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Planning for Tomorrow's Transportation

Lamorinda Action Plan

Proposal for Adoption | March 2023

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SOUTHWEST AREA TRANSPORTATION COMMITTEE

Member Jurisdictions:

THE SEAL OF CONTRA COSTA COUNTY CALIFORNIA

TOWN OF MORAGA, CALIFORNIA NOVEMBER, 1974

LAFAYETTE

ORINDA

Lamorinda 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]

Southwest Area Transportation (SWAT) Committee Members

- Candace Anderson, District II Supervisor, Contra Costa County
- Karen Stepper, Council Member, Town of Danville
- Teresa Gerringer, Mayor, City of Lafayette
- Renata Sos, Council Member, Town of Moraga
- David Hudson, Mayor, City of San Ramon
- Amy Worth, Council Member (emeritus), City of Orinda
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- Andy Dillard, Town of Danville
- Mike Moran, City of Lafayette
- Bret Swain, Town of Moraga
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Lamorinda Planning and Management Committee (LPMC) Members

- Teresa Gerringer, Mayor, City of Lafayette
- Renata Sos, Council Member, Town of Moraga
- Amy Worth, Council Member (emeritus), City of Orinda

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- Mike Moran, City of Lafayette
- Patrick Golier, City of Lafayette, LPMC staff
- Bret Swain, Town of Moraga
- Shawn Knapp, Town of Moraga
- Sivakumar Natarajan, City of Orinda

[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, SWAT TAC, LPMC TAC, member jurisdictions, and the SWAT and LPMC Policy Boards in plan preparation.

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Abbreviations

ADA	Americans with Disability Act
BART	Bay Area Rapid Transit
CBPP	Countywide Bicycle and Pedestrian Plan
CEQA	California Environmental Quality Act
CCTA	Contra Costa Transportation Authority
CCWD	Contra Costa Water District
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
ITS	Intelligent Transportation System
KSI	Killed or Severely Injured
LPMC	Lamorinda Planning Management Committee

LOS	Level of Service
LSBN	Low-Stress Bicycle Network
LTIF	Lamorinda Transportation Impact Fee
LTIP	Lamorinda Transportation Improvement Program
MPH	miles per hour
MTC	Metropolitan Transportation Commission
MTSO	Multimodal Transportation Service Objectives
NNPHVT	Net New Peak Hour Vehicle Trip
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
RFP	request for proposal
RRS	Routes of Regional Significance
RTO	Regional Transportation Objective
RTPC	Regional Transportation Planning Committee
SB	Senate Bill
SOV	Single-Occupant Vehicle
SR-	State Route
STMP	Subregional Transportation Mitigation Program
SWAT	Southwest Area Transportation
TAC	Technical Advisory Committee
TDM	Transportation Demand Management
TEP	Transportation Expenditure Plan
TIMS	Transportation Injury Mapping System
TLC	Transportation for Livable Communities
TRANSPAC	Transportation Partnership and Cooperation committee

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

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Lamorinda Action Plan

Chapter 1: Introduction

This document is the Action Plan covering the incorporated and unincorporated communities throughout the Lamorinda 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 it's formulaic share of 18 percent return to source 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 or 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 Lamorinda subregion, which is the subject of this Action Plan, encompasses the incorporated jurisdictions of Lafayette, Moraga, and Orinda, as well as unincorporated portions of southwestern Contra Costa County.

CCTA is responsible for leading the development of and accepting the locally 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 described later in this Action Plan, the old term Multimodal Transportation Service Objectives (MTSOs) have been renamed to Regional Transportation Objectives (RTOs) for this Action Plan.

[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, LPMC is the Authority-designated RTPC for the Lamorinda area. The Action Plans 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.

This Action Plan requires collaboration among several agencies and jurisdictions. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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.

This Action Plan has been developed to be consistent with local General Plans, which were considered in creation of this Action Plan. Should there be cases where there is conflict between this Action Plan and a local jurisdiction's General Plan, the local jurisdiction's General Plan shall prevail.

Action Plan Contents

The Lamorinda 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 looks at 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 Lamorinda.
- **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.

- **Climate Change (Chapter 9)** identifies the RTOs and Actions related to climate change and transportation.
- **Innovation and Technology (Chapter 10)** identifies the RTOs and Actions related to innovation and new technology.
- **Financial Outlook (Chapter 11)** includes funding and multijurisdictional planning information.
- **Procedures for Notification, Review, and Monitoring (Chapter 12)** includes project notification procedures and the process for general plan review.

Chapters 5 to 10 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 Action Plan. A consolidated list of Actions for all chapter topics in this Action Plan can be found in Appendix C.

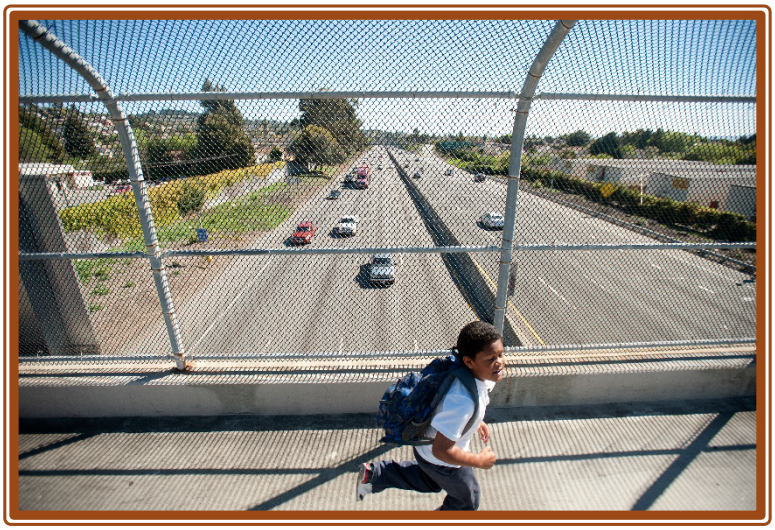
Relationship of this Action Plan to the Countywide Transportation Plan

This update of the Lamorinda Action Plan has been prepared simultaneously with updates to the other four subregional Action Plans and uses a comprehensive update approach that ensures the critical components of each Action Plan will be similar to one another, with modifications as needed due to the unique needs of the Lamorinda area 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 the Lamorinda area 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, 30 percent of the responses were specific to the Lamorinda area (the most of any 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 Lamorinda area focused on safe routes to schools, Bay Area Rapid Transit (BART) access, transportation electrification, and speeding on roads. Specific comments included:

- Increase traffic-calming solutions around schools and improve general Safe Routes to School techniques
- Increase controlled crossings of major roads
- Explore first- and last-mile connections to BART
- Improve bicycle and pedestrian facilities with traffic lights and bicycle activation of traffic signals
- Expand County Connection service to middle and high school students
- Explore small bus options
- Explore feasibility of autonomous vehicles
- Reduce frequency of automobile speeding

Additional outreach to the Lamorinda subregion occurred through a second round of public outreach and two publicly noticed meetings of local jurisdiction municipal bodies. This outreach included two additional pop-up events, attendance at a City of Lafayette Transportation and Circulation Commission meeting, and a City of Lafayette City Council meeting. Feedback at these events was largely similar to feedback received in March and April 2022, with most comments focusing on street safety, improving BART service, and reducing congestion (particularly related to school drop off and pick up).

Input received from these outreach efforts provided CCTA, its consultants, and Lamorinda 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 the 2009 and 2017 Action Plans; however, they have been renamed to accommodate new topics in this Action Plan, specifically because not all of them refer to service levels. An RTO consists of a "metric" and a "standard." 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. 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 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, climate change, and technology and innovation. This Action Plan carries forward the previously adopted MTSOs and rebrands them as "regional transportation objectives" to incorporate not only all modes of transportation, but new objectives such as safety, climate change, and innovation and technology.

The CCTA's *Implementation Guide* defines the areas of consideration that should be addressed in each Action Plan, 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 21 RTOs identified in this Action Plan. These RTOs are summarized in tables and described in detail in Chapters 5 through 10. Refer to Appendix A to see a summary of all RTOs and their targets. Refer to Appendix B for a description of RTOs that were considered but not recommended for adoption in this Action Plan.

- **Transit RTO-1: Transit Mode Share.** Increase the mode share of transit trips in the subregion.
- **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.
- **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 Program 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 active transportation 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 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.
- **Climate Change RTO-1: Single-Occupant (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 (VMT).** Reduce VMT per capita in the subregion.
- **Climate Change RTO-4: Greenhouse Gas (GHG) Emissions.** Reduce transportation GHG emissions per capita in the subregion.
- **Climate Change RTO-5: Zero-Emission Vehicles (ZEVs).** Increase the share of ZEVs in the subregion.
- **Technology and Innovation RTO-1: Signal Interconnection 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 the Lamorinda area; these conditions are the basis for formulation of this Action Plan and include description of baseline and projected transportation conditions for the Lamorinda area 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 Lamorinda, as well as projections of future travel demand on major Lamorinda area 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 this 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 of 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 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. 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.

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

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 remote work, or 30 percent with mitigation. 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 remote work 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 renewed 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 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 County.

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.

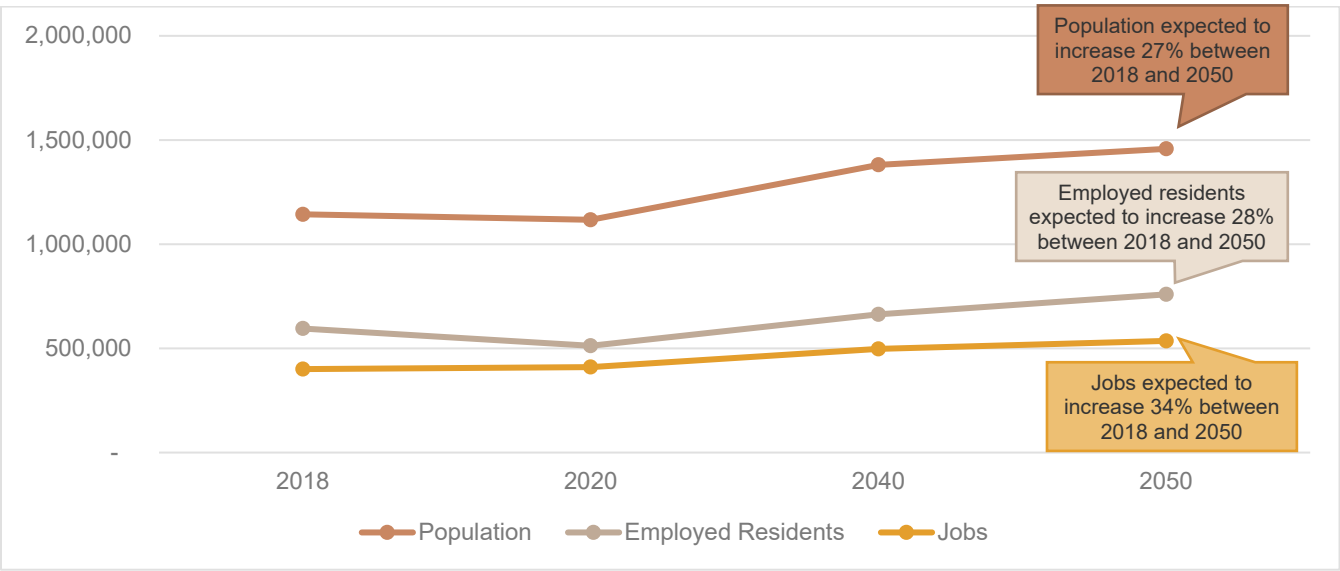
[6] BART, Monthly Ridership Report, July 2022, https://www.bart.gov/sites/default/files/docs/202207%20MRR.pdf.

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 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

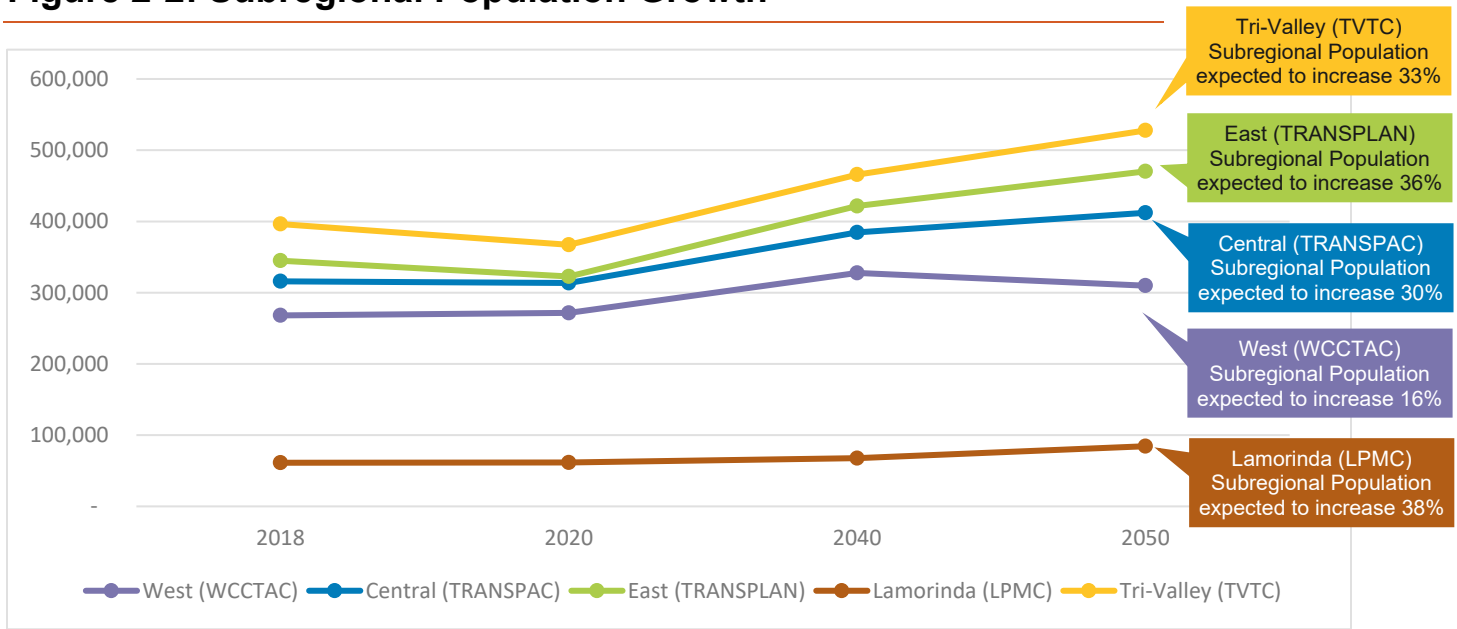
Countywide forecasts for population, employed residents, and jobs are shown in Figure 2-1, which shows a downward trend of population and employed residents occurred between 2018 and 2020 due to the COVID-19 pandemic. Projecting beyond 2020, all three categories are expected to follow fairly similar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

Figure 2-1: Contra Costa County Demographic Growth



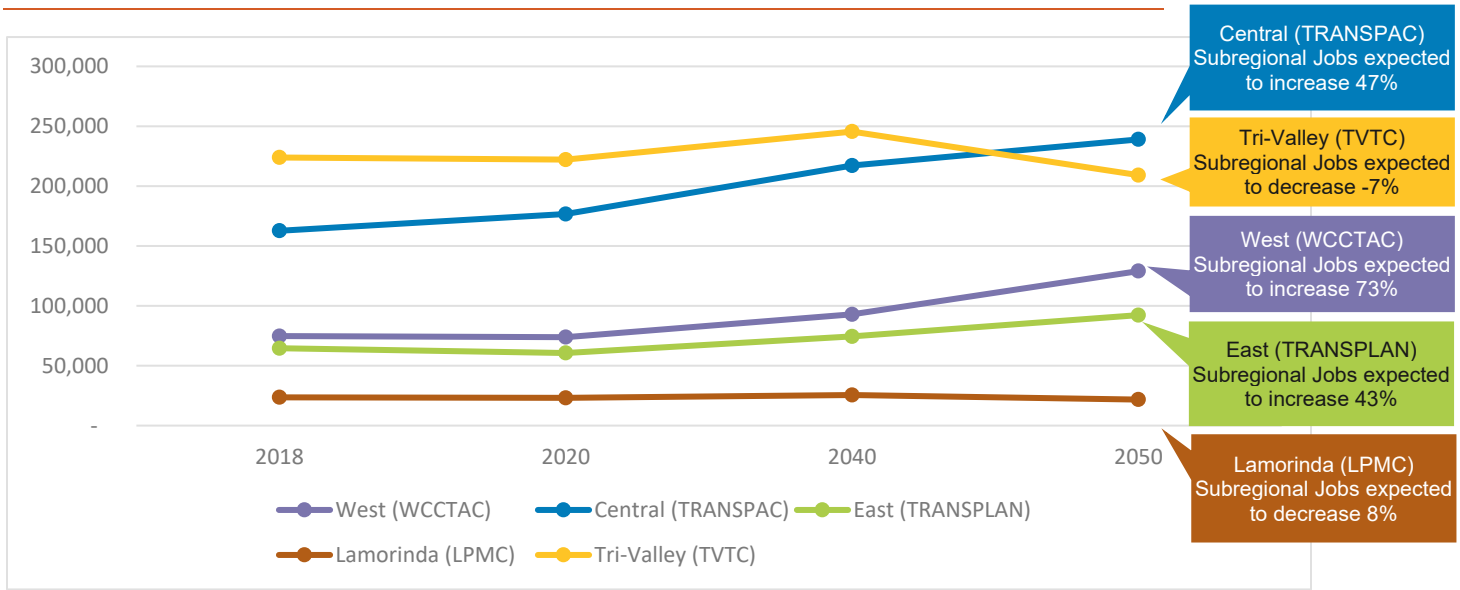
The five subregional forecasts for population growth are shown in Figure 2-2. The Lamorinda population, represented by the orange line, is projected to grow at a rate of 38 percent between 2018 and 2050, which is the highest rate of all Contra Costa County subregions. However, by 2050, the Lamorinda area is anticipated to be home to about 84,419 people, which is the subregion with the lowest Contra Costa County population.

Figure 2-2: Subregional Population Growth



Subregional forecasts for jobs are shown in Figure 2-3. In the Lamorinda area (represented by the orange line), jobs are expected to decline by eight percent between 2018 and 2050. The only other subregion anticipated to lose jobs is the Tri-Valley subregion, losing seven percent between 2018 and 2050.[7]

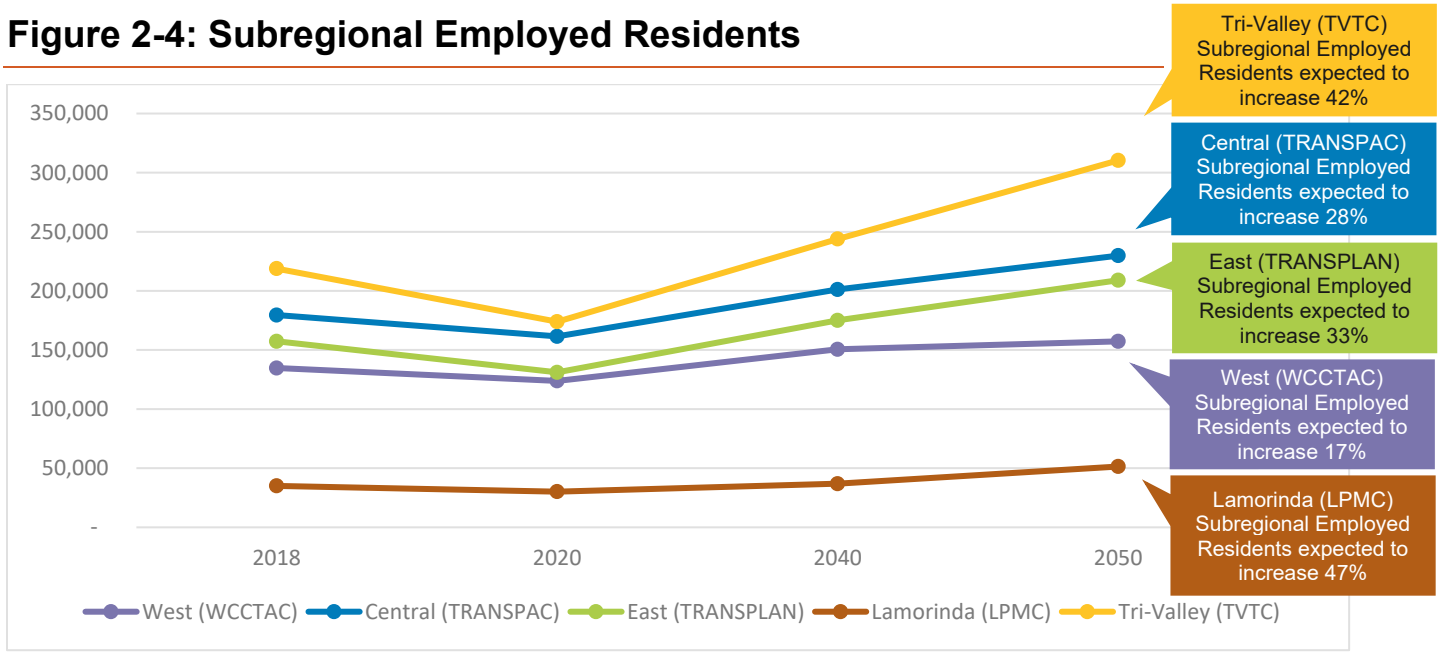
Figure 2-3: Subregional Job Growth



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

Subregional forecasts for employed residents are shown in Figure 2-4. Again, the Lamorinda area is represented by the orange line. Countywide, the percentage of employed residents is expected to grow faster than its population, with the Lamorinda area projected to experience 47 percent growth of employed residents between 2018 and 2050, the highest growth rate of any of the subregions.

