adding the Model Correction Volume to the model output.
- Develop intersection turning movement volumes that are consistent with the approach and departure volumes by balancing projected intersection turning movements with actual turning movement volumes using an iterative process.
- Check reasonableness by comparing adjusted intersection turning movement volumes with both the existing count data and the raw model output.
- Review volume adjustments that do not appear reasonable and, if appropriate, revise adjustments.

Intersection geometry was derived or checked using Google Earth and timing plans requested for any newly added intersection locations. In the absence of local timing plans, optimized timing settings were applied.

Signalized intersection LOS was assessed by implementing Highway Capacity Manual (HCM) methods in the Trafficware Synchro ("Synchro") software package.[38] The outcome of this modeling yielded a list of all intersections and their baseline 2019 and projected 2050 LOS ratings.

Roadways RTO-4: Roadway Segment LOS

Maintain peak-hour segment LOS on selected two-lane roadways outside of urban areas.

LOS was analyzed for specific segments on non-urban roadways. Roadway segment LOS is a measure of traffic efficiency and smoothness of flow along roadway segments that are not constrained by a nearby traffic signal. This has previously been calculated for the East County in accordance with

[38] The latest HCM (7th ed.) was released in February 2022 and is not yet implemented in Synchro, so Synchro reports signalized intersection delay and LOS based on the HCM 6th edition (there is no significant difference for the analysis of signalized intersections).

the methods specified in the 2010 HCM using average speed for Class I highways, which are two-lane facilities in non-urban areas that motorists expect to traverse at relatively high speed.

DKS ran LOS analysis for the roadway segments as listed in Table E-6 and shown in Figures E-2 through D-6.

Table E-6. Two-Lane Non-urban Roadway Corridors

Subarea	Facility	From	To
West County	San Pablo Dam Road	Castro Ranch Road RTPC Boundary	RTPC Boundary Wildcat Canyon
Central County	Bailey Road	Concord Boulevard	RTPC Boundary
	Kirker Pass Road	RTPC Boundary	James Donlon Boulevard
	Kirker Pass Road	Clearbrook Drive	RTPC Boundary
East County	Byron Highway	State Route 4	Alameda County
	Camino Diablo Road	Marsh Creek Road	Vasco Road
	Marsh Creek Road	Deer Valley Road	Vineyard Parkway
	Vasco Road	Walnut Boulevard	Alameda County
	Bailey Road	Leland Avenue	RTPC Boundary
	State Route 4 Bypass	Balfour Road	Marsh Creek Road
	Deer Valley Road	Sand Creek Road	Marsh Creek Road
	Marsh Creek Road	RTPC Boundary	Deer Valley Road
Lamorinda	San Pablo Dam Road	RTPC Boundary	Wildcat Canyon
Tri-Valley	State Route 84 (E. Vallecitos Road)	Interstate 680	Ruby Hill Drive
	Dublin Canyon Road	Palo Verde Road	Foothill Road
	Vasco Road	Alameda County	Dalton Avenue

The latest edition of HCM (7th edition) specifies a new version for calculating segment LOS, which requires substantially more data than the previous HCM 6th edition/2010 approach. The new approach requires information on passing constraint condition (none, passing lane, or passing constrained), flow rate (vehicles per hour), percentage heavy vehicles, vertical slope (five classifications based on segment length and slope), and horizontal curvature (five classifications based on curve radius and superelevation). Since these data are not available for the segments to be studied, the Action Plan updates retained the HCM 6th edition approach, which simply relates LOS to average speed, as shown in Table E-7. For this analysis, DKS used the travel demand model to predict congested speed for all segments to be analyzed.

Table E-7. LOS for Two-Lane Non-urban Roadways

Level of Service	Average Speed (Miles per Hour)
A	>55
B	>50–55
C	>45–50
D	>40–45
E	≤40

Source: Highway Capacity Manual, 2010, Exhibit 15-3.

Safety RTOs

Safety RTO-1: KSI Collisions

Eliminate killed or severely injured (KSI) collisions in the subregion.