Figure 2-4: Subregional Employed Residents



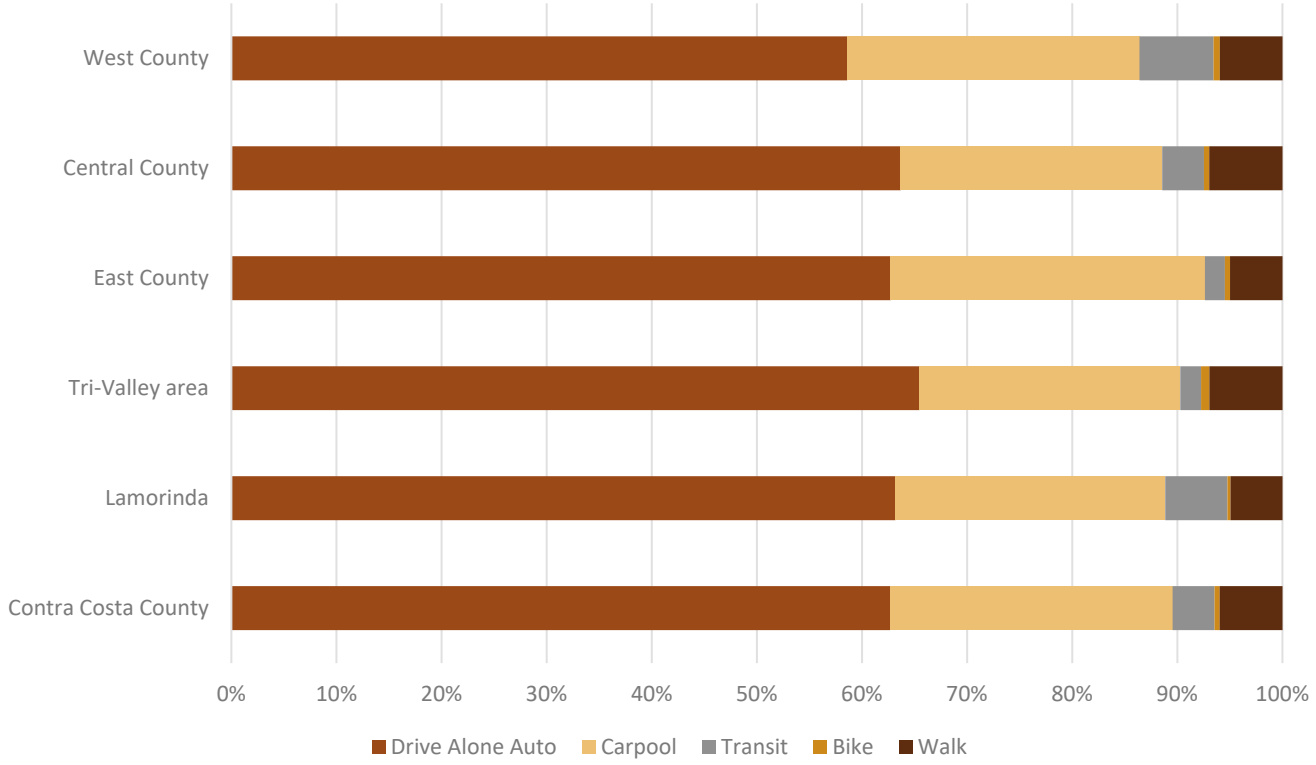
Commute Patterns and Travel Demand Forecasts

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 Lamorinda are anticipated to increase each year as the local population continues to grow. 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.

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, the Lamorinda area has more hills than the West County subregion. Further, the Lamorinda area is generally less urban than other subregions like Central or West County. Therefore, the mode share for each mode of transportation varies between subregions, as illustrated in Figure 2-5.

Figure 2-5: Mode Share of All 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.[8] 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.

[8] 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 Lamorinda 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 Lamorinda 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 66 percent by automobile in the Lamorinda subregion, which shows a lower share accounted for by carpooling in Lamorinda than the entire county.

Table 2-1: Means of Transportation to Work in Contra Costa County and the Lamorinda Subregion (2019)

Mode	Contra Costa County			Lamorinda Subregion		
	Estimate	Margin of Error	Percentage Mode Share	Estimate	Margin of Error	Percentage Mode Share
Total:	**544,376**	**±3,447**		**25,898**	**1,064**	
Car, truck, or van - drove alone	367,467	±3,409	68%	15,416	829	60%
Car, truck, or van - carpooled	62,385	±2,486	11%	1,504	285	6%
Public transportation (excluding taxicab)	59,068	±1,981	11%	4,574	472	18%
Taxicab, motorcycle, bicycle, walked, or other means	19,344	±2,462	4%	1,092	269	4%
Worked from home	36,112	±1,310	7%	2,190	699	8%

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

Note: The American Community Survey found that eight percent of Lamorinda workers were found to work remotely in 2019. While the number of workers working remotely rose dramatically during the COVID-19 pandemic, there is 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 into 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 Lamorinda and Contra Costa County as a whole. The modeling results show that most work trips by Lamorinda residents are made by automobile, specifically those driving alone. Lamorinda's transit mode share for work trips is higher than the county's, reflecting the available BART service in the subregion. Active transportation trips account for a very small portion of commute trips made by Lamorinda 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 Lamorinda area commuters are projected to remain relatively similar to existing shares, with modest decreases in the drive-alone auto and an increase in transit mode shares and the projected population and employment distribution of 2050.

As shown in Table 2-3, commuters to jobs in the Lamorinda area 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 carpool and transit mode shares.

Table 2-2: Modeled Home-to-Work Mode Share: Lamorinda Residents

	Contra Costa County		Lamorinda Subregion	
	2019	2050	2019	2050
Drive-Alone Auto	72%	70%	65%	64%
Carpool	14%	15%	13%	13%
Transit	12%	13%	20%	21%
Bicycle	0.3%	0.5%	0.1%	0.1%
Walk	1.4%	2%	0.9%	0.8%

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 Lamorinda

	Contra Costa County		Lamorinda Subregion	
	2019	2050	2019	2050
Drive-Alone Auto	83%	79%	87%	86%
Carpool	12%	13%	10%	11%
Transit	3%	4%	1%	2%
Bicycle	0.4%	0.7%	0.3%	0.7%
Walk	2%	3%	2%	2%

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 for the county show that most trips in 2019 were made by automobile, with transit and active transportation modes accounting for less than 11 percent of all trips.

By 2050, the mode shares are expected to remain similar to 2019 conditions, with a steady drive-alone share, an increase in carpool mode share, a decrease in transit share, an increase in bicycle mode share, and decrease in walking mode share.

Table 2-4: Mode Share for all Trips: Lamorinda Subregion Residents[9]

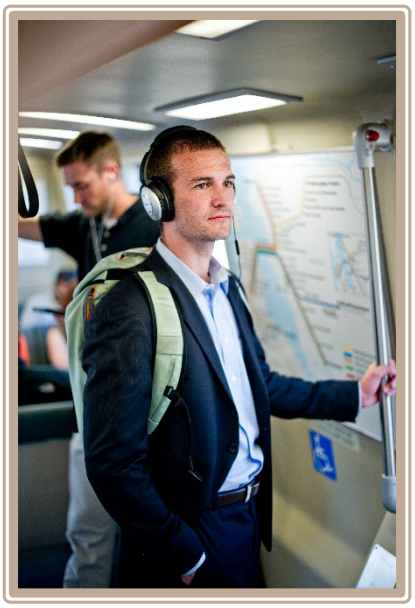
	Contra Costa County		Lamorinda Subregion	
	2019	2050	2019	2050
Drive Alone Auto	63%	63%	64%	64%
Carpool	27%	28%	26%	30%
Transit	4%	3%	6%	2%
Bicycle	0.5%	1%	0.3%	0.9%
Walk	6%	6%	5%	4%

Source: CCTA travel demand model and DKS Associates.

Note: Totals may not sum due to rounding.

[9] 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 Lamorinda jurisdictions to be higher than reported in Table 2-4.

Transit



The Lamorinda area is relatively well connected via public transit. Major public transit routes include the BART line along State Route (SR-) 24, which stops in Lafayette and Orinda. A County Connection bus line then connects those two BART stations with the Town of Moraga to the south of SR-24. See Chapter 5, Transit, Figure 5-1, for a map depicting these routes and facilities.

The existing 2017 Lamorinda Action Plan and the CTP resulted in several positive transit system programs and developments. These include, but are not limited to, the Lamorinda School Bus Program and various BART station improvements.

As described previously, the COVID-19 pandemic caused a decrease in use of public transportation that is still reverberating throughout Contra Costa County. In 2019, Lamorinda transit trips accounted for just over six percent of all trips in the 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 Lamorinda active transportation network includes low-stress facilities, Class I, Class IIIB, or IV, either adjacent to some major thoroughfares or on multi-use paths. 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.[10] 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.

[10] 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.

The existing 2017 Lamorinda Action Plan and the CTP resulted in several successful bicycle and pedestrian projects, including, but not limited to, completion of gaps in Class IV facilities and the resurfacing and striping of Moraga Way for a Class II bicycle lane.

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

Roadways

The Lamorinda area roadway network is one of the most comprehensive travel networks in the county and provides facilities for both automobile and non-automobile travel. Major facilities include SR-24, which links the Lamorinda area to Alameda County to the west and Central County to the east, and various roads that serve local and regional traffic. One major accomplishment in improving roadways in the Lamorinda subregion includes the Fourth Bore of the Caldecott Tunnel on SR-24 wherein off-peak vehicle delay has been eliminated. This project was completed by both CCTA and Lamorinda jurisdictions, totaling $240 million. See Chapter 7, Roadways, Figure 7-1, for a map depicting these routes and facilities.

Although there have been various capacity improvements to local roadways in the past decades, traffic congestion nonetheless increases as population and development increase, thereby necessitating ongoing congestion management on local roads, active transportation facilities, and with public transportation services. 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 90 percent of trips in Lamorinda are made by vehicle, either driving alone or as a carpool. This percentage translates to 32 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 Lamorinda 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.[11] 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 multi-disciplinary 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 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 challenges of our community's safety of people traveling will increase as mobility increases, especially 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.

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 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

[11] 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.

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 extreme heat, drought, wildfires, storms, flooding, and sea level rise; and more needs to be done to make the 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 mental, physical, dietary, and socioeconomic effects. Air pollution from mobile sources, especially diesel engines, increases the risk and occurrence of asthma, 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 9, which outlines RTOs and actions that will reduce GHGs through decisions that will support cleaner transportation options.

Innovation and Technology

CCTA and Lamorinda Planning Management Committee (LPMC) 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 Lamorinda 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 10, 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 Lamorinda area to accommodate additional housing. 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 LPMC 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 entire nation, Lamorinda'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 and safety; 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 Lamorinda.

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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 Lamorinda 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 Lamorinda jurisdictions are working holistically, tapping into various modes, and leveraging technology and innovation.

Long-range transportation planning in the Lamorinda area 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 13 goals for the transportation system in the Lamorinda area. Some goals pertain to one mode or topic in the Action Plan, while others are multimodal and/or cover more than one topic.

1. Plan for emergency access and evacuation as part of the transportation system.
2. Reduce the percentage of all SOV trips and decrease total VMT.
3. Pursue actions to increase transit ridership.
4. Design, construct, repair, and maintain a road network that is safer for all modes, especially for more vulnerable users, such as those using active transportation and near schools.
5. Coordinate local land use planning and regional transportation planning.
6. Discourage the use of RRS as alternate commute routes for congested freeways.
7. Pursue efficiency improvements to the transportation system through a holistic planning approach that considers shared mobility and prioritizes non-SOV transportation.
8. Support active transportation modes through the creation and improvement of bicycle and pedestrian facilities.
9. Improve mobility to, from, and within the Lamorinda communities' downtowns.
10. Reduce transportation impacts on the climate.
11. Ensure the transportation system is resilient in the face of climate change.
12. Support equitable mobility for all income groups, racial and ethnic groups, and all ages and abilities across all modes of transportation.
13. Continue the process of innovation and the development of new technologies in transportation.

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 Priority Development Area (PDA) development strategies.
3. Implement the Actions in the Plan and other projects and programs as needed through a coordinated approach among jurisdictions, partner agencies, transportation providers and other stakeholders to achieve and maintain the RTOs in this Action Plan.
4. Maintain established gateway capacity constraints at selected regional gateways with the intent of optimizing mobility on RRS.[12]
5. Consider safety as a top priority when designing new or modified travel corridors to be consistent with Countywide Vision Zero and Local Road Safety Plans, as applicable.
6. Support growth in downtowns, PDAs, transit priority areas, and other areas well-served by transit to lessen reliance on SOVs.
7. Promote transportation alternatives to reduce demand on existing facilities in lieu of widening roadways and further impacting the natural environment.
8. Support land use decisions that improve jobs-housing balance.
9. Coordinate with economic development agencies and non-governmental organizations to attract new employment to housing-rich areas in our downtowns and near high-quality transit.
10. Improve transit and active transportation access to PDAs.
11. Recognize, support, and use regional, state, and federal funds as available to subsidize transit as an essential and free or very low-cost service for transit-dependent people.
12. Consider complete corridors, complete streets, and bicycle and pedestrian needs in all neighborhood and roadway planning and design efforts.
13. Ensure the active transportation network is attractive and safe 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, as feasible, without compromising the safety of non-vehicular modes of travel.
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 multi-modal communities.

[12] Refer to Appendix E, Gateway Constraints Policy, for more information on Lamorinda Gateway Constraints.

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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, LPMC, 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 LPMC.

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.

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 level of service on roadways. The Action Plan also measures vehicle miles traveled, 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 Routes of Regional Significance, 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.

Historically, Action Plans have only been required to designate RRS for roadway 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 for transit facilities and active transportation as well as vehicles. It is important to note that designation of a facility as an RRS does not mean that improvements will be made to overcome any known or future capacity constraints. Further, Chapter 3 of this Action Plan lists several policies, including: "Maintain established gateway capacity constraints at selected regional gateways with the intent of optimizing mobility on RRS."[13]

Multimodal Corridor Maps of Routes of Regional Significance

To characterize the multimodal nature of RRS, CCTA has worked with LPMC 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

[13] Refer to Appendix E, Gateway Constraints Policy, for more information on Lamorinda Gateway Constraints.

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 Lamorinda Multimodal Corridor Map is shown in Figure 4-1. The maps are not intended to be exact, but to show travel corridors within the multimodal transportation network.

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.

Designation of an RRS does not give other entities jurisdiction over the planning, design, or enhancements of another jurisdiction's facilities. Further, designation as an RRS does not require a jurisdiction to enhance, widen, or add capacity, and there is no penalty for failing to maintain or achieve an objective on a designated RRS. The primary benefits of designating an RRS is to ensure neighboring jurisdictions are disclosing impacts of proposed development, that they coordinate with one another in the land use and transportation planning on or near the RRS, and a competitive edge when pursuing grant funding.

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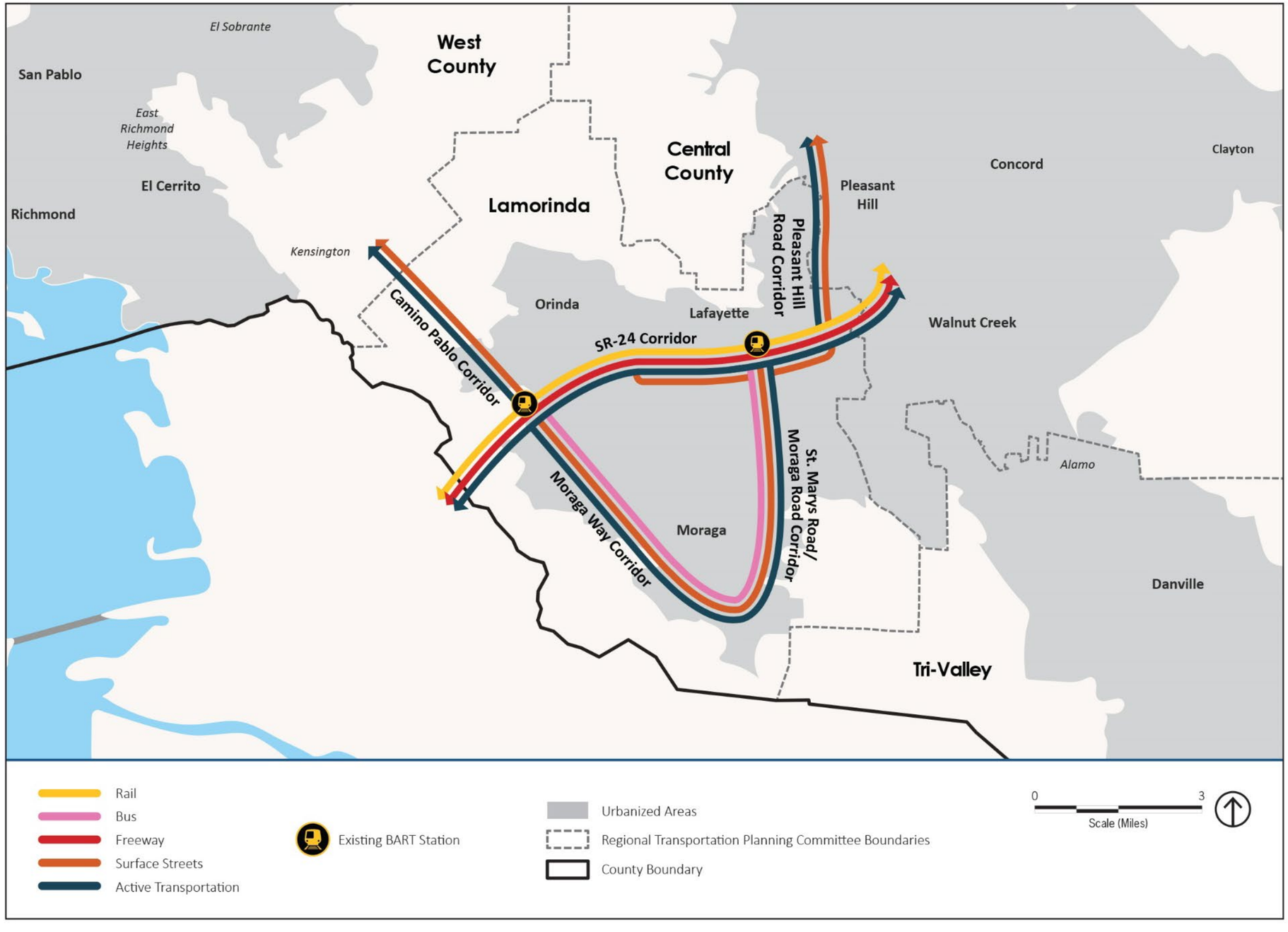
Figure 4-1: Lamorinda Area Multimodal Corridor Map



* 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

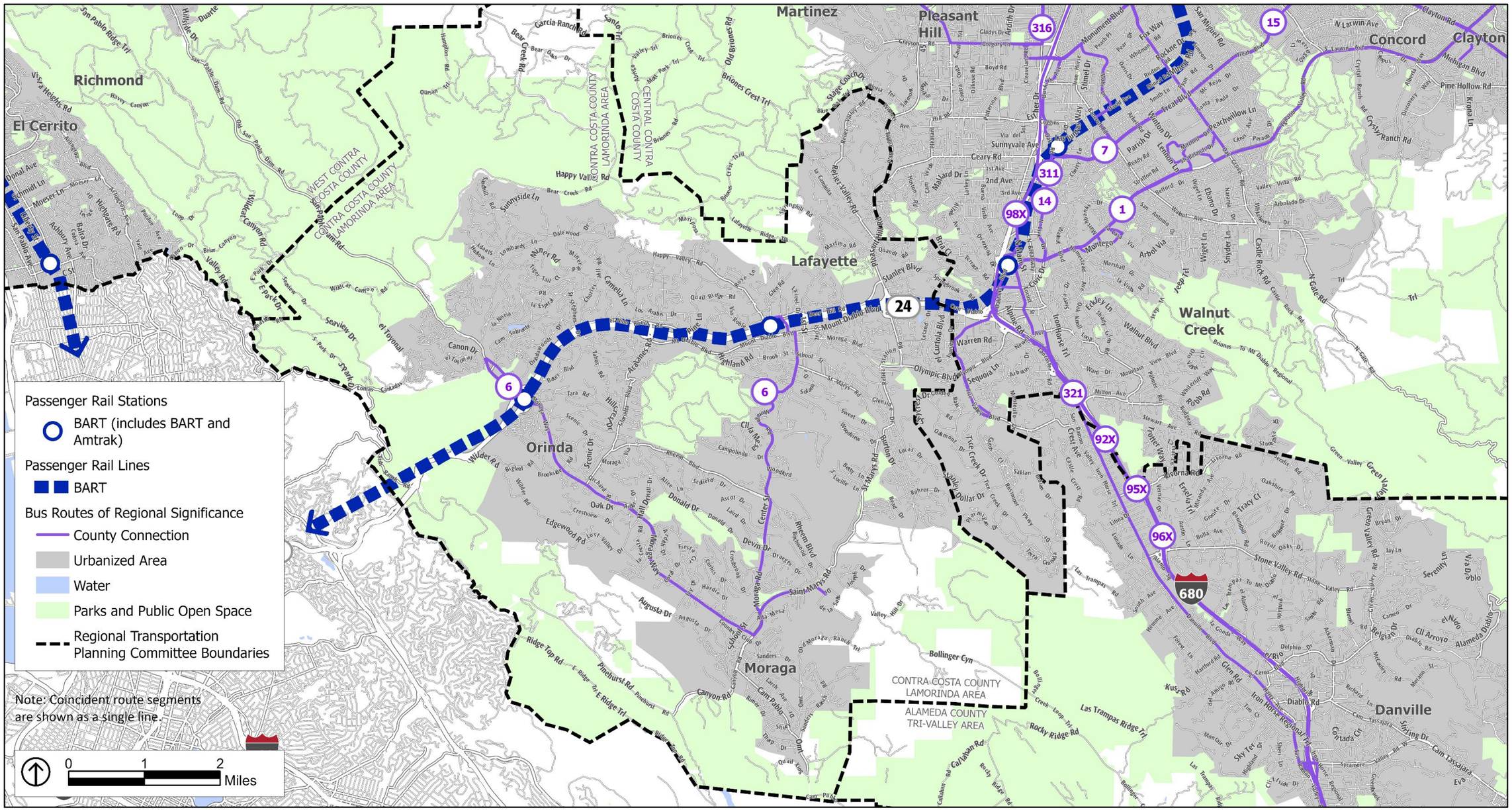
Transit in the Lamorinda area includes a variety of different providers, from multiple bus operators to passenger rail. Transit service also includes vital accessible transportation services through Americans with Disability Act (ADA)-mandated and non-ADA-mandated paratransit and community-based transportation programs for the elderly or residents with disabilities. Many of the routes and facilities vital to the Lamorinda transit system are shown on 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	20% commute trips 6% of all trips	27% of commute trips 12% of all trips
Transit RTO-2: Mode Share to/from BART	Increase mode share of people accessing BART with non-vehicle modes	None	25%	35%
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	5%	10%
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 the Lamorinda Area



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 Chapter 2, in 2019, 20 percent of Lamorinda area residents commuted to work using transit, compared to 12 percent of residents in Contra Costa County as a whole. These figures are projected to increase slightly to 21 percent and 13 percent, respectively, by 2050. Meanwhile, Table 2-4 indicates that around six percent of all Lamorinda trips (not strictly commute trips) were taken by transit in 2019, compared to four percent of all countywide trips.

The COVID-19 pandemic has greatly reduced transit trips, so this Action Plan includes a performance target for transit mode share in the Lamorinda area to return to pre-pandemic levels of 20 percent of commute trips by 2027. A further target for 2050 is to increase the level of commute transit trips to 27 percent by 2050. Further, this Action Plan proposes a target transit mode share of 12 percent of all trips by 2050. While these goals are ambitious, they are necessary 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 Lamorinda.

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 25 percent of BART riders in the Lamorinda area used non-vehicle modes to access BART stations in 2015, compared to 53 percent systemwide.

The performance target for this RTO is to restore Lamorinda's non-vehicle BART access modes toward pre-pandemic performance of 25 percent by 2027. For 2050, the goal is to increase the share by an additional 10 percent. This would result in a 35 percent non-vehicle mode share.

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 Lamorinda BART Stations (2015)

Station	Active Transportation	Transit	Total for Non-Vehicle Modes
Lafayette	28%	1%	29%
Orinda	20%	2%	22%
Total Lamorinda Area	**25%**	**1%**	**25%**
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 Peak Hour and Peak Direction Travel Time for Transit Compared to Automobile Travel Time for the Same Trip

This metric compares the peak period transit travel time on select corridors to the SOV travel time in the peak commute direction. The key corridor(s) monitored for the Lamorinda 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 quicker than driving between the Orinda and Montgomery Street BART stations in the morning westbound and afternoon eastbound directions. In 2050, the congested travel times predicted by the travel demand model will give transit an even greater advantage in this corridor (assuming BART service remains constant).

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
Orinda BART Station and San Francisco Montgomery Street BART Station					
Morning – Westbound	35:24	27	82:53	0.76	0.33
Afternoon – Eastbound	32:20	26	90:05	0.80	0.29

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 Orinda BART to San Francisco Montgomery 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[14] 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 5-4 illustrates areas within a quarter mile of high-quality transit access pre-pandemic. As shown, there are no pre- or post-pandemic high-quality transit bus lines operating in the Lamorinda area. However, the rail stations shown on Figure 5-4 operated pre-pandemic and continue to operate post-pandemic. Table 5-4 indicates that the pre and post-pandemic high quality transit constitutes 5 percent of Lamorinda's urbanized acreage.

[14] "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 non-residential urban land uses with low population density included to link outlying densely populated areas.

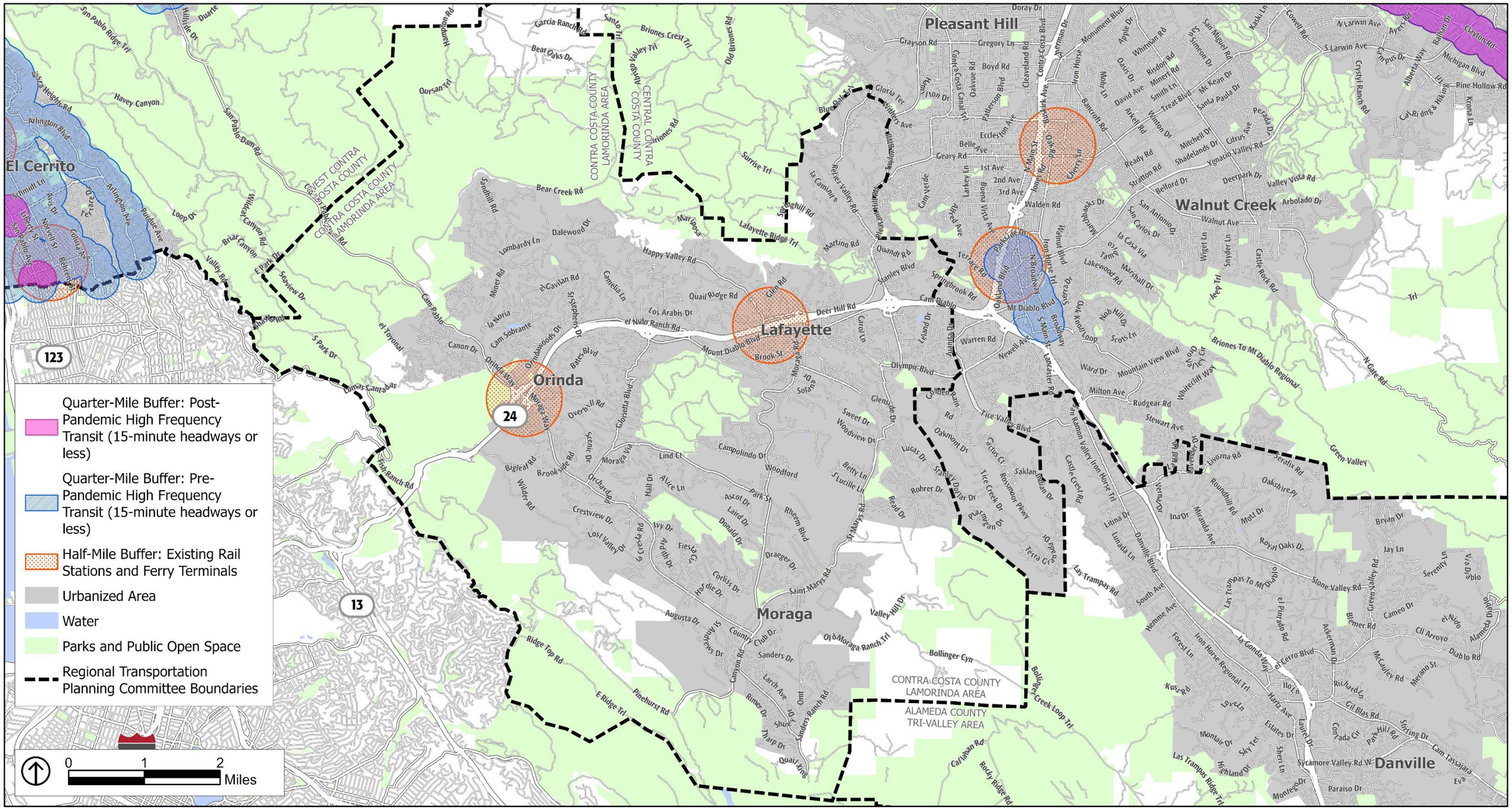
This Action Plan sets a target that the high-quality transit rail stations remain in operation through 2027, ensuring residents in the Lamorinda area being served by high-quality transit. Since some urbanized areas are too remote or have densities that are too low to support transit, it would not be realistic to set a goal that 100 percent of urbanized areas be served by high-quality transit in the coming decades. Therefore, this Action Plan sets a target that the proportion of urbanized land area in the subregion served by high-quality transit increase to 10 percent by 2050.

Table 5-4: Proportion of Urbanized Land in Lamorinda 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 bus transit	1,005	5%	1,005	5%
Total urbanized area in Subregion	21,882			

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: Lamorinda High-Quality Transit



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

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Transit RTO-5: Paratransit and Community-Based Transportation Programs Access[15]

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

This metric tracks annual rides from the six paratransit and other accessible transportation programs that conduct operations in a portion, or the entirety, of the Lamorinda area. 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 Lamorinda area providers should increase by five percent by 2027 to 346,610 rides, and by 20 percent by 2050 to 396,126 rides.

Table 5-5: Number of Calendar Year 2019 Rides Provided by Lamorinda Paratransit and Community Based Transportation Providers

Provider	2019 Rides
East Bay Paratransit [a,b]	115,740
County Connection LINK [a,b]	151,348
Visitability [b]	54,940
Mobility Matters [b]	3,374
Lamorinda Spirit Van	3,282
Seniors Around Town	1,421
Total Rides	**330,105**

a) These programs are ADA-mandated programs.

b) These providers operate in areas throughout Contra Costa County and therefore the number of rides includes all rides, not only those that in the Lamorinda subregion.

[15] CCTA, LPMC, and Lamorinda jurisdictions recognize that tracking paratransit rides is not a true measure of success when looking at countywide accessible transportation. For instance, several non-profits 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, LPMC, and Lamorinda 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. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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: Continue the augmentation and expansion of, and seek funding for, on-demand bus service (flex van) to BART stations and high-volume ridership locations.
- Transit-2: Improve transit access to BART throughout the county, including through.
  - Working with CCCTA to study feasibility of public transit service in the Pleasant Hill Road/Taylor Boulevard Corridor to connect to BART and to services in Lafayette.
  - Reduce bus headways on routes providing service to the Antioch/SFO BART line.
- Transit-3: Support CCTA and local public transit operators in:
  - Developing a Lamorinda Transit Plan to identify future community transit needs and set a shared vision for viable, sustainable public transit service for all.
  - Linking transit service in the entire subregion, including more directly to communities to the north and east of Lafayette and Orinda, between BART stations, between adjacent Central County communities, to Bishop Ranch and the Tri-Valley area, and through the Caldecott Tunnel.
  - Leveraging MTC's effort to standardize operations, regional mapping, and wayfinding.
- Transit-4: Work with CCTA, West Contra Costa Transportation Advisory Committee (WCCTAC), local jurisdictions, and all applicable transit agencies to explore the feasibility of service re-organization along the San Pablo Dam Road/Camino Pablo corridor to increase bus frequency, and to resolve transit stop access and amenity needs in the corridor.
- Transit-5: Support and seek funding for augmentation and, expansion, and continued operation of school bus service in Lamorinda.
- Transit-6: Seek funding to implement the recommendations of the Contra Costa Accessible Transportation Strategic Plan, including the establishment of a new Coordinating Entity and establishing a new, ongoing, and dedicated funding source.
- Transit-7: Collaborate with the Moraga School District, Orinda School District, Lafayette School District, and the Acalanes Union High School District to reduce auto trips and promote and increase ridesharing, use of transit, and bicycling and walking for travel to and from the public schools in Lamorinda.

- Transit-8: Work with CCTA and local transit operators to explore financial incentives and reduced fares for public transit, including a feasibility study to explore a subregional or countywide Universal Basic Mobility program.
- Transit-9: Provide educational awareness of public transit options through outreach, education, and advertising, particularly in local schools.
- Transit-10: 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-11: Work with local jurisdictions to develop intermodal transportation facilities (Mobility Hubs) that serve major activity centers and connect transit, pedestrian, bicycle facilities, and car/ride share in their planning documents, and site park and ride facilities, where appropriate.
- Transit-12: Complete a study to explore the feasibility of a regional Express Bus Program and expansion and enhancement of Bus Rapid Transit along transit corridors and RRS.
- Transit-13: 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-14: Assist local jurisdictions in reviewing and considering options for improving curb management and commercial and public bus, truck, and van passenger loading on key public streets.
- Transit-15: Adopt local policies that prioritize safety for the most vulnerable users at all stages of project planning and delivery.
- Transit-16: Work with CCTA and local transit providers to ensure real-time online transit information for all routes.
- Transit-17: 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-18: Work with CCTA and public transit agencies 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-19: Complete general improvements to BART stations to increase their use, including:
  - Pursue projects and programs that improve the passenger experience, such as, upgrade systems, modernize stations, and expand the passenger capacity of BART stations.
  - Continue to work with CCTA and local jurisdictions to improve circulation and prioritize walking, bicycling, and bus transit access near major transit stops and stations.
- Transit-20: 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-21: Work with CCTA and local transit providers to reinstate high-quality transit that operated in the subregion prior to the pandemic.

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Chapter 6: Active Transportation

Active transportation in Lamorinda 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 Lamorinda 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.

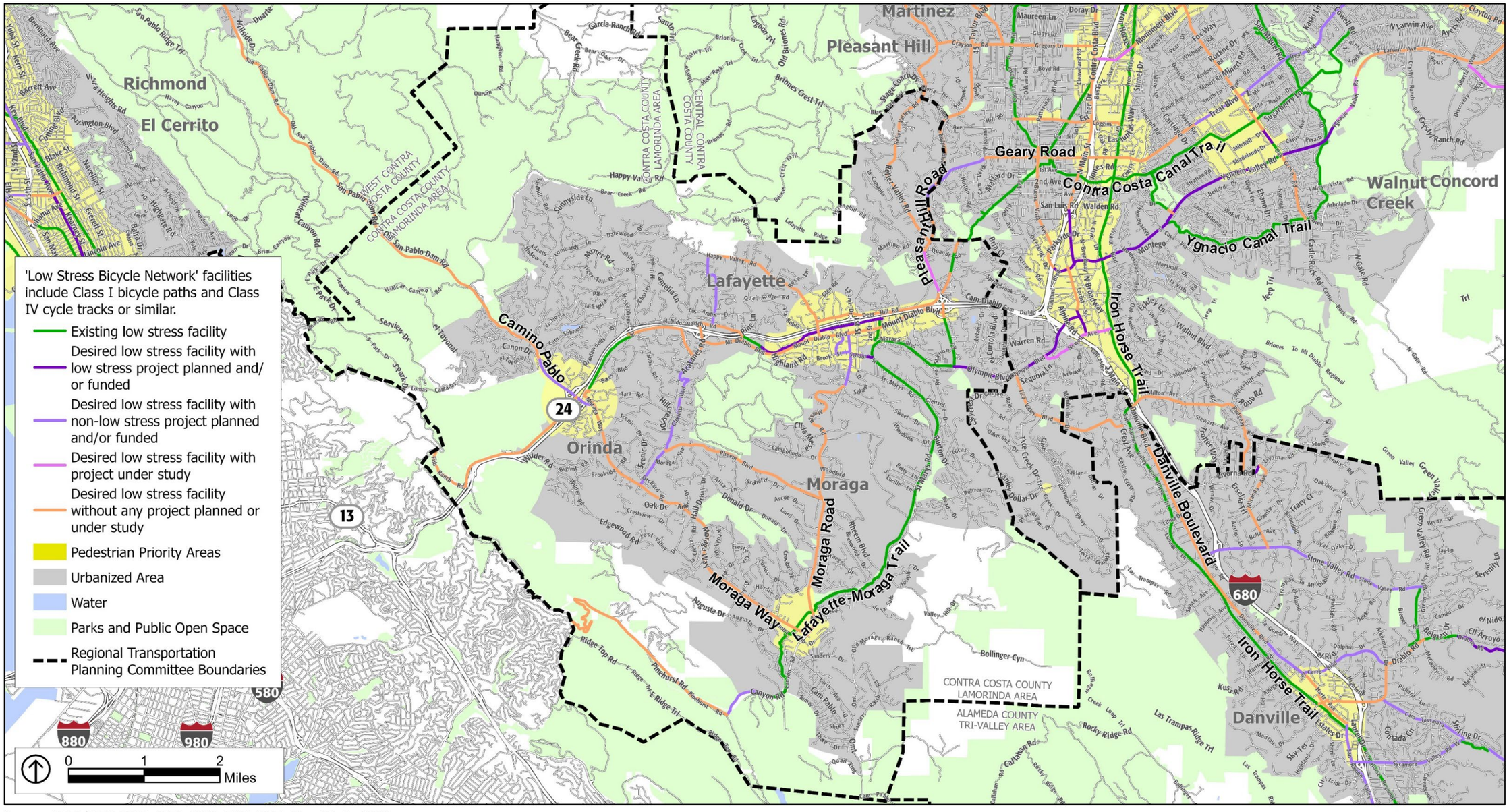
Table 6-1: Summary of Active Transportation Regional Transportation Objectives

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	5% all trips [a] 1% commute trips	8% all trips 3% for commute trips,
Active Transportation RTO-2: Low-Stress Bicycle Network	Increase completeness of the LSBN	None	28%	90%
Active Transportation RTO-3: Unprotected Trail Crossings	Eliminate unprotected crossings of the LSBN intersections with roadways	None	No unprotected crossings	No unprotected crossings

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

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

Figure 6-1: Lamorinda Low-Stress Bicycle Network



Source: ABAG/MTC, 2021; CCTA, 2021; 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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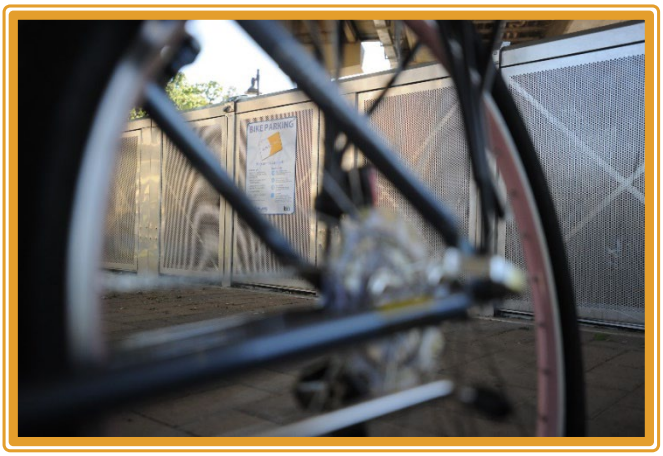
RTOs

Active Transportation RTO-1: Active Transportation Mode Share

Increase the Mode Share of Active Transportation in the Subregion

As shown in Table 2-2 in Chapter 2, in 2019, one percent of Lamorinda residents commuted to work through active transportation such as bicycling or walking. This is compared to 1.7 percent of countywide commute trips in 2019 through active transportation. These figures are expected to slightly change over time, decreasing to 0.9 percent of Lamorinda commute trips and increasing to 2.5 percent of countywide commute trips by 2050. As shown in Table 2-4, 5.3 percent of all trips (not strictly commute trips) were conducted by active transportation in 2019 with a projected decrease to approximately five percent in 2050. This is slightly lower than all countywide trips, at 6.5 percent of 2019 trips, projected to increase to seven percent in 2050.



This Action Plan includes active transportation mode share targets for the Lamorinda area that would see 2027 active transportation trips match pre-pandemic levels of one percent of commute trips and five percent of all trips. The 2050 target proposes an increase to eight percent of all trips and three percent of commute trips. These goals are ambitious but necessary to meet goals to 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 Lamorinda portion of the LSBN is shown on Figure 6-1. If the entire LSBN in the Lamorinda subregion were completed, it would have 53 miles of Class I, Class IIIB, or Class IV facilities.