DKS obtained KSI collisions data for the Planning Area from the Transportation Injury Mapping System (TIMS)[39] as the basis for the safety RTOs. TIMS collision records represent cleaned and geocoded data compiled by the Statewide Integrated Traffic Records System (SWITRS) maintained by the California Highway Patrol. Collision recode geocoding was reviewed for accuracy, and any obviously miscoded records were removed or recoded. Collision records were downloaded for the period spanning January 1, 2016, through December 31, 2019, and loaded into a Geographic Information System for further processing by planning subregion.

Safety RTO-2: Active Transportation Collisions

Eliminate collisions in the subregion that involve users of active transportation.

The number of active transportation collisions was developed using the same TIMS data set described above. The active transportation KSI collisions were then tabulated and mapped by planning subregion.

[39] Transportation Injury Mapping System (TIMS), Safe Transportation Research and Education Center, University of California, Berkeley, 2022.

Safety RTO-3: Active Transportation Collisions Near Schools

Eliminate active transportation collisions within 500 feet of a school.

This RTO was developed using the same TIMS data set described previously. The project team used GIS school site polygon data to create a 500-foot buffer around school sites and determined which of the geocoded collisions occurred within these school site buffers. The resulting data were tabulated and mapped by subregion. The records identified through GIS analysis were individually reviewed to confirm that the collisions involved students using active transportation.

Equity RTOs

Equity RTO-1: EPC Low-Stress Bicycle Network Completion

Ensure that the proportion of the countywide LSBN that has been completed in EPCs is equal to or greater than the proportion completed in the subregion as a whole.

The methodology for this RTO is identical to that of Active Transportation RTO-2, except that it applies specifically to Equity Priority Community (EPC) areas. Facilities in the EPC areas are given a rating from one (least stressful) to four (most stressful) to evaluate the stress a bicycle rider will experience. The goal of the 2018 CBPP is to ensure the countywide bicycle network is complete and rated either Level of Traffic Stress 1 (most children can feel safe riding on these facilities) or Level of Traffic Stress 2 (The "interested but concerned" adult population will feel safe riding on these facilities). Ultimately, construction of the entire LSBN would result in an increase in bicycle mode share and a reduction in KSI collisions. It is assumed that the LSBN includes only Class I and Class IV facilities.

For this RTO, the project team updated the LSBN map to reflect any portions that have been constructed since the 2018 CBPP and map adoption.[40] Once the LSBN was updated, the number of total miles in the network upon buildout was calculated and compared with the total miles already completed.

Equity RTO-2: Collisions in EPCs

Ensure that the proportion of KSI and active transportation-involved collisions in EPCs in the subregion is equal to or less than the proportion of the subregion's population living in EPCs.

This RTO was developed using the same TIMS data set described for the Safety RTOs. Using GIS, this analysis mapped the boundaries of identified EPCs. For each subregion and the county as a whole, the average annual rate of KSI and active transportation collisions per population was calculated for the

[40] The project team identified low stress facilities in the Alameda County portion of the Tri-Valley area by reviewing the Alameda CTC Active Transportation Plan and the MTC active transportation facility webmap.

EPCs as well as each planning subregion and the Planning Area as a whole. To develop these metrics, population estimates at the block group level were taken from the American Community Survey 2019 Five Year Estimates, Table B01003. This RTO was not tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

Equity RTO-3: EPC Job Access: Driving

Ensure that the number of jobs that can be reached by EPC residents with a 30-minute drive is equal to or greater than the number of jobs that can be reached with a 30-minute drive by all residents in the subregion.

The travel demand model's map of TAZs was compared to identified EPCs in Contra Costa County and designated each TAZ as either "EPC" on "non-EPC." Based on the CCTA Travel Demand Model's peak-period drive-alone travel times, the TAZs that could be reached within a 30-minute drive from each TAZ in the study area were identified and the jobs in those TAZs were summed. The average number of jobs per capita in each TAZ that is reachable within 30 minutes was calculated for EPC and non-EPC TAZs, and the results were compared. This RTO was not tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

Equity RTO-4: EPC Job Access: Transit

Ensure that the number of jobs that can be reached by EPC residents with a 45-minute transit trip is equal to or greater than the number of jobs that can be reached with a 45-minute transit trip by all residents in the subregion.