Table 6-2 shows that 19 percent of Lamorinda's LSBN is constructed as of 2022. An additional five percent of low-stress facilities are incomplete but have a locally adopted plan to construct the facility toward a more contiguous countywide LSBN. There are projects proposing improvements that would not result in low-stress facilities on an additional 12 percent of the LSBN, and one additional percent is designated "under study." A total of 63 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 28 percent (15 miles) by 2027. This is the sum of existing completed facilities (19 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 Lamorinda LSBN Completed (2022)

Status of Facility	Miles	Percentage
Existing Low-Stress Facility	10	19%
Desired Low-Stress Facility with Low-Stress Project Planned and/or Funded	3	5%
Desired Low-Stress Facility with Non-Low-Stress Project Planned and/or Funded [a]	6	12%
Desired Low-Stress Facility with Project Under Study	0.6	1%
Desired Low-Stress Facility without any Project Planned or Under Study	34	63%

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 Makes an Unprotected Crossing of a Heavily Traveled Vehicle Route

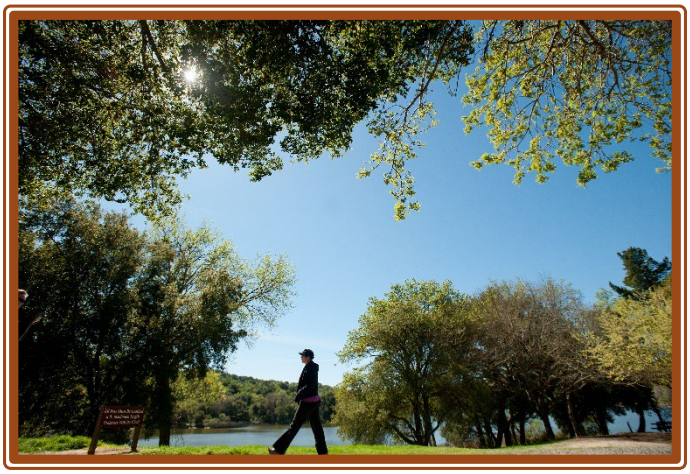
This metric maps and tracks the status of intersections between the LSBN and heavily traveled roadways,[16] as illustrated on Figure 6-2. The level of protection at each intersection is classified as:

- **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 no study intersections in the Lamorinda area that are currently unprotected and there are two that are considered semi-protected. The semi-protected intersections are:

- Lafayette Moraga Regional Trail crossings with:
  - Canyon Road at Valley Vista Staging Area
  - Rheem Boulevard and St Mary's Road

This Action Plan sets a target to modify the two semi-protected intersections to become fully protected by 2027. 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 the locations listed and shown on Figure 6-2.



[16] 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.

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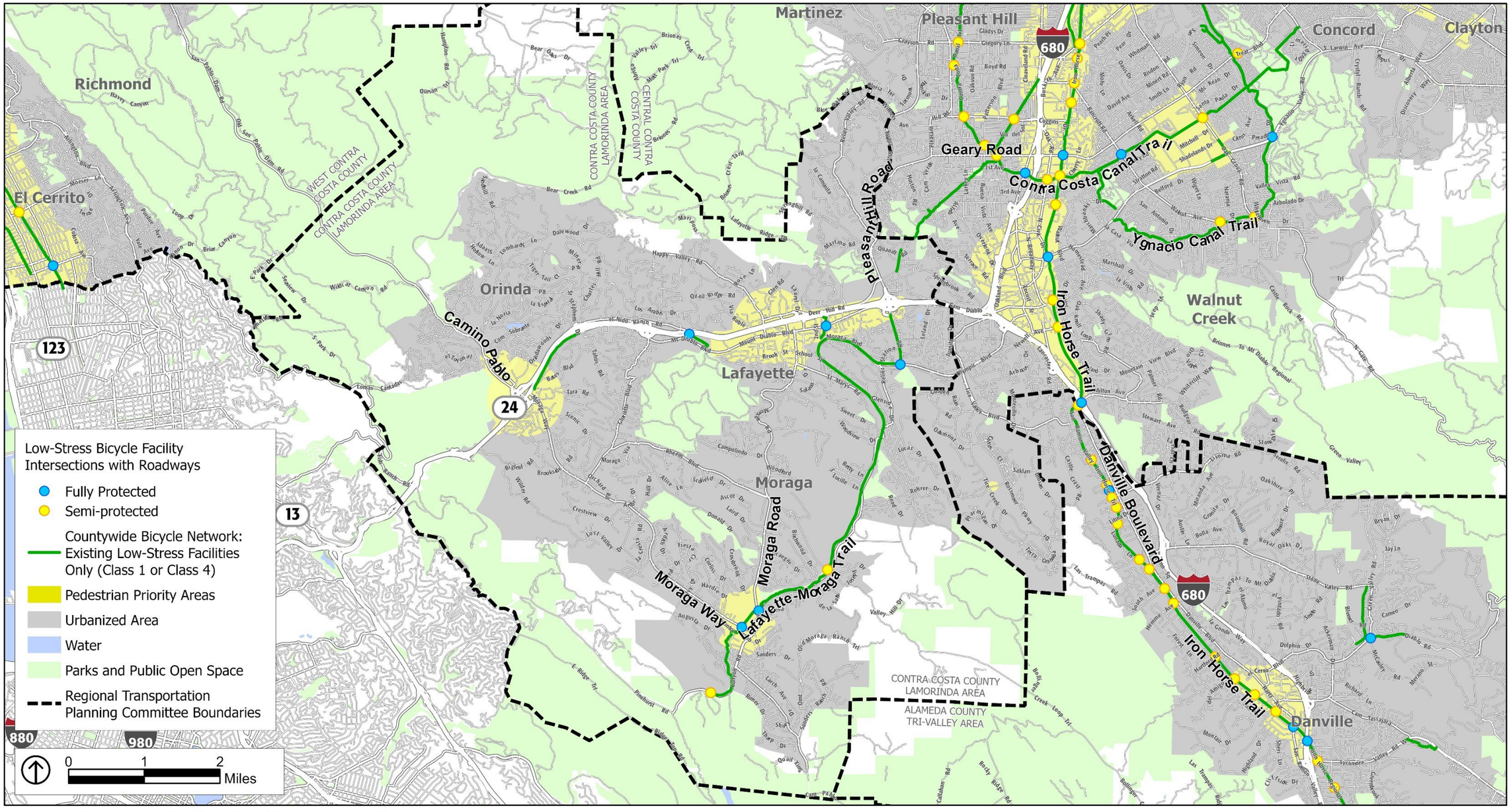
Figure 6-2: Status of Crossings at Intersections of the LSBN and Heavily Traveled Roadways



Source: ABAG/MTC, 2021; 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. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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 adopt and update 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 with emphasis on Safe Routes to School, Safe Routes to Transit, and the downtown.
- Active Transportation-2: Explore the feasibility of widening existing pedestrian/bicycle facilities, including improvements to school streets where feasible, to accommodate demand and improve safety.
- Active Transportation-3: Seek funding to provide bicycle parking infrastructure at employment sites and activity centers throughout Lamorinda.
- Active Transportation-4: Install bicycle facilities as part of any future roadway improvements as feasible, and to complete gaps in the bicycle network, with an emphasis on protected facilities over unprotected facilities.
- Active Transportation-5: Make the following Improvements to the Lafayette-Moraga Regional Trail:
  - Crossings improvements at high traffic volume crossings.
  - Work with East Bay Municipal Utilities District (EBMUD) and East Bay Regional Parks District (EBRPD) to reopen the trail near August Drive between School Street Bridge and Canyon Road Bridge.
- Active Transportation-6: 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-7: Implement a Safe Routes to School Program to evaluate and encourage safety improvements for multimodal transportation and access to and from schools.

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-8: Work with local jurisdictions to promote 511 Contra Costa's active transportation programs that increase educational awareness of multimodal travel options, travel behavior incentives, and safety through outreach, events, education, social media, marketing, and advertising.
- Active Transportation-9: Construct gap closure projects in the countywide LSBN to establish a safe and contiguous network, including, but not limited to:
  - Wilder Road to Moraga Way
  - Moraga Way between Moraga Road and Orinda BART[17]
- Active Transportation-10: Support CCTA 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 County residents.
- Active Transportation-11: Work with CCTA, EBRPD, and other public facilities management agencies to develop a method of tracking the Pavement Condition Index (PCI) of bicycle facility segments along the LSBN and implement rehabilitation, repair, and replacement modifications improvements where and as needed.
- Active Transportation-12: Construct bicycle and pedestrian crossing improvements at the following intersections:
  - St. Mary's Road and Rheem Boulevard where the intersection improvements are limited to a painted crosswalk and stop sign along Rheem Boulevard.
  - Lafayette-Moraga Regional Trail crossing at Canyon Road where the intersection improvements are limited to a painted crosswalk.
- Active Transportation-13: Implement micromobility recommendations from the Countywide Bicycle and Pedestrian Plan, including those related to ordinances and request for proposals (RFPs), and work with operators to deploy micromobility systems, built off industry best management practices.
- Active Transportation-14: Develop a plan that supports transportation infill development though the construction and funding of a bicycle and pedestrian bridge over SR-24 that connects the two sides of Downtown Orinda with each other and with the Orinda BART Station and construct this bridge when feasible.
- Active Transportation-15: Work with local schools to prepare school enrollment maps that show where students live in relation to school and use this information to develop programs that encourage walking and bicycling and discourage driving, such as remote drop-off zones, carpools, and parking restrictions for nearby students.
- Active Transportation-16: Work with CCTA to conduct, update, and implement a comprehensive countywide Pedestrian Needs Assessment.
- Active Transportation-17: 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.

[17] This route could also serve as a motorized vehicle emergency evacuation route, if needed.

- Active Transportation-18: Work with CCTA, County staff, and Walnut Creek staff to implement the Olympic Connector Project.

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Chapter 7: Roadways

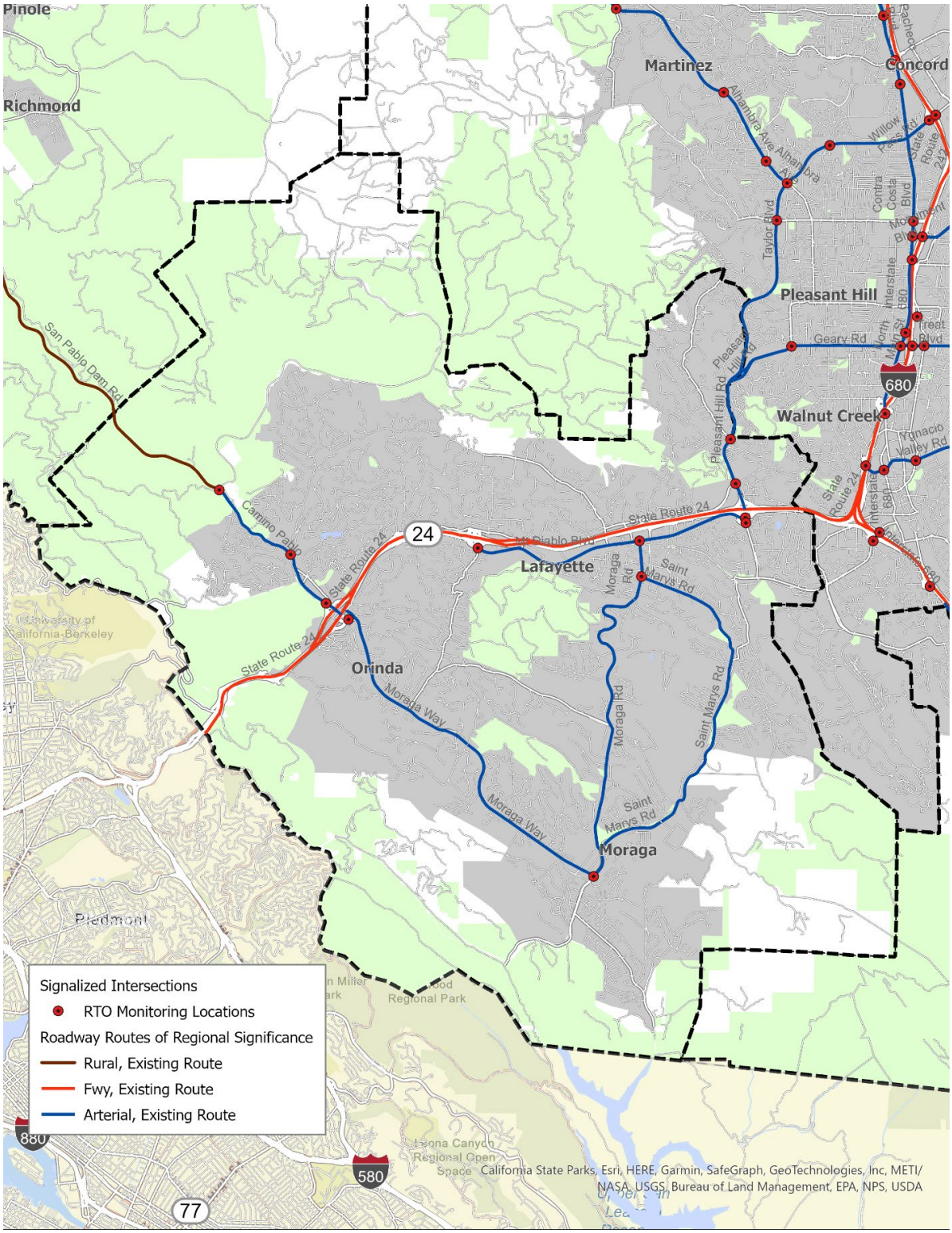
The transportation system in Lamorinda, much like the rest of the United States, is built for and around the automobile. While non-automobile modes can use them, roadways are primarily geared to the personal automobile and vehicle traffic. This Action Plan monitors the roadway and vehicles to ensure service on Lamorinda roadways is adequate. However, it is the intention of this Action Plan that the share of personal automobile travel decreases, particularly SOVs, and that Lamorinda 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 Lamorinda 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	Delay index: ≤2.0	Delay index: 3.0	Delay index: 3.0
Roadways RTO-2: Freeway Buffer Index	Maintain current buffer index	Buffer index: None	Buffer index: 0.5	Buffer index: 0.5
Roadways RTO-3: Intersection Level of Service (LOS)	Maintain LOS at RTO monitoring locations	Side street delay, no intersection LOS except for LOS "Good D" on Pleasant Hill Road outside of downtowns and at gateway areas	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) , except on Pleasant Hill Road strive to maintain current v/c of 1.06 in the AM peak period and 1.36 in the PM peak period	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, except on Pleasant Hill Road strive to maintain current v/c of 1.06 in the AM peak period and 1.36 in the PM peak period
Roadways RTO-4: Roadway Segment LOS	Maintain LOS on two-lane roadways outside of urban areas	None	LOS E (≤40 miles per hour [mph])	LOS E (≤40 mph)

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



Freeway RTOs

Freeway RRS in the Lamorinda subregion includes SR-24 from the Caldecott Tunnel to I-680.

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, the observed delay index for existing conditions is high in the a.m. westbound direction and p.m. eastbound direction. The modeled condition for 2050 generally shows an increase in delay index for SR-24 to 3.2 and 2.6, respectively.

Based on current performance and the future modeled performance, this Action Plan sets a delay index target of 3.0.

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 0.5 to 0.73, reflecting a high degree of travel time variability, especially in the morning westbound direction.

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 in the Lamorinda area.

- For an AM peak trip from the Orinda BART station to the Montgomery station in San Francisco, the average trip time is 27 minutes, while 95 percent of trips occur in 30 minutes or less. This means that the buffer time for this BART trip is only three minutes in addition to an average trip time of 27 minutes, which represents a buffer index of 0.11 (3 ÷ 27).
- For a PM peak trip from the Montgomery station in San Francisco to the Orinda BART station, the average trip time is 26 minutes, while 95 percent of trips occur in 29 minutes or less (one minute less than in the AM peak time). This means that the buffer time for this BART trip is three minutes in addition to an average trip time of 26 minutes, which represents a buffer index of 0.11 (3 ÷ 26).

These buffer indexes for BART are better than 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	
	Avg Speed (MPH) [a]	Delay Index	Buffer Index	Avg Speed (MPH) [a]	Delay Index
State Route 24					
A.M. Eastbound	67.6	0.96	0.08	56.3	1.2
A.M. Westbound	38.1	1.71	0.73	20.6	3.2
P.M. Eastbound	30.1	2.16	0.50	24.6	2.6
P.M. Westbound	66.4	0.98	0.08	49.35	1.3

a) MPH = Miles per hour; Average speed over corridor as a whole.

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.[18] The

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

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.[19]

In some cases, a volume to capacity (v/c) ratio is used in place of LOS, although they are similar. A v/c ratio measures the amount of traffic on a given roadway relative to the amount of traffic the roadway was designed to accommodate. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected. Table 7-3 shows the relationship between v/c ratio and LOS. A v/c ratio is used in lieu of LOS for only the Pleasant Hill Road segment in the Lafayette area, which is reflected in Table D-1 in Appendix D, Transportation Modeling Results.

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 Lamorinda 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, except on Pleasant Hill Road strive to maintain current v/c of 1.06 in the AM peak period and 1.36 in the PM peak period.

[19] As described previously, 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.

Table 7-3: Intersection LOS Definitions

Traffic State and Condition	Level of Service (LOS)	V/C Ratio
Free flow	A	0 to 0.60
Stable flow with unaffected speed	B	0.61 to 0.70
Stable flow but speed is affected	C	0.71 to 0.80
High-density but stable flow	D	0.81 to 0.90
Traffic volume near or at capacity level with low speed	E	0.91 to 1.0
Breakdown flow	F	>1.0

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 the 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 Lamorinda subregion, this metric is applied only to San Pablo Dam Road from the West County RTPC Boundary to Wildcat Canyon. The segment LOS is related to average speed, as shown in Table 7-4. Table 7-5 lists the analysis results for the two-lane roadway corridor studied for the Lamorinda subregion and reports the existing and forecast LOS. The observed average speed for 2019 conditions varies between 25.4 and 46.7 miles per hour (mph) eastbound in the A.M. and P.M. and between 47 and 45.9 mph westbound in the A.M. and P.M. These speeds equate to LOS E and C, respectively. The only occurrence of LOS E is on the morning eastbound direction. The modeled average speed for 2050 is predicted to slow below 40 mph in both directions and time periods.

This Action Plan sets a performance target for this metric is 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 to 45 mph. This is within the 45 mph speed limit already set on San Pablo Dam Road.

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 2010, 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	25.4	E	25.4	E
San Pablo Dam Road	A.M.	WB	47.0	C	39.8	E
San Pablo Dam Road	P.M.	EB	46.7	C	39.8	E
San Pablo Dam Road	P.M.	WB	45.9	C	32.7	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 Plan, the CTP, and other regional long-range planning documents with shared priorities. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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, traffic-calming measures, auxiliary lanes) on freeways, at intersections, and on roadway segments that are needed to maintain the RTOs in this Action Plan, while ensuring balancing these improvements against the objectives and actions regarding other modes and issues covered by this Action Plan.
- Roadways-2: Work with TRANSPAC, WCCTAC, and local jurisdictions to develop a program to discourage diversion from freeways and cut-through travel on surface roadways.
- Roadways-3: 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, high-occupancy vehicle (HOV)/high-occupancy toll (HOT) lane and bypass lanes, and others to support a cohesive transportation system for all modes.
- Roadways-4: Work with CCTA, TRANSPAC, WCCTAC, and local jurisdictions to implement HOV/HOT and transit improvements along freeway corridors to reduce single occupant automobile use and increase ride-sharing and transit.
- Roadways-5: 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-6: Continue studying the feasibility of pilot and long-term programs for bus on shoulder on SR-24.
- 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: Conduct Integrated Corridor Management (ICM) studies for the SR-24 corridor to improve multimodal function of countywide facilities.
- Roadways-9: Work with CCTA, Caltrans, and California Highway Patrol to develop a program to track HOV/HOT and toll lane violators.
- Roadways-10: Complete needed projects on SR-24 to maintain targeted delay and buffer index goals without increasing traffic in downtowns or residential neighborhoods.
- Roadways-11: Seek and secure funding to implement the Lafayette Downtown Congestion Study to get Lamorinda trips to and from SR-24.
- Roadways-12: Coordinate and improve procedures of Lamorinda agencies for detecting, reporting, announcing, and documenting lane or road closures.
- Roadways-13: Improve coordination of Lamorinda procedures/practices for traffic management during lane or road closure.
- Roadways-14: Work collaboratively to reduce the incidence of road closures, including due to construction activities, replacing or reconstructing underground utilities, and ensure vegetation and drainage facilities are maintained to reduce potential interference with traffic flow.
- Roadways-15: Develop subregional corridor management plans for Moraga Road, Moraga Way, Camino Pablo, San Pablo Dam Road, and Pleasant Hill Road, to provide adequate roadway capacity for local and subregional travel while also including both public and active transportation modes and nonmodal transportation issues, such as equity, climate change, safety, and technology. Plans on evacuation routes should also address long-term emergency evacuation.
- Roadways-16: Investigate appropriate mechanisms, including maintaining existing roadway lanes and widths and restrictive signal timing and metering, to discourage use of arterial roads as a substitute for freeway travel.
- Roadways-17: 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-18: Explore opportunities to work with TRANSPAC to develop a traffic management program to discourage use of Pleasant Hill Road as a detour to traffic north of SR-24 to bypass the I-680 SR-24 interchange.
- Roadways-19: Work with relevant partner agencies to conduct long term Lamorinda 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 affects each person that lives, works, or recreates in Lamorinda, 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 Lamorinda, 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." 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).[20] 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 includes January 1, 2016, through December 31, 2019. CCTA and the Lamorinda 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.

Safety RTO-1: KSI Collisions

Eliminate Killed or Severely Injured 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.[21] This RTO includes all collisions that occur in the subregion and not

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

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

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 68 severe injury or fatality collisions throughout Lamorinda area—eight fatal collisions and 60 severe injury collisions. The most common types of collision were cars hitting objects followed by sideswipe collisions.

Safety RTO-2: Active Transportation Collisions

Eliminate Collisions in the Subregion that Involve Users of Active Transportation

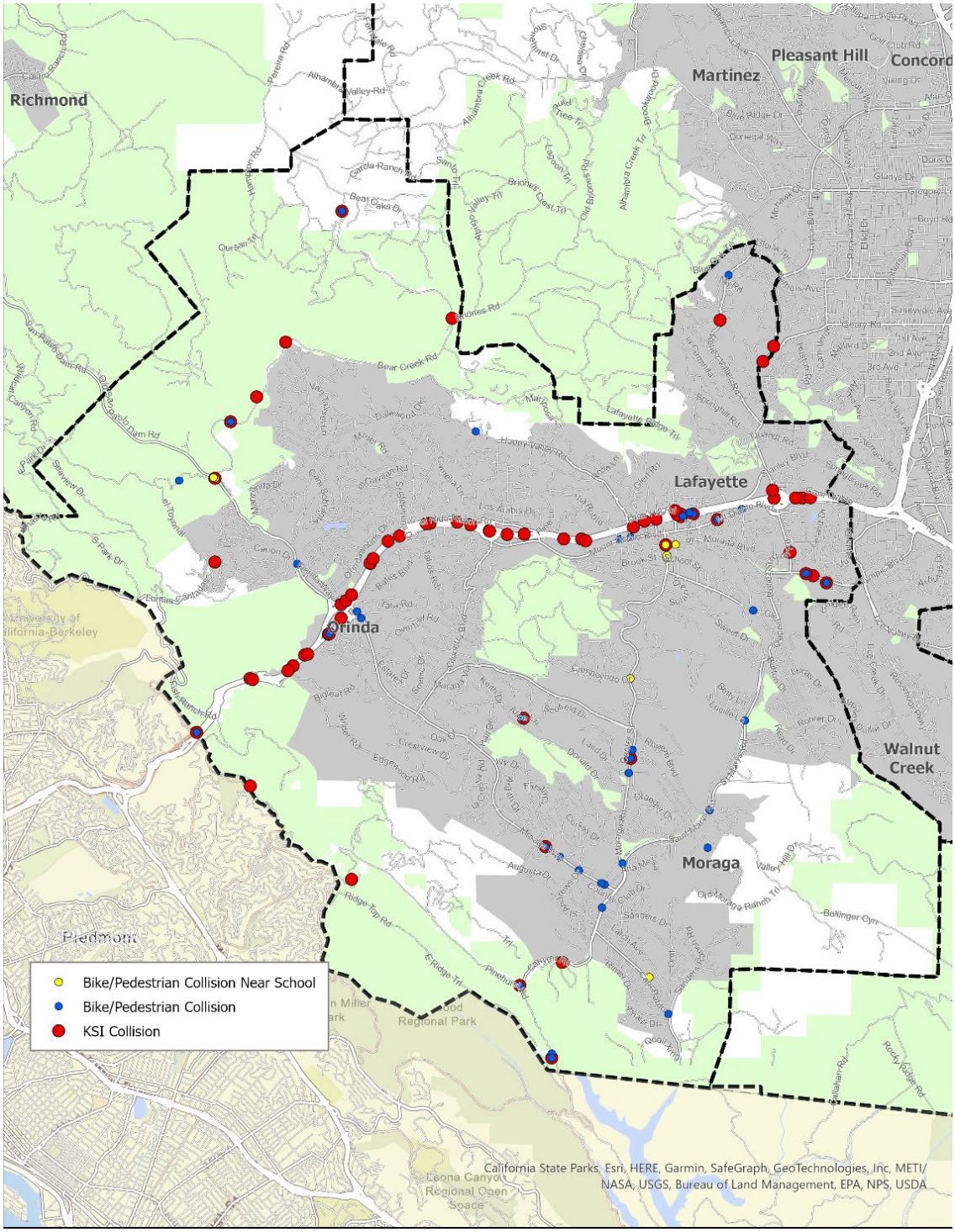
This RTO tracks the number of active transportation-involved collisions from the TIMS data set. The collision locations for the Lamorinda subregion are depicted on Figure 8-1 and summarized by severity in Table 8-3. Between 2016 and 2019, there were 51 active transportation-involved collisions, accounting for seven percent of all injury and fatality collisions. Of the active transportation collisions, one resulted in a fatality and 13 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 nine collisions occurred near school campuses, five of which involved collision with a pedestrian and four with a bicyclist, including one fatal collision.

Figure 8-1: KSI and Active Transportation-Involved Collisions (2016-2019)[22]



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

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

Collision Type	2016	2017	2018	2019	Number of Collisions
Not Stated	1	0	0	0	1
Head-On	0	0	0	3	3
Sideswipe	2	3	4	2	11
Rear-End	2	1	1	5	9
Broadside	0	1	1	2	4
Hit Object	5	7	8	6	26
Overturned	1	1	3	3	8
Vehicle/Pedestrian	1	2	0	1	4
Other	1	0	1	0	2
Total	**13**	**15**	**18**	**22**	**68**

Source: Transportation Injury Mapping System and DKS Associates.

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

Severity of Injury	2016	2017	2018	2019	Total Active Transportation Collisions
Fatal	0	1	0	0	1
Injury (Severe)	2	3	3	5	13
Injury (Other Visible)	5	5	0	7	17
Injury (Complaint of Pain)	4	8	2	6	20
Total	**11**	**17**	**5**	**18**	**51**

Source: Transportation Injury Mapping System and DKS Associates.

Actions

The following Actions are necessary 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. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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 to increase the level of multimodal public awareness and empathy about bicycle and pedestrian safety and to reduce injuries due to vehicle-involved collisions.
- Safety-2: Implement the following to monitor traffic speeds in Lamorinda:
  - Monitor and evaluate traffic speed and other safety issues, particularly around schools, on an annual basis.
  - Seek to reduce the speed limit on Taylor Boulevard to improve safety around the elementary and high schools and at the southbound approach to Pleasant Hill Road.
  - Use technology to increase multimodal traffic safety to slow vehicle speeds and reduce the severity of collisions.
  - Install speed cameras in areas where enhanced speed enforcement is needed.
- Safety-3: Work with CCTA to coordinate the collection and analysis of safety data, identify areas of concern, and propose safety-related improvements and user awareness to support countywide, state, and federal safety programs and performance measures.
- Safety-4: Work with CCTA to implement the Countywide Vision Zero Framework and Safe System Approach to project scoping and delivery.
- Safety-5: Prepare an incident management plan for SR-24.
- Safety-6: Continue to identify all safety-related transportation improvements needed within 500 feet of schools.

Project Highlight!

The 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: Work with CCTA, MTC, and 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.
- Safety-8: Encourage local jurisdictions to complete a Local Road Safety Plan.
- Safety-9: Support funding of a Safe Routes to School Program.

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Chapter 9: 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. Lamorinda jurisdictions understand that the impacts that the transportation system has on the climate is multi-faceted and should be addressed through a broad mixture of objectives beyond climate change-specific objectives in this chapter. Refer to the other topic chapters in this Action Plan for objectives that will have a positive adverse impact on climate change. See Table 9-1 for a summary of climate change RTOs.

Table 9-1: 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	65% for commute trips	50% for commute trips
Climate Change RTO-2: Carpool Mode Share	Increase carpool mode share	None	13% for commute trips	20% for commute trips
Climate Change RTO-3: Vehicle Miles Traveled	Decrease daily VMT per service population	None	30.4 VMT daily per service population	27.2 VMT daily per service population
Climate Change RTO-4: Greenhouse Gas (GHG) Emissions	Decrease GHG emissions per capita	None	29 lbs per capita	Zero transportation related
Climate Change RTO-5: Zero-Emission Vehicles	Increase registered electric vehicles	None	50% total market share	100% 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, 65 percent of total Lamorinda work trips were by SOVs in 2019, compared to 72 percent of total Contra Costa County work trips. These figures are predicted to slightly decrease on their own through 2050, to 64 and 70 percent, respectively. Meanwhile, Table 2-4 indicates that 64 percent of all Lamorinda trips and 63 percent of all countywide trips were taken by SOV in 2019, with these figures projected to remain the same through 2050.

This Action Plan sets a performance target that SOV work commute mode share in the Lamorinda subregion should match that of the pre-pandemic conditions—to 65 percent by 2027 and further decrease to 50 percent in 2050. These numbers have been derived by reducing future SOV mode share by the targeted increases in transit and active transportation mode share, and by assuming an increase in carpooling (multiple-occupant vehicle) mode share to 20 percent.

Climate Change RTO-2: Carpool Mode Share

Increase the Mode Share of Carpooling in the Subregion

As discussed previously, reducing SOV mode share will require increases in the other modes, including carpooling. As shown in Table 2-2 in Chapter 2, 13 percent of total Lamorinda commute trips were by carpool, compared to 14 percent of countywide commute trips. These figures are projected to slightly increase by 2050 to 13 and 15 percent, respectively. This Action Plan sets a target to match the 2019 base year carpool commute trips of 13 percent by 2027 and to increase the share of carpool commute trips to 20 percent by 2050.

Climate Change RTO-3: Vehicle Miles Traveled

Reduce Vehicle Miles Traveled 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 Lamorinda subregion was 32, and for Contra Costa County it 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*[23] 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, this Action Plan sets a goal for 2050 to reduce VMT per service population to 21 VMT per service population in the Lamorinda area. Using a straight-line projection for reductions from 2018 to 2050, this would mean a reduction to 30.4 VMT per service population by 2027.

Table 9-2: VMT per Service Population

	2018 Existing	2027 Target	2050 Target
Lamorinda area	32	30.4	21
Contra Costa County	30.3		

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

Climate Change RTO-4: Greenhouse Gas Emissions

Reduce Transportation Greenhouse Gas Emissions per Capita in the Subregion

This metric reflects the total daily VMT occurring on roadways within the Lamorinda 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

[23] 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.

this total daily roadway VMT into GHG emissions (specifically, carbon dioxide [CO_2]).[24] 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 44 pounds of GHG per capita, this translates to a 2027 target of about 29 pounds per capita. Although transportation-related CO_2 emissions are projected to fall by 2050 (see Table 9-3), more work is needed to reach the target of zero.

Table 9-3: 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)
Lamorinda area	61,806	1,370	44.33	90,085	866	19.22
Contra Costa County	1,148,922	13,734	23.91	1,545,776	8,738	11.31

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

a) 2050 data in this table reflect projected CO2 emissions in 2050 assuming that the Action Plan is not implemented.

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 9-4 for Lamorinda as well as all of Contra Costa County for comparison. Lamorinda currently has 3,141 EVs, making up 6.1 percent of total registered vehicles in the subregion.

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.[25] As of December 2022, 12.4 percent of new

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

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

vehicles sold in California are ZEV, and ZEVs make up about two 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.[26] Since Lamorinda accounts for about less than 0.2 percent of the state's population, this suggests that the subregion should have about 1,600 ZEVs by 2025 and 7,900 ZEVs by 2030. A straight-line extrapolation of this number through 2050 suggests about 40,000 ZEVs in Lamorinda by 2050.

With all these 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 Lamorinda area is about 52,000.

Table 9-4: Electric Vehicles by Subregion as of April 2021

Area	Battery Electric Vehicles [a]	Total Vehicles	Percentage Battery Electric
Central County	4,879	247,807	2.0%
East County	2,926	264,910	1.1%
Lamorinda	3,141	51,896	6.1%
Tri-Valley [b]	15,262	315,590	4.8%
West County	4,258	217,792	2.0%
Countywide Total	30,466	**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.

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

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

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

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

Actions

The following Actions are needed to achieve the RTO targets and to implement other goals and policies of this Plan, the CTP, and other regional long-range planning documents with shared priorities. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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.

- Climate Change-1: Encourage "green" travel, including Zero Emission Vehicles and New Energy Vehicles, clean fuel infrastructure and car sharing.
- 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: Work with regional agencies, local employers, and schools to increase remote work opportunities, compressed work weeks, alternative work locations, and flex schedules, and provide pretax employer transportation benefit programs.
- Climate Change-4: Work with 511 Contra Costa and local jurisdiction Transportation Demand Management Advisory Councils to expand Transportation Demand Management (TDM) programs, adopt local TDM plans, and conduct regular monitoring and reporting for program effectiveness.
- Climate Change-5: Continue to promote EV ownership by offering financial incentives and providing educational programs and demonstrations.
- Climate Change-6: Adopt local policies that prioritize mobility for GHG-reducing modes of transportation.

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.

Chapter 10: Innovation and Technology

As discussed in Chapter 2, innovation and technology, coupled with current projects and programs, will reduce congestion, improve air quality, and provide new mobility options for all Lamorinda residents. RTOs and actions in this chapter are created to ensure that CCTA and Lamorinda jurisdictions are leveraging various transportation technologies and will adopt new ones as they emerge to ensure the region stays at the forefront of technological innovation in the transportation system. New technology can be difficult to track because there are so many unknowns, so this Action Plan only includes one Innovation and Technology RTO (see Table 10-1). However, several actions are in this chapter to ensure that innovation and technology are key components of the work that will be implemented for the Action Plan, with the ultimate goal of expanding Innovation and Technology RTOs in the next Action Plan update.

Automated Vehicles

Although it is not yet available to all consumers, full vehicle autonomy could increase safety by removing human error that can lead to a collision and by detecting an oncoming threat faster than a human. Other anticipated benefits of automated vehicles are increased accessibility for underserved communities, reduced demand for parking space when used for shared mobility, and reduced traffic through improved communication technology like Connected Autonomous Vehicles (CAVs).

Table 10-1: 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

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.

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

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 Lamorinda's jurisdictions to interconnect selected signals in Lafayette, Moraga, and Orinda, and in unincorporated Contra Costa County portions of the Lamorinda area, 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 Plan, the CTP, and other regional long-range planning documents with shared priorities. As noted in Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions depends on availability of funding and staff resources. 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 Lamorinda jurisdictions. 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: Interconnect the Lamorinda 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 the county and the subregion
  - Connection to shared mobility hubs
  - High traffic volume
- Innovation and Technology-2: Examine the feasibility of implementing a pilot Automated Driving System or other modal technologies (such as an autonomous bus/shuttle) somewhere in the Lamorinda area.
- Innovation and Technology-3: Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.
- Innovation and Technology-4: Coordinate with CCTA and local jurisdictions to identify solutions to the Intelligent Transportation System (ITS) communications needs during the development and implementation of a Regional ITS Communications Plan and/or regional communications infrastructure, including expanding fiber to link all traffic signals and bolster communications for signals, etc.
- Innovation and Technology-5: Work with CCTA to determine a method for tracking the availability of EV charging stations.

- Innovation and Technology-6: 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-7: Improve the safety of high-incident local roadways through physical changes, signage, technology, education, enforcement, or other tools.
- 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 11: 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 jurisdictions 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. As noted in Chapter 1, this Action Plan constitutes a work program for LPMC, CCTA, and its member agencies, with many Actions to be completed by outside agencies, such as Caltrans and BART. Completion of individual Actions is dependent on availability of funding and staff resources. The Actions listed in this plan do not commit CCTA, LPMC, or local jurisdictions to completing Actions within a specific timeframe. It is possible that some Actions will not be completed, and there is no penalty to

any jurisdiction for inability to complete an Action. 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.

Subregional Transportation Mitigation Program

In August 1994, the LPMC adopted the Lamorinda Transportation Improvement Program (LTIP) as its blueprint for transportation planning through the year 2010. According to the statutory requirements of Measure C, the LPMC must adopt a subregional traffic mitigation program to ensure that new growth is paying its share of the costs associated with that growth. The CCTA established in April 15, 1998, as the deadline by which all Contra Costa County jurisdictions must adopt a fee to remain in compliance with the GMP and continue receiving return to source funds from CCTA.

The LTIP is the result of the Lamorinda Traffic Study completed in late 1994. It identified roughly 37 improvements to regional roadways and transit facilities and totals approximately $17.7 million (in 1998 dollars). The LPMC then created the Lamorinda Transportation Impact Fee (LTIF) as a mechanism to charge new development to mitigate the traffic impacts it creates. Annual revenues generated as part of the transportation and traffic impact fees among all three Lamorinda jurisdictions range annually but are approximately $230,000 per year.

Actions

- Financial-1: Continue to participate in annual updates of the Lamorinda Transportation Impact Fee (LTIF) structure 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.

Chapter 12: Procedures for Notification, Review, and Monitoring

Action Plans are required to include a set of procedures to share environmental documents, review GPAs, 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 (this Lamorinda Action Plan and the Tri-Valley Action Plan).

In addition to their responsibilities for preparing and updating the Action Plans, the RTPCs are involved in various transportation planning efforts. Central Contra Costa Transportation Committee, also known as the Transportation Partnership and Cooperation committee (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. 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

As part of the GMP, local cities and towns are required to notify neighboring jurisdictions regarding proposed projects and GPAs. By agreement among the three cities within Lamorinda, the following notification procedures shall be followed:

- For any GPA, the lead jurisdictions shall notify the Lamorinda jurisdictions' staff and the designated staff person for LPMC as soon as the GPA application is deemed complete.
- For any proposed project that generates more than 10 and less than 50 NNPHVTs in either the AM or PM peak hour, the lead jurisdictions shall notify the planning directors of the other Lamorinda jurisdictions as soon as the development application is deemed complete. No additional actions are required, unless the proposed development is subject to CEQA, in which case, the CEQA-related notification procedures apply as outlined here.
- For proposed projects that would generate 50 or more NNPHVTs, the Lamorinda jurisdictions agree to the following procedure:
  - The Lead Agency shall notify the planning directors of the other Lamorinda jurisdictions and the designated staff liaisons for LPMC.
  - Following receipt of notification, any Lamorinda jurisdiction may request, and the sponsoring jurisdiction shall agree to, an informational meeting to discuss the application.
- If the project generates more than 100 NNPHVTs, the Lead Agency shall in turn notify the designated staff person for SWAT, the staff of other jurisdictions within SWAT, and adjacent RTPCs as appropriate so that affected jurisdictions may comment on proposed projects and subsequent environmental documentation.[27]

When these development projects and GPAs involve the CEQA process, notification shall occur at the following two junctures:

- Upon issuance of a Notice of Intent to Issue a Negative Declaration or a Notice of Preparation for EIR/environmental impact statement (EIS); and
- Upon completion of a Negative Declaration or draft EIR/EIS (Notice of Completion).

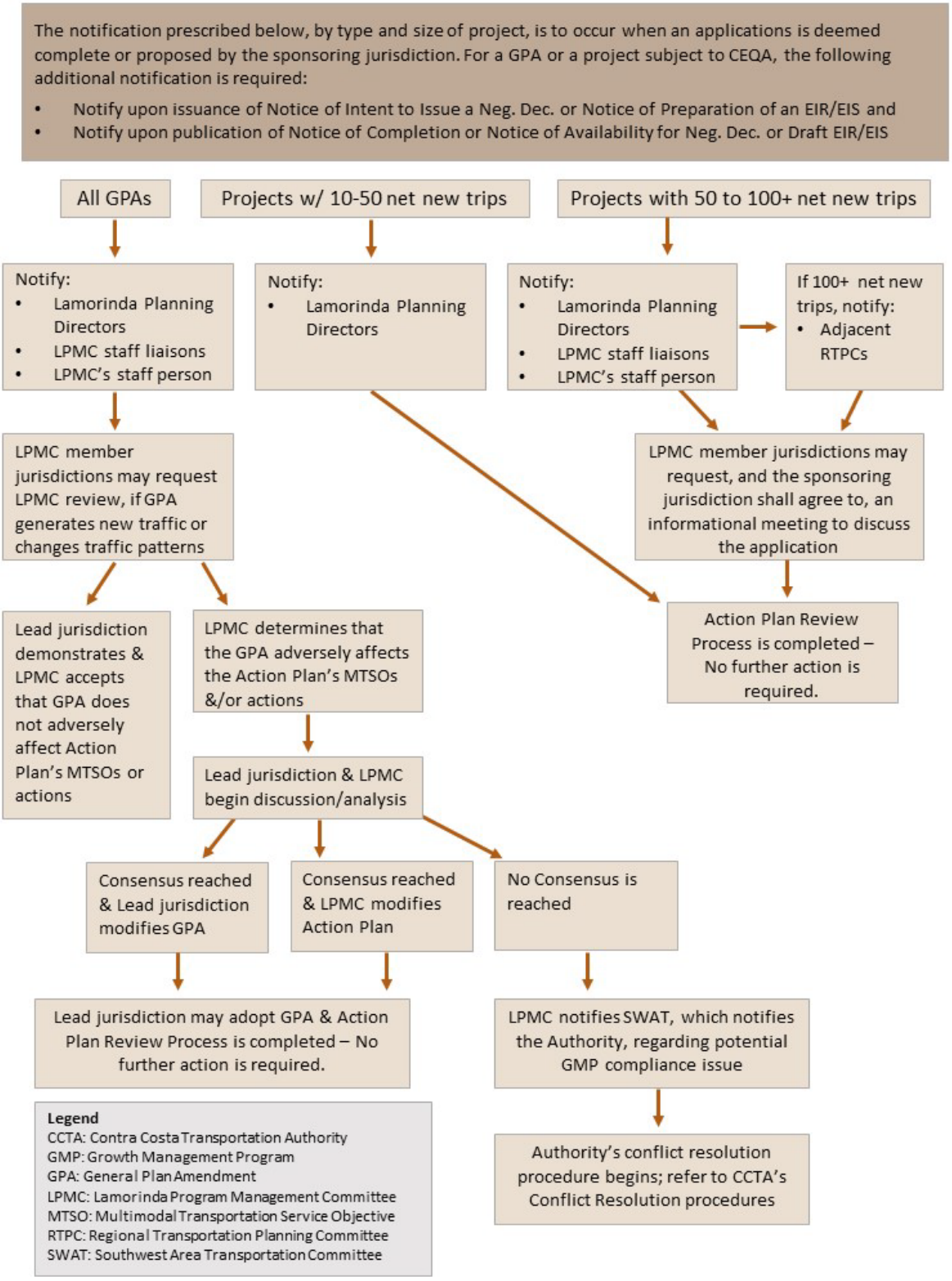
[27] Conversely, as required under Authority Resolution 93-02-G, the other RTPCs will notify SWAT of proposed projects and general plan amendments that exceed 100 peak hour vehicle trips.