The travel demand model's map of TAZs was compared to identified EPCs in Contra Costa County and designated each TAZ as either "EPC" on "non-EPC." Based on the CCTA Travel Demand Model's peak-period transit travel times, the TAZs that could be reached within a 45-minute transit journey from each TAZ in the study area were identified and the jobs in those TAZs were summed. The average number of jobs per capita in each TAZ that is reachable within 45 minutes was calculated for EPC and non-EPC TAZs, and the results were compared. This RTO was not tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

Equity RTO-5: EPC Access to High Quality Transit

Ensure that the proportion of urbanized EPC land area in the subregion served by high-quality transit is equal to or greater than the urbanized land area served by high-quality transit in the subregion as a whole.

The methodology for this RTO is identical to Transit RTO-4, except that it applies specifically to EPC areas. This RTO assesses the percentage of urban land in EPC areas that has access to high quality transit by walking and bicycling. The project team used GIS to map the distribution of high frequency transit stops in the countywide EPC areas and identified the high quality transit zones, or areas within a quarter-mile radius from each of the stations. Additionally, the team mapped all rail and ferry stations in the EPC areas and identified areas within a ½-mile radius around each station. The project team

summed the high quality transit zone areas in EPC areas in acres and subtracted it from the total acreage of urban land in the EPC areas; the result was the percentage of urban land within walking or bicycling distance to high quality transit.

Climate Change RTOs

Climate Change RTO-1: SOV Mode Share

Reduce the mode share of single-occupant vehicles in the subregion.

The methodology for this RTO was identical to the methodology for the "Mode Share of Transit Trips" RTO, except that the metric associated with this RTO tracked a decrease in overall single-occupant vehicle (SOV) mode share, not an increase as desired for transit and active transportation mode share.

Climate Change RTO-2: Carpool Mode Share

Increase the mode share of carpooling in the subregion.

The methodology for this RTO is identical to the methodology for "SOV Mode Share," RTO-1, except that the metric associated with this RTO tracked a decrease in vehicle mode share by carpool, not SOV mode share.

Climate Change RTO-3: Vehicle Miles Traveled

Reduce vehicle miles traveled per capita in the subregion.

VMT per capita was modeled for the 2019 Base Year and Baseline 2050 condition using outputs from the CCTA Countywide Travel Demand Model. Scripts tabulating VMT per capita at the residential location and VMT per employee at the worksite for each TAZ had already been developed as part of CCTA's Technical Procedures update. Final processing was done in a spreadsheet, and results were tabulated by subregion.

Climate Change RTO-4: Greenhouse Gas Emissions

Reduce transportation greenhouse gas emissions per capita in the subregion.

This RTO was based on the VMT data developed, as described previously. VMT inputs were developed for the most recent Emission Factor (EMFAC) mobile source emissions model maintained by the California Air Resources Board. Subregional scenarios was created for the 2019 Base Year and 2050 Baseline conditions. Total tons of GHG emissions were divided by the subregional population assumed in the CCTA Countywide Travel Demand Model to arrive at average daily GHG emissions per capita.

Climate Change RTO-5: Zero Emission Vehicles

Increase ownership of zero-emission vehicles in the subregion.

The California Energy Commission tracks zero-emission vehicle (ZEV) ownership in partnership with the Department of Motor Vehicles. Data are updated annually in April and are published on the Zero Emission Vehicle and Infrastructure Statistics web page. Vehicle population is also updated annually in April, to reflect the number of vehicles on the road during the previous calendar year. The vehicle population number includes vehicles whose registration is either current or less than 35 days expired.

Total registrations by vehicle type were available by county and zip code, and these data were applied to estimate the ZEV ownership by subregion.

Technology RTOs

Technology and Innovation RTO-1: Signal Interconnect Project

Complete the project to upgrade traffic signals to regional ethernet and/or fiber optic interconnection.

Interconnected signal systems communicate with other signals or systems. Signal interconnect helps to establish a connection between the traffic signals and the central system, which enables remote access to the signals from the local agency locations or the traffic management or operations center. This allows signal timings to be adjusted remotely during regular day-to-day operations, major incidents, and special events. Interconnection enables cross-jurisdiction communications, coordination, and data exchange in response to varying traffic conditions.

Information was collected from cities regarding signal systems to identify the percentage of signals that are currently interconnected through ethernet-based communications. The assembled data determined the level of signal interconnection as compared to the total number of signals with the jurisdiction and countywide as a whole.

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