In each case, the neighboring communities are to be provided an opportunity to review and comment on the environmental documents. Copies of the environmental documents are to be made available in hard-copy or electronic form. The Lamorinda subarea has made the policy more stringent than the established CCTA notification policy by setting the threshold for circulation below 100 NNPHVTs. The threshold for NNPHVTs is the threshold total number of vehicle trips projected to enter and leave the project site, during the AM or the PM peak hour (whichever is greater), not including bypass vehicle trips, and exempting vehicle trips that are currently generated by the site if it is under an existing use.

The process is intended to reflect the spirit of the cooperative multijurisdictional planning process as outlined in Measure J (2004). Furthermore, it is the intent of the Lamorinda jurisdictions to diligently notify one another regarding proposed projects and GPAs, irrespective of whether such notification is legally required under CEQA.

Figure 12-1 illustrates the notification procedure outlined here, as well as the procedure for review of GPAs, as discussed in the following section.

Figure 12-1: Action Plan Review Process for Lamorinda GPAs and Projects



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 Lamorinda, and do not yet reflect additional development capacity and by-right land use modifications under state laws that became effective on January 1, 2023. GPAs enacted after adoption of the Action Plan could therefore adversely affect the ability to meet this Action Plan's goals, policies, and objectives.

Existing General Plans were used as the basis for the modeled land use assumptions developed for the Action Plan. GPAs other than those assumed in the land use assumptions could reduce the effectiveness of the Action Plan. A process has been defined to address GPAs and their impact on the Action Plan, as illustrated in Figure 12-1.

The tools and procedures for conducting and analyzing GPAs shall be in accordance with the Measure J *Technical Procedures* and *Implementation Guide*. The jurisdiction considering the GPA should submit the GPA to the LPMC (and to other RTPCs if the amendment would generate more than 500 NNPHVTs) for evaluation of its impact on the ability to achieve Action Plan objectives. LPMC would then evaluate proposed amendments only in relation to issues affecting Action Plan success and consistency. It will be the responsibility of the jurisdiction considering the amendment to either:

- Demonstrate that the amendment will not violate Action Plan policies or the ability to meet Action Plan RTOs; or
- Propose modification to the Action Plan that will prevent the GPA from adversely affecting the regional transportation network.

If neither of these can be done, approval of the GPA by a Contra Costa jurisdiction may lead to a finding of non-compliance with the GMP.

If an RTO is not met following implementation of the Action Plan, the GPA would need to be reevaluated through the forum of LPMC and SWAT. Amendments to the Plan could include a relaxation of RTOs, a strengthening of actions, or a combination of these approaches.

In certain cases, the RTOs, as forecast, may exceed their prescribed thresholds under growth already included in the adopted general plans. This event alone will not result in a local jurisdiction being found out of compliance with the Measure J GMP. However, any GPAs that are proposed must not adversely affect the policies or RTOs of the Action Plan. In the case of RTOs that already exceed the thresholds, the GPA must not make it worse.

If there are RTO exceedances, or projected RTO exceedances in a Lamorinda jurisdiction, then that jurisdiction can either (a) implement transportation improvements to correct the RTO deficiency on that affected network segment, or (b) implement other measures intended to result in measurable improvements to RTOs on the RRS network. Failing this, the jurisdiction can refer the problem to the LPMC for joint resolution.

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 LPMC on RTO performance.
- Identification of RTOs not being met that 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 LPMC.

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 Lamorinda 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 LPMC 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, a revision to the Action Plan may be necessary.

Given the level of expected growth in Lamorinda and elsewhere throughout Contra Costa County and *the constraints on adding new capacity to the system, it should not be surprising if some RTOs are not attained. If nonattainment occurs, the only required action required is for LPMC 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 for development application review and GPAs, as established in the CCTA Implementation Guide, 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	20% commute trips 6% of all trips	27% of commute trips 12% of all trips
Transit RTO-2: Mode Share to/from BART	Increase mode share of people accessing BART with non-vehicle modes	None	25%	35%
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	5%	10%
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	5% all trips [a] 1% commute trips	8% all trips 3% for commute trips
Active Transportation RTO-2: Low-Stress Bicycle Network	Increase completeness of the LSBN	None	28%	90%
Active Transportation RTO-3: Unprotected Trail Crossings	Eliminate unprotected crossings of the LSBN intersections with roadways	None	No unprotected crossings	No unprotected crossings

RTO Name	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Roadways RTO-1: Freeway Delay Index	Maintain current delay index	Delay index: ≤2.0	Delay index: 3.0	Delay index: 3.0
Roadways RTO-2: Freeway Buffer Index	Maintain current buffer index	Buffer index: None	Buffer index: 0.5	Buffer index: 0.5
Roadways RTO-3: Intersection Level of Service (LOS)	Maintain LOS at RTO monitoring locations	Side street delay, no intersection LOS except for LOS "Good D" on Pleasant Hill Road outside of downtowns and at gateway areas	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), except on Pleasant Hill Road strive to maintain current v/c of 1.06 in the AM peak period and 1.36 in the PM peak period	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, except on Pleasant Hill Road strive to maintain current v/c of 1.06 in the AM peak period and 1.36 in the PM peak period
Roadways RTO-4: Roadway Segment LOS	Maintain LOS on two-lane roadways outside of urban areas	None	LOS E (≤40 miles per hour [mph])	LOS E (≤40 mph)
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
Climate Change RTO-1: Single-Occupant Vehicle (SOV) Mode Share	Decrease SOV mode share per capita	None	65% for commute trips	50% for commute trips
Climate Change RTO-2: Carpool Mode Share	Increase carpool mode share	None	13% for commute trips	20% for commute trips
Climate Change RTO-3: Vehicle Miles Traveled	Decrease daily VMT per service population	None	30.4 VMT daily per service population	27.2 VMT daily per service population
Climate Change RTO-4: Greenhouse Gas (GHG) Emissions	Decrease GHG emissions per capita	None	29 lbs per capita	Zero transportation related
Climate Change RTO-5: Zero-Emission Vehicles	Increase registered electric vehicles	None	50% total market share	100% total market share
Innovation and Technology RTO-1: Signal Interconnection Project [d]	Increase connected signals	None	Complete Signal Interconnection Project	None

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

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.

d) 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.

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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 not carried forward in 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, these could potentially be added and tracked in future updates.

- **Wait time for paratransit.** CCTA and the RTPC technical 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 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.
- **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 multi-family homes. Therefore, this RTO has not been included in the Action Plan. However, this Action Plan does include Action Innovation and Technology-5: 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 Lamorinda area in the coming years.

Appendix C:

Summary of Actions

Appendix C: Summary of Actions

Actions are contained in Chapters 5 through 10 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 Chapter 1, Introduction, this Action Plan constitutes a work program for LPMC, 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 LPMC 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 Town of Danville, the City of San Ramon, and Contra Costa County. It is possible that some Actions will not be completed, and inability to complete an Action will not result in this Action Plan being non-compliant with the Measure J GMP.

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:** Continue the augmentation and expansion of, and seek funding for, on-demand bus service (flex van) to BART stations and high-volume ridership locations.	CCTA	LPMC BART Lamorinda Transit Providers	Ongoing
◘ **Transit-2:** Improve transit access to BART throughout the county, including through: • Working with CCCTA to study feasibility of public transit service in the Pleasant Hill Road/Taylor Boulevard Corridor to connect to BART and to services in Lafayette. • Reduce bus headways on routes providing service to the Antioch/SFO BART line.	CCTA	LPMC Lamorinda Member Jurisdictions BART Lamorinda Transit Providers	Near-term
◘ **Transit-3:** Support CCTA and local public transit operators in: • Developing a Lamorinda Transit Plan to identify future community transit needs and set a shared vision for viable, sustainable public transit service for all. • Linking transit service in the entire subregion, including more directly to communities to the north and east of Lafayette and Orinda, between BART stations, between adjacent Central County communities, to Bishop Ranch and the Tri-Valley area, and through the Caldecott Tunnel. • Leveraging MTC's effort to standardize operations, regional mapping, and wayfinding.	Caltrans	CCTA Lamorinda Member Jurisdictions Lamorinda Transit Providers BART	Mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-4:** Work with CCTA, WCCTAC, local jurisdictions and all applicable transit agencies to explore the feasibility of service re-organization along the San Pablo Dam Road/Camino Pablo corridor to increase bus frequency, and to resolve transit stop access and amenity needs in the corridor.	CCTA	LPMC Lamorinda Member Jurisdictions WCCTAC Lamorinda Transit Providers	Near-term
▫ **Transit-5:** Support and seek funding for augmentation and, expansion, and continued operation of school bus service in Lamorinda.	Caltrans	CCTA Lamorinda Member Jurisdictions	Ongoing
▫ **Transit-6:** Seek funding to implement the recommendations of the Contra Costa Accessible Transportation Strategic Plan, including the establishment of a new Coordinating Entity and establishing a new, ongoing, and dedicated funding source.	CCTA	LPMC Lamorinda Member Jurisdictions Lamorinda transit operators Lamorinda Paratransit providers	Near-term
▫ **Transit-7:** Collaborate with the Moraga School District, Orinda School District, Lafayette School District, and the Acalanes Union High School District to reduce auto trips and to promote and increase ridesharing, use of transit, and bicycling and walking for travel to and from the public schools in Lamorinda.	CCTA	Lafayette School District	Near-term
▫ **Transit-8:** Work with CCTA and local transit operators to explore financial incentives and reduced fares for public transit, including a feasibility study to explore a subregional or countywide Universal Basic Mobility program.	CCTA	LPMC Lamorinda Member Jurisdictions Lamorinda transit operators MTC	Mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Transit-9:** Provide educational awareness of public transit options through outreach, education, and advertising, particularly in local schools.	511 Contra Costa	LPMC Lamorinda Member Jurisdictions Lamorinda transit operators	Ongoing
▫ **Transit-10:** 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.	511 Contra Costa	LPMCMTC Lamorinda Member Jurisdictions Lamorinda transit operators	Ongoing
▫ **Transit-11:** Work with local jurisdictions to develop intermodal transportation facilities (“Mobility Hubs”) that serve major activity centers and connect transit, pedestrian, bicycle facilities, and car/ride share in their planning documents, and site park and ride facilities, where appropriate.	CCTA	LPMC Lamorinda Member Jurisdictions Lamorinda transit operators	Mid-term
▫ **Transit-12:** Complete a study to explore the feasibility of a regional Express Bus Program and expansion and enhancement of Bus Rapid Transit along transit corridors and RRS.	CCTA	LPMC Lamorinda Member Jurisdictions Lamorinda Transit Operators	Near-term
▫ **Transit-13:** 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.	LPMC	CCTA Lamorinda Member Jurisdictions Lamorinda transit operators	Mid-term

Action	Lead Agency	Partner Agency	Timeline
◘ **Transit-14:** Assist local jurisdictions in reviewing and considering options for improving curb management and commercial and public bus, truck, and van passenger loading on key public streets.	CCTA	Lamorinda Member Jurisdictions	Near-term
◘ **Transit-15:** Adopt local policies that prioritize safety for the most vulnerable users at all stages of project planning and delivery.	Lamorinda Member Jurisdictions	CCTA Lamorinda transit operators	Near-term
◘ **Transit-16:** Work with CCTA and local transit providers to ensure real-time online transit information for all routes.	Lamorinda transit operators	CCTA Lamorinda Member Jurisdictions	Mid-term
◘ **Transit-17:** 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.	Lamorinda Member Jurisdictions	CCTA MTC Lamorinda transit operators	Mid-term
◘ **Transit-18:** Work with CCTA and public transit agencies 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	LPMC Lamorinda Member Jurisdictions Lamorinda transit operators	long-term
◘ **Transit-19:** Complete general improvements to BART stations to increase their use, including: • Pursue projects and programs that improve the passenger experience such as, upgrade systems, modernize stations, and expand the passenger capacity of BART stations. • Continue to work with CCTA and local jurisdictions to improve circulation and prioritize walking, bicycling,	BART	CCTA Lamorinda Member Jurisdictions Alameda CTC	Long-term

Action	Lead Agency	Partner Agency	Timeline
and bus transit access near major transit stops and stations			
◘ **Transit-20:** 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.	BART	CCTA Lamorinda Member Jurisdictions	Long-term
◘ **Transit-21:** Work with CCTA and local transit providers to reinstate high-quality transit that operated in the subregion prior to the pandemic.	BART	CCTA Lamorinda Member Jurisdictions	Long-term
CHAPTER 6, ACTIVE TRANSPORTATION			
◘ **Active Transportation-1:** Work with local and regional jurisdictions to adopt and update 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 with emphasis on Safe Routes to School, Safe Routes to Transit, and the downtown.	Lamorinda Member Jurisdictions	CCTA	Ongoing
◘ **Active Transportation-2:** Explore the feasibility of widening existing pedestrian/bicycle facilities, including improvements to school streets where feasible to accommodate demand and improve safety.	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term
◘ **Active Transportation-3:** Seek funding to provide bicycle parking infrastructure at employment sites and activity centers throughout Lamorinda.	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-4:** Install bicycle facilities as part of any future roadway improvements as feasible, and to complete gaps in the bicycle network, with an emphasis on protected facilities over unprotected facilities.	Lamorinda Member Jurisdictions	CCTA LPMC Lamorinda Member Jurisdictions	Ongoing
▫ **Active Transportation-5:** Make the following Improvements to the Lafayette-Moraga Regional Trail: • Crossings improvements at high traffic volume crossings. • Work with East Bay Municipal Utilities District (EBMUD) and East Bay Regional Parks District (EBRPD) to reopen the trail near August Drive between School Street Bridge and Canyon Road Bridge.	Lamorinda Member Jurisdictions	CCTA LPMC Lamorinda Member Jurisdictions	Ongoing
▫ **Active Transportation-6:** 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	LPMC Contra Costa Health Services Street Smarts Diablo School Districts Lamorinda Member Jurisdictions	Ongoing
▫ **Active Transportation-7:** Implement a Safe Routes to School Program to evaluate and encourage safety improvements for multimodal transportation and access to and from schools.	CCTA	LPMC Contra Costa Health Services Street Smarts Diablo School Districts Lamorinda Member Jurisdictions	Near-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-8:** Work with local jurisdictions to promote 511 Contra Costa's active transportation programs that increase educational awareness of multimodal travel options, travel behavior incentives, and safety through outreach, events, education, social media, marketing, and advertising.	511 Contra Costa	CCTA LPMC Lamorinda Member Jurisdictions	Ongoing
▫ **Active Transportation-9:** Construct gap closure projects in the countywide LSBN to establish a safe, and contiguous network, including but not limited to: • Wilder Road to Moraga Way • Moraga Way between Moraga Road and Orinda BART	Each project to be led by the responsible agency, generally either a local jurisdiction or East Bay Regional Parks District	CCTA LPMC East Bay Regional Parks District Lamorinda Member Jurisdictions	Mid-term
▫ **Active Transportation-10:** 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 County residents.	511 Contra Costa	LPMC	511 Contra Costa
▫ **Active Transportation-11:** Work with CCTA, EBRPD, and other public facilities management agencies to develop a method of tracking the Pavement Condition Index (PCI) of bicycle facility segments along the LSBN and implement rehabilitation, repair, and replacement modifications improvements where and as needed.	CCTA	East Bay Regional Parks District Lamorinda Member Jurisdictions	Mid-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Active Transportation-12:** Construct bicycle and pedestrian crossing improvements at the following intersections: • St. Mary's Road and Rheem Boulevard where the intersection improvements are limited to a painted crosswalk and stop sign along Rheem Boulevard. • Lafayette-Moraga Regional Trail crossing at Canyon Road where the intersection improvements are limited to a painted crosswalk.	Lamorinda Member Jurisdictions where these intersections are located	CCTA East Bay Regional Parks District Lamorinda Member Jurisdictions	Long-term
▫ **Active Transportation-13:** Implement micromobility recommendations from the Countywide Bicycle and Pedestrian Plan, including those related to ordinances and request for proposals (RFPs), and work with operators to deploy micromobility systems, built off industry best management practices.	CCTA	Lamorinda Member Jurisdictions	mid-term
▫ **Active Transportation-14:** Develop a plan that supports transportation infill development though the construction and funding of a bicycle and pedestrian bridge over SR-24 that connects the two sides of Downtown Orinda with each other and with the Orinda BART Station. Construct this bridge when feasible.	CCTA	LPMC Lamorinda Member Jurisdictions	Ongoing
▫ **Active Transportation-15:** Work with local schools to prepare school enrollment maps that show where students live in relation to school and use this information to develop programs that encourage walking and bicycling and discourage driving. Such programs may include remote drop-off zones, carpools, and parking restrictions for nearby students.	CCTA	LPMC Lamorinda Member Jurisdictions	Ongoing

Action	Lead Agency	Partner Agency	Timeline
◘ **Active Transportation-16:** Work with CCTA to conduct, update, and implement a comprehensive countywide Pedestrian Needs Assessment.	CCTA	LPMC Other RTPCs Lamorinda Member Jurisdictions	Mid-term
◘ **Active Transportation-17:** 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.	CCTA	LPMC Lamorinda Member Jurisdictions East Bay Regional Parks District	Mid-term
◘ **Active Transportation-18:** Work with CCTA, County staff, and Walnut Creek staff to implement the Olympic Connector Project.	CCTA	LPMC Lamorinda Member Jurisdictions City of Walnut Creek	Ongoing
CHAPTER 7, ROADWAYS			
◘ **Roadways-1:** Complete necessary operational improvements (e.g., protected turn lanes, synchronized signal timing, traffic calming measures, auxiliary lanes) on freeways, at intersections and on roadway segments that are needed to maintain the RTOs in this Action Plan, while ensuring balancing these improvements against the objectives and actions regarding other modes and issues covered by this Action Plan.	Caltrans (for freeways) Lamorinda member jurisdictions where the individual facilities are located (for surface roadways)	CCTA LPMC	ongoing
◘ **Roadways-2:** Work with TRANSPAC, WCCTAC and local jurisdictions to develop a program to discourage diversion from freeways and cut-through travel on surface roadways.	CCTA	LPMC Caltrans Lamorinda Member Jurisdictions	Mid-term

Action	Lead Agency	Partner Agency	Timeline
◘ **Roadways-3:** 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, high-occupancy vehicle (HOV)/high-occupancy toll (HOT)lane and bypass lanes, and others to support a cohesive transportation system for all modes.	Caltrans	CCTA LPMC Lamorinda Member Jurisdictions MTC	Ongoing
◘ **Roadways-4:** Work with CCTA, TRANSPAC, WCCTAC and local jurisdictions to implement HOV/HOT and transit improvements along freeway corridors to reduce single occupant automobile use and increase ride-sharing and transit.	CCTA	LPMC Caltrans Lamorinda Member Jurisdictions	Mid-term
◘ **Roadways-5:** 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	LPMC Caltrans CHP Lamorinda Member Jurisdictions	Mid-term
◘ **Roadways-6:** Continue studying the feasibility of pilot and long-term programs for bus on shoulder on SR-24.	CCTA	LPMC Caltrans Lamorinda 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	LPMC Alameda CTC Port of Oakland	Long-term

Action	Lead Agency	Partner Agency	Timeline
◘ **Roadways-8:** Conduct Integrated Corridor Management (ICM) studies for the SR-24 corridor to improve multimodal function of countywide facilities.	CCTA	LPMC Caltrans Lamorinda Member Jurisdictions	Long-term
◘ **Roadways-9:** 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 Lamorinda Member Jurisdictions	Near-term
◘ **Roadways-10:** Complete needed projects on SR-24 to maintain targeted delay and buffer index goals without increasing traffic in downtowns or residential neighborhoods,	CCTA	LPMC Caltrans Lamorinda Member Jurisdictions	Long-term
◘ **Roadways-11:** Seek and secure funding to implement the Lafayette Downtown Congestion Study to get Lamorinda trips to and from SR-24.	CCTA	LPMC Lamorinda Member Jurisdictions	Long-term
◘ **Roadways-12:** Coordinate and improve procedures of Lamorinda agencies for detecting, reporting, announcing and documenting lane or road closures.	CCTA	LPMC Lamorinda Member Jurisdictions	Long-term
◘ **Roadways-13:** Improve coordination of Lamorinda procedures/practices for traffic management during lane or road closure.	CCTA	LPMC Lamorinda Member Jurisdictions	Long-term
◘ **Roadways-14:** Work collaboratively to reduce the incidence of road closures, including due to construction activities replacing or reconstructing underground utilities and ensure vegetation and drainage facilities are maintained to reduce potential interference with traffic flow.	CCTA	LPMC Lamorinda Member Jurisdictions	Long-term

Action	Lead Agency	Partner Agency	Timeline
▫ **Roadways-15:** Develop subregional corridor management plans for Moraga Road, Moraga Way, Camino Pablo, San Pablo Dam Road, and Pleasant Hill Road, to provide adequate roadway capacity for local and subregional travel while also including both public and active transportation modes and nonmodal transportation issues such as equity, climate change, safety, and technology. Plans on evacuation routes should also address long-term emergency evacuation.	CCTA	LPMC Lamorinda Member Jurisdictions	Long-term
▫ **Roadways-16:** Investigate appropriate mechanisms, including maintaining existing roadway lanes and widths and restrictive signal timing and metering, to discourage use of arterial roads as a substitute for freeway travel.	CCTA	LPMC Caltrans Lamorinda Member Jurisdictions	Long-term
▫ **Roadways-17:** 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	LPMC Caltrans Lamorinda Member Jurisdictions	Long-term
▫ **Roadways-18:** Explore opportunities to work with TRANSPAC to develop a traffic management program to discourage use Pleasant Hill Road as a detour to traffic north of SR-24 to bypass the I-680 SR-24 interchange.	LPMC	TRANSPAC CCTA Caltrans Lamorinda and Central County Member Jurisdictions	Long-term
▫ **Roadways-19:** Work with relevant partner agencies to conduct long term Lamorinda emergency evacuation planning studies which will include, but are not limited to, traffic signal upgrades necessary for evacuation counterflow signal operations	LPMC	CCTA Caltrans Lamorinda Member Jurisdictions	Mid-term

Action	Lead Agency	Partner Agency	Timeline
CHAPTER 8, SAFETY			
◘ **Safety-1:** Work with regional and local agencies to increase the level of multimodal public awareness and empathy about bicycle and pedestrian safety and to reduce injuries due to vehicle-involved collisions.	511 Contra Costa	LPMC Lamorinda Member Jurisdictions	Ongoing
◘ **Safety-2:** Implement the following to monitor traffic speeds in Lamorinda: • Monitor and evaluate traffic speed and other safety issues, particularly around schools, on an annual basis. • Seek to reduce the speed limit on Taylor Boulevard to improve safety around the elementary and high schools and at the southbound approach to Pleasant Hill Road. • Use technology to increase multimodal Traffic Safety to slow vehicle speeds and reduce the severity of collisions. • Install speed cameras in areas where enhanced speed enforcement is needed.	CCTA	LPMC Lamorinda Member Jurisdictions 511 Contra Costa	Mid-term
◘ **Safety-3:** Work with CCTA to coordinate the collection and analysis of safety data, identify areas of concern, and propose safety-related improvements and user awareness to support countywide, state, and federal safety programs and performance measures.	CCTA	511 Contra Costa East 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	Lamorinda Member Jurisdictions	Ongoing

Action	Lead Agency	Partner Agency	Timeline
◘ **Safety-5:** Prepare an incident management plan for the SR-24.	CCTA	LPMC California Highway Patrol Caltrans	Mid-term
◘ **Safety-6:** Continue to identify all safety-related transportation improvements needed within 500 feet of schools.	CCTA	LPMC Lamorinda Member Jurisdictions 511 Contra Costa	Mid-term
◘ **Safety-7:** Work with CCTA, MTC, and 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	MTC East Bay Regional Parks District Lamorinda Member Jurisdictions	Mid-term
◘ **Safety-8:** Encourage local jurisdictions to complete a Local Road Safety Plan.	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term
◘ **Safety-9:** Support funding of a Safe Routes to School Program.	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term
CHAPTER 9, CLIMATE CHANGE			
◘ **Climate Change-1:** Encourage “green” travel including Zero Emission Vehicles and New Energy Vehicles, clean fuel infrastructure and car sharing.	CCTA	LPMC Lamorinda 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	LPMC Lamorinda Member Jurisdictions	Ongoing

Action	Lead Agency	Partner Agency	Timeline
◘ **Climate Change-3:** Work with regional agencies, local employers, and schools to increase remote work opportunities, compressed work weeks, alternative work locations, and flex schedules, and provide pretax employer transportation benefit programs.	CCTA	LPMC School Districts Employers Lamorinda Member Jurisdictions	Mid-term
◘ **Climate Change-4:** Work with 511 Contra Costa and local jurisdiction TDM Advisory Councils to expand TDM programs, adopt local TDM plans, and conduct regular monitoring and reporting for program effectiveness.	511 Contra Costa	CCTA LPMC Lamorinda Member Jurisdictions	Ongoing
◘ **Climate Change-5:** Continue to promote EV ownership by offering financial incentives and providing educational programs and demonstrations.	CCTA	LPMC Lamorinda Member Jurisdictions	Ongoing
◘ **Climate Change-6:** Adopt local policies that prioritize mobility for GHG-reducing modes of transportation.	Lamorinda Member Jurisdictions	CCTA LPMC	Mid-term
Chapter 10, Innovation and Technology			
◘ **Innovation and Technology-1:** Interconnect the Lamorinda 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	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term

Action	Lead Agency	Partner Agency	Timeline
• Connection to BART • Presence of bicycle facilities at the intersection • High number of bicycle and pedestrian collisions • Geographic distribution across the county and the subregion • Connection to shared mobility hubs • High traffic volume			
◘ **Innovation and Technology-2:** Examine the feasibility of implementing a pilot Automated Driving System or other modal technologies (such as an autonomous bus/shuttle) somewhere in the Lamorinda area.	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term
◘ **Innovation and Technology-3:** Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.	CCTA	LPMC Lamorinda Transit Operators Lamorinda Member Jurisdictions Transportation Network Companies	Ongoing
◘ **Innovation and Technology-4:** Coordinate with CCTA and local jurisdictions to identify solutions to the Intelligent Transportation System (ITS) communications needs during the development and implementation of a Regional ITS Communications Plan and/or regional communications infrastructure, including expanding fiber to link all traffic signals and bolster communications for signals, etc.	CCTA	LPMC Lamorinda Member Jurisdictions	Near-term

Action	Lead Agency	Partner Agency	Timeline
◘ **Innovation and Technology-5:** Work with CCTA to determine a method for tracking the availability of EV charging stations.	CCTA	LPMC Lamorinda Member Jurisdictions	Near-term
◘ **Innovation and Technology-6:** 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	LPMC Lamorinda Member Jurisdictions	Ongoing
◘ **Innovation and Technology-7:** Improve the safety of high-incident local roadways through physical changes, signage, technology, education, enforcement, or other tools.	CCTA	LPMC Lamorinda 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 LPMC Lamorinda Member Jurisdictions	Mid-term
◘ **Innovation and Technology-9:** Work with CCTA and local jurisdictions to implement the CCTA EV Readiness Blueprint	CCTA	LPMC Lamorinda Member Jurisdictions	Mid-term
CHAPTER 11, FINANCIAL OUTLOOK			
◘ **Financial-1:** Continue to participate in annual updates of the Lamorinda Transportation Impact Fee (LTIF) structure to ensure it will produce sufficient funds in light of current and anticipated growth rates and construction costs.	Lamorinda Member Jurisdictions	CCTA LPMC East Contra Costa Regional Fee & Financing Authority	Ongoing

Appendix D:

Transportation Modeling Results

Appendix D: Transportation Modeling Results

Table D-1: RTO Monitoring Location Peak-Hour LOS (2019)

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Camino Pablo & Wildcat Canyon Rd	B	12	C	26	B	12	C	30
Pleasant Hill Rd & Reliez Valley Rd	E	57	A	7	D	44	C	21
Pleasant Hill Rd & Deer Hill Rd* [a]	v/c 1.06		v/c 1.36		v/c 1.03		v/c 1.27	
Camino Pablo & Miner Rd	B	17	B	17	B	17	C	23
Camino Pablo & Santa Maria Way/ SR-24 WB on	C	31	F	91	C	31	F	99
Camino Pablo & SR-24 EB off/	F	85	F	230	F	87	F	232
SR-24 EB ramps & Acalanes Rd	B	20	C	26	B	20	C	27
Mt Diablo Blvd & Pleasant Hill Rd	D	41	D	42	D	41	D	46
Pleasant Hill Rd & SR-24 off/ Old Tunnel Rd	A	9	B	13	A	9	B	13
Moraga Rd & Canyon Rd	B	19	D	36	B	19	D	36
Moraga Rd & St Mary's Rd	B	14	C	25	B	14	C	25
Moraga Rd & Mt Diablo Blvd*	C	20	F	86	C	21	F	86

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.

a) The intersection of Pleasant Hill Road and Deer Hill Road is measured in v/c ratio instead of LOS in order to provide more.

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Appendix E:

RTO Measurement and Modeling Methodologies

Lamorinda Action Plan

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 Access.** Increase the number of rides by paratransit 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 SOV 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 GHG 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 MTC Plan Bay Area 2050 projections for Contra Costa County. The transportation network assumed the Baseline 2050 scenario was derived from the CCTA 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:[28]

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

[28] 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[29] 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 Program Access

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

This RTO assesses the demand for paratransit[30] 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.

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

[30] 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 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.[31] 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.

[31] 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 bicycleway 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.

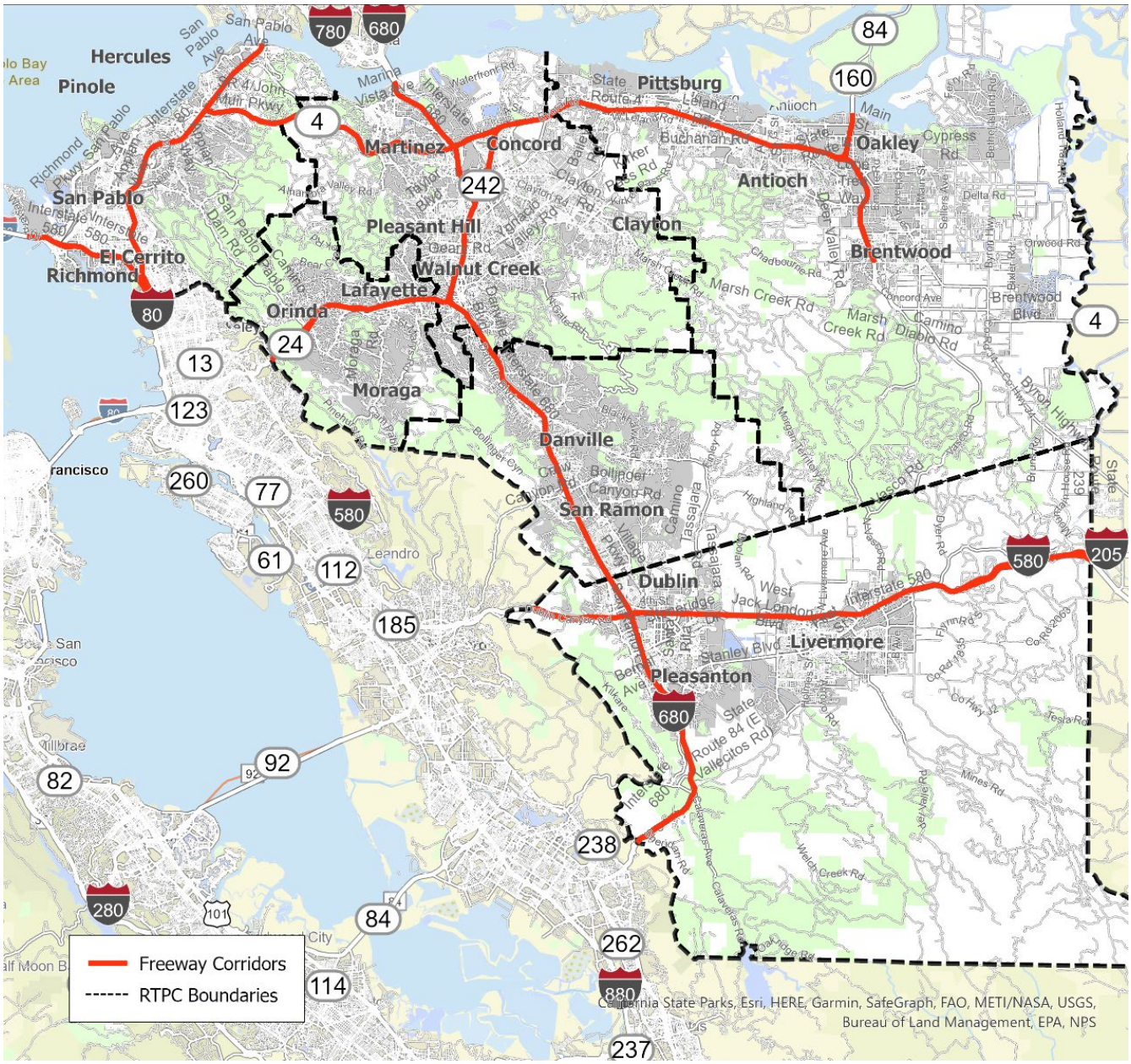
Table E-2. Freeway Facilities and Previous Performance Targets

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[32] and 2021 Congestion Management Plan (CMP) monitoring.[33] 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 1 and Figure 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 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.

[32] Contra Costa Sub-regional Action Plans for the Routes of Regional Significance Multimodal Traffic Service Objectives (MTSO) Draft 2017 Monitoring Report (March 2018).

[33] 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, the observed delay index for existing conditions is high in the a.m. westbound direction and p.m. eastbound direction. The modeled condition for 2050 generally shows an increase in delay index for SR-24 to 3.2 and 2.6, respectively.

Based on current performance and the future modeled performance, this Action Plan sets a delay index target of 3.0.

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.[34] 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.

[34] 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	LOS F on all intersections. [a]

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
	▫ Pacheco Boulevard ▫ Pleasant Hill Road ▫ Taylor Boulevard ▫ Treat Boulevard ▫ Ygnacio Valley Road/Kirker Pass Road	
TRANSPLAN (East County)	▫ Auto Center Drive ▫ Bailey Road ▫ Balfour Road ▫ Brentwood Boulevard/Main Street ▫ Buchanan Road ▫ Deer Valley Road (improved portion) ▫ East 10th Street/Harbor 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.

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
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 ▫ San Ramon Valley Boulevard ▫ Santa Rita Road ▫ Stanley Boulevard ▫ Stoneridge Drive ▫ Sunol Boulevard ▫ Sycamore Valley Road ▫ Tassajara Road ▫ Vasco Road	LOS E on all intersections except no standard for intersections in downtown areas and those exempt by General Plans.

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)

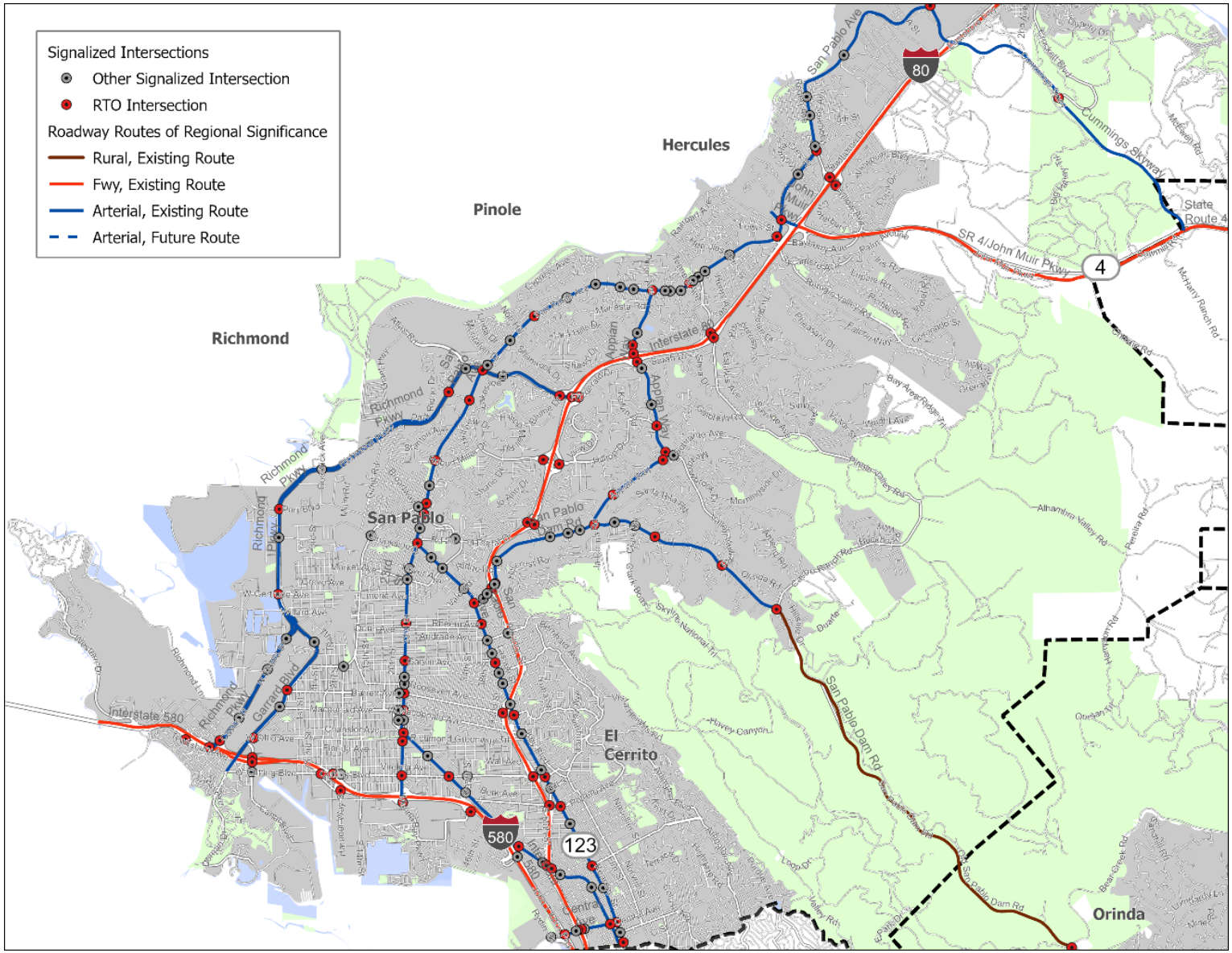


Figure E-3. Arterial Intersections and Roadway RRS (Central County)

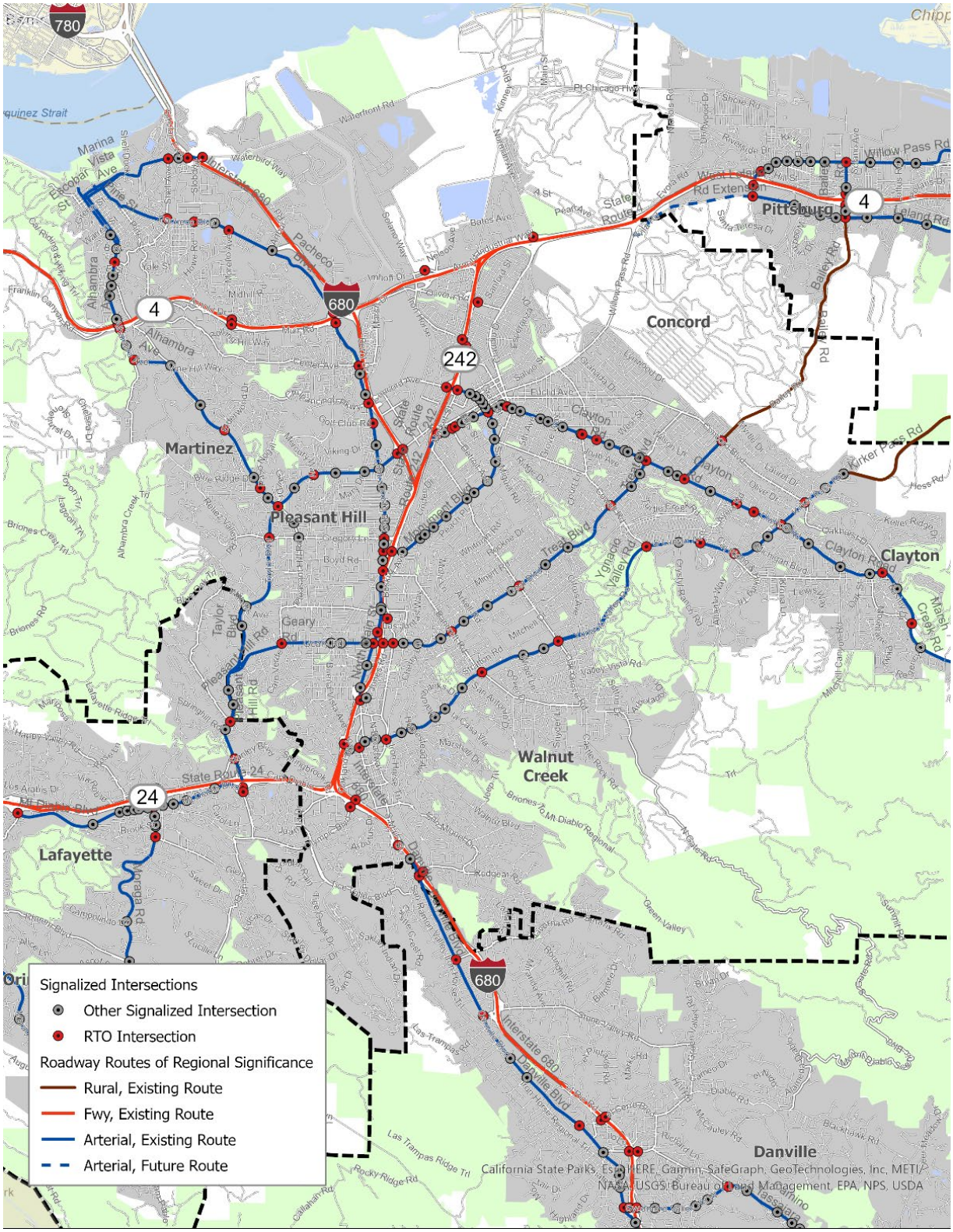


Figure E-4. Arterial Intersections and Roadway RRS (East County)

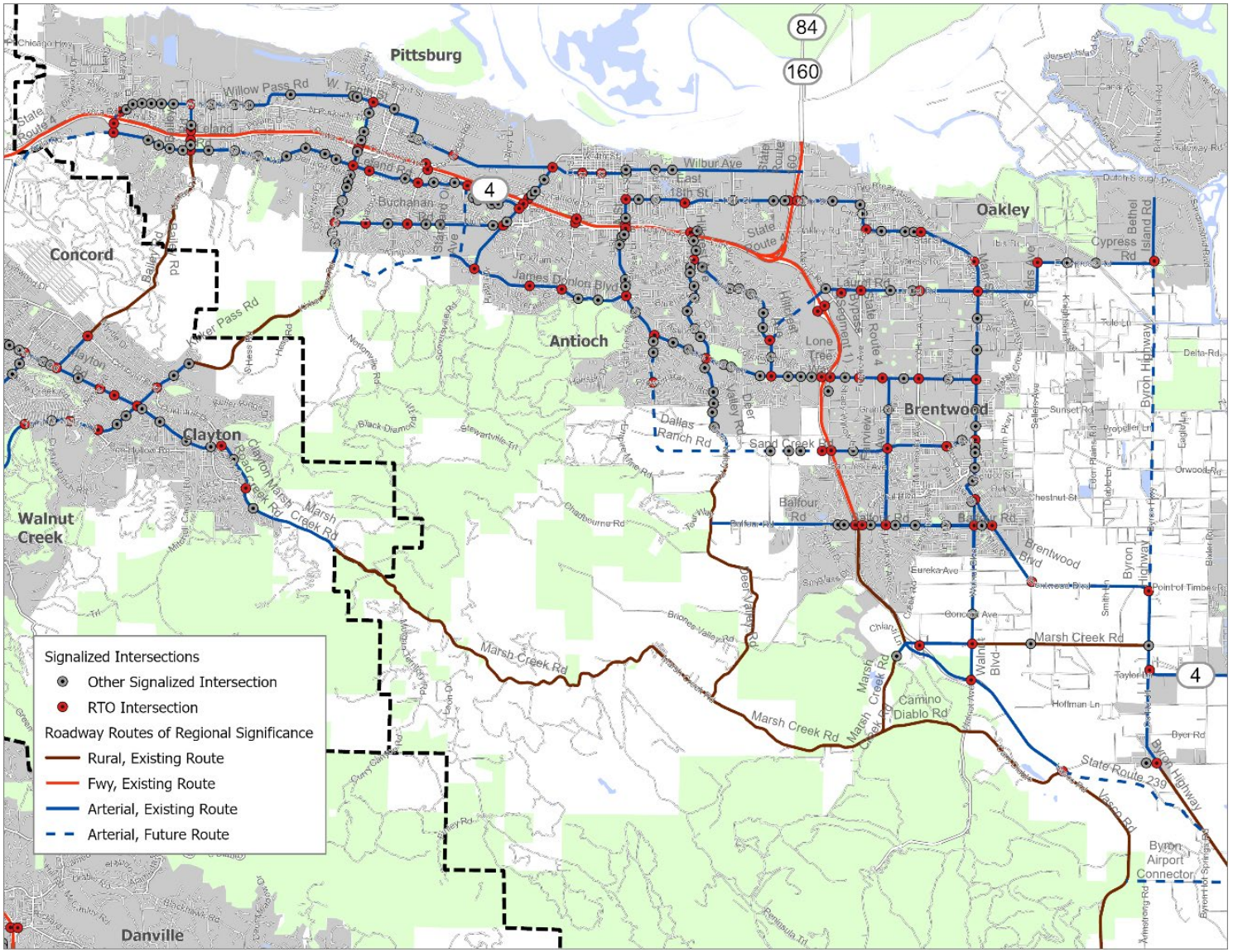


Figure E-5. Arterial Intersections and Roadway RRS (Southwest County – Lamorinda)

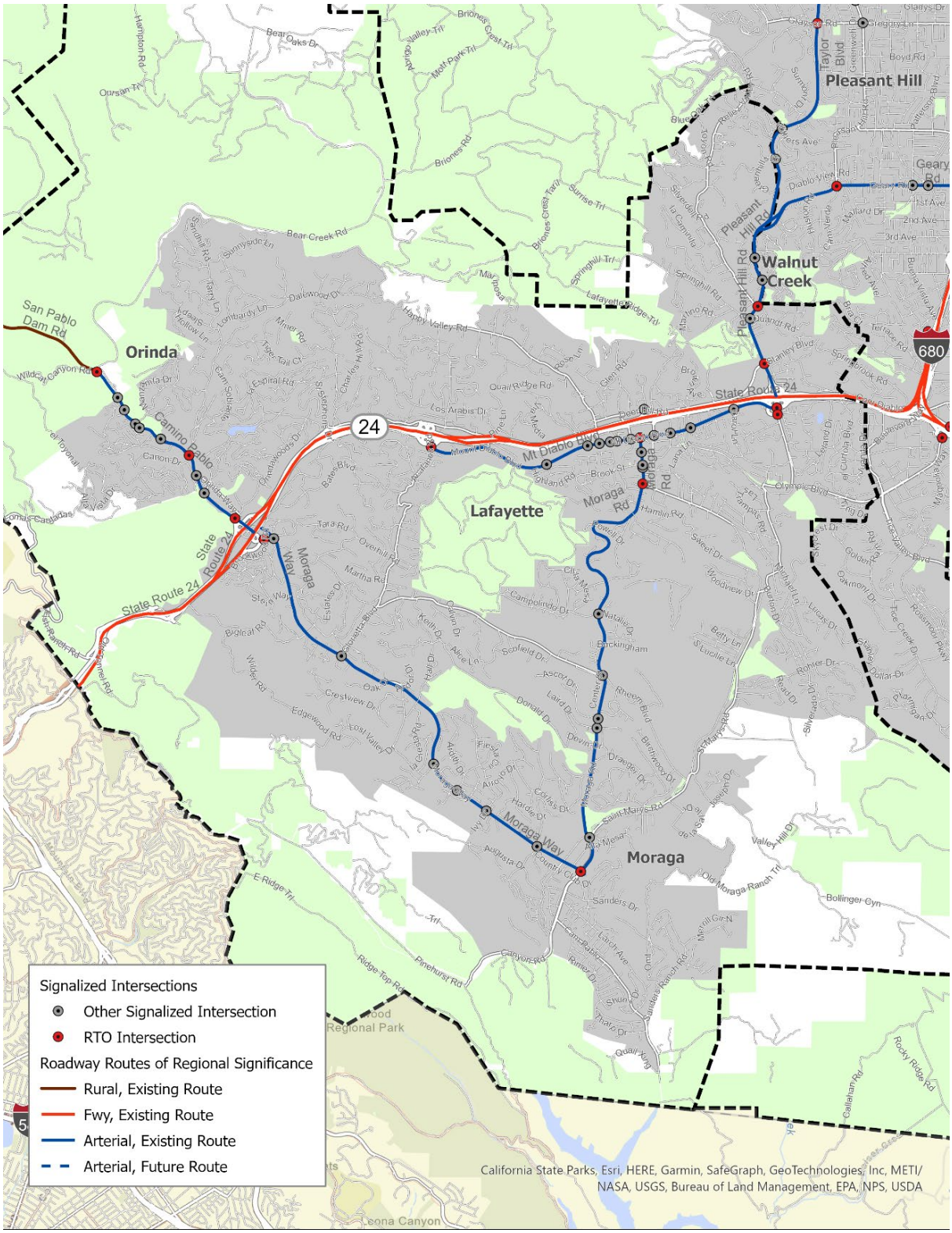
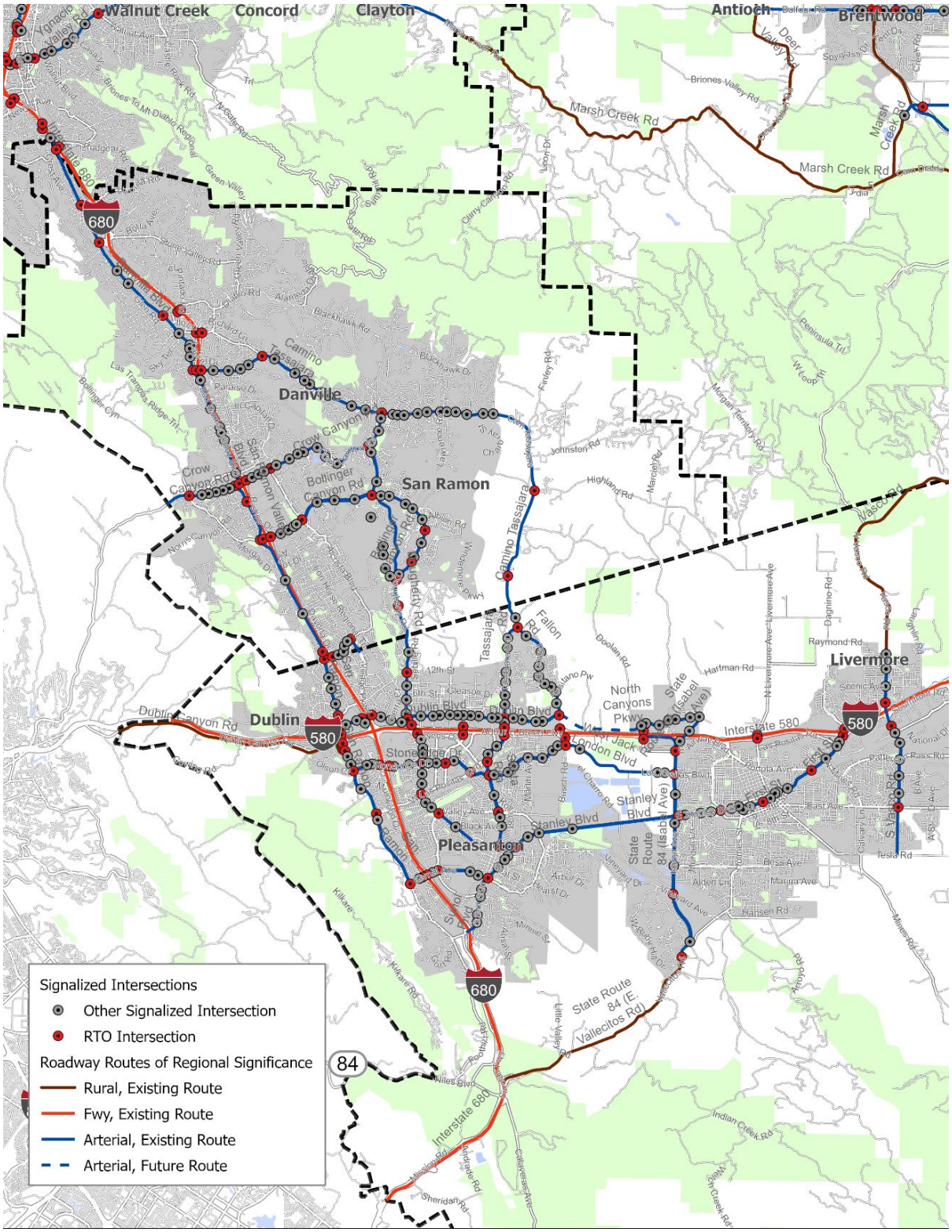


Figure E-6. Arterial Intersections and Roadway RRS (Southwest County – Tri-Valley)



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.[35] 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

[35] 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 E-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 E7. 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)[36] 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 January1, 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.

[36] 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.[37] 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

[37] 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 ¼-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.

Appendix F

Gateway Constraints Policy

5.3 Gateway Constraint Policy

A key policy of this Action Plan for Lamorinda is to carry forward the adopted "gateway constraint" policy that controls the physical width of regional routes that serve Lamorinda. As stated in Section 2.1, the policy reads as follows: "Maintain capacity constraints at selected gateways with the intent of preserving and

[7] Contra Costa Transportation Authority, Growth Management Program Implementation Guide, June 16, 2010, p. 36.

improving mobility on Routes of Regional Significance within Lamorinda." The policy sets maximum number of through lanes and lane widths for SR-24 inbound gateways, except short-link segments providing access to SR-24 and similarly, identifies limits on the number of lanes for arterials such as Pleasant Hill Road and Camino Pablo.

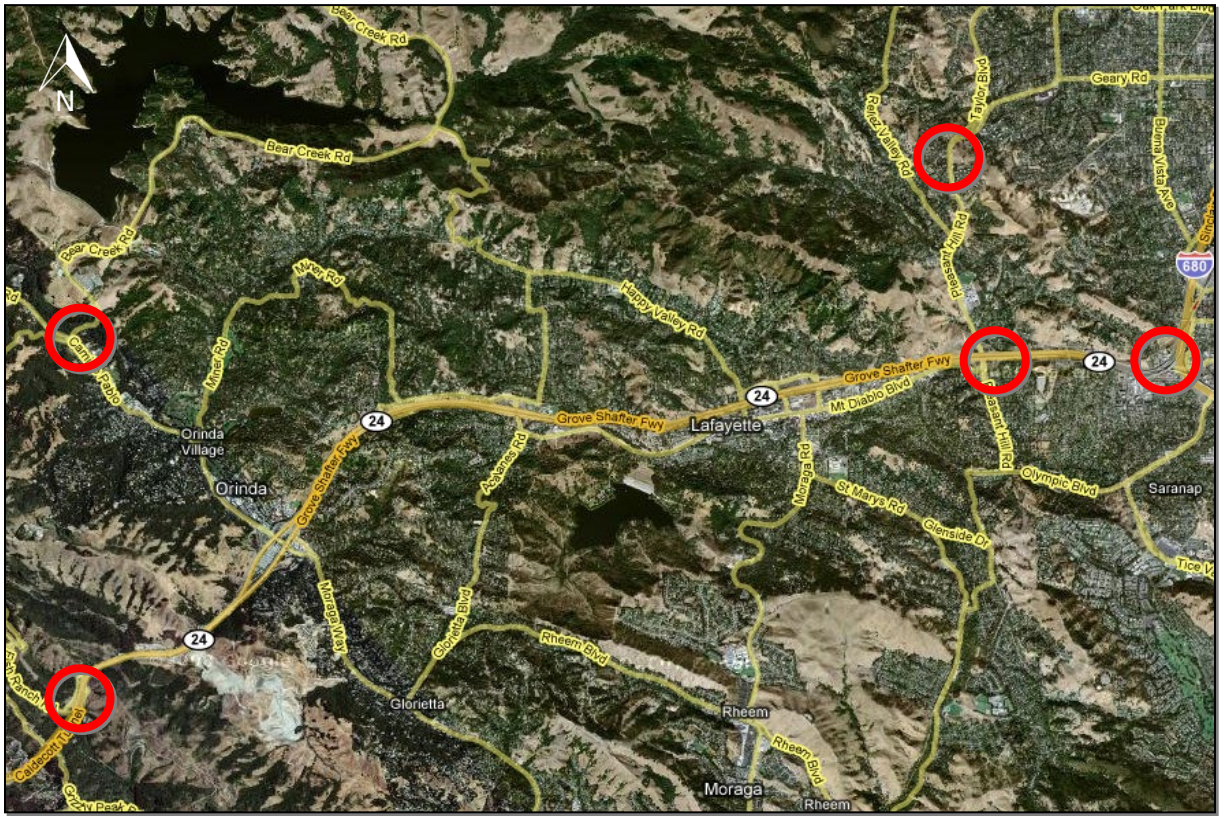
The Gateway Constraint policy is beneficial to Lamorinda residents, because it reserves some room on the regional system for traffic that has an origin and/or destination in Lamorinda. Furthermore, the modeling analysis indicates that a Gateway Constraint policy may be the key to achieving the MTSOs for Lamorinda.

The south county jurisdictions of SWAT (Danville, San Ramon, and Contra Costa County) also have a Gateway Constraint policy that has been in place since 1995, when the first Tri-Valley Transportation Plan/Action Plan was adopted. The policy has been successfully implemented through the TVTC, whose Contra Costa jurisdictions fall under the purview of SWAT as the designated RTPC under Measure C/J.

5.4 Gateway Policies for Specific Routes

The location of Lamorinda gateways are identified in Figure 14. Each of the gateways is addressed below.

Figure 14: Locations of Lamorinda Gateways



SR-24: The four-lane Caldecott section of SR-24 in the eastbound direction, and the four-lane cross section of SR-24 in the westbound direction, just west of the Pleasant Hill Road off-ramp, represent gateway constraints. In the eastbound direction, SR-24 gateway capacity is currently limited by the Caldecott Tunnel. At the time the baseline MTSO monitoring data was collected in 2013, the Caldecott Tunnel had three tunnels, each with two lanes. The center tunnel was reversible and was operated in the peak direction: westbound in the morning and eastbound in the evening. This method of operation provided four lanes of capacity in the peak direction. Because of the combination of factors at the entrances to the tunnel, the practical capacity in the peak direction was limited to about 8,000 to 8,400 vehicles per hour. Although a two-lane, fourth bore for the Caldecott Tunnel was opened in late 2013, only the capacity of the off-peak direction was increased for which only one tunnel (two lanes) was previously available.

The capacity constraint for westbound traffic at the east end of SR-24 results from northbound and southbound congestion on I-680 during the morning peak producing stop-and-go conditions before the exit ramps to SR-24. A second constraint exists westbound on SR-24 at the Pleasant Hill Road exit where an auxiliary lane ends. Six lanes of westbound traffic enter SR-24 from the east end: three from southbound I-680, two from northbound I-680 and one from Mt. Diablo Boulevard in Walnut Creek. These six lanes merge to five lanes for a short segment, but only four lanes continue past the Pleasant Hill Road exit. The effective westbound capacity constraint at that point is about 8,400 to 8,800 vehicles per hour.

Pleasant Hill Road: The two southbound through lanes on Pleasant Hill Road–Taylor Boulevard are proposed as a gateway constraint. The Gateway Constraint Policy would prohibit the addition of any through lanes, including short-link segments, on any portion of Pleasant Hill Road between SR-24 and the Lafayette city limits line north of the intersection with Taylor Boulevard. The other details of the gateway constraint are to be defined in a traffic management plan developed jointly with TRANSPAC (see Action 4.04 in Table 7). Pleasant Hill Road is two through lanes in each direction from its merge with Taylor Boulevard south to SR-24 with additional turn lanes at most intersections. The first signalized intersection south of the Pleasant Hill Road-Taylor Boulevard merge is at the "T" intersection with Rancho View Drive. Other major intersections are at Green Valley Road, Reliez Valley Road, Spring Hill Road and Stanley Road/Deer Hill Road. Each of these signalized intersections has left- and right-turn lanes on Pleasant Hill Road.

The capacity constraints on arterials providing access to the Lamorinda area are determined by the number of lanes and the timing of signals at intersections near the entry point. On Pleasant Hill Road southbound during the AM peak period, capacity is determined primarily by the timing of signals at the four major intersections and how much green time is given to Pleasant Hill Road and how much is given to the cross streets. While the gateway policy includes physical characteristics at key intersections, gateway constraints may also be affected by

varying the timing of signals, both along the corridor and at strategic entry points into the system. This action is further discussed below in the Traffic Management strategy section.

Camino Pablo/San Pablo Dam Road: Camino Pablo/San Pablo Dam Road is one lane in each direction with left turn lanes at most major intersections from the Orinda border south to Miner Road. It is two lanes in each direction with left and right turn lanes from Miner Road to SR-24. The southbound gateway capacity for the road is set primarily by the signals along the two-lane section of the road at Wildcat Canyon/Bear Creek Road, Miner Road and El Toyonal/Orinda Way.

5.5 Traffic Management Strategies

While a Gateway Constraint policy could limit the volume of traffic entering Lamorinda during peak hours, it would not fully address the operational issues of how to manage the flow of traffic through the gateways. For that reason, Traffic Management Strategies are also proposed to further address the issue of peak hour traffic entering Lamorinda during the peak period. Traffic Management Strategies include single point metering (metering traffic through a signalized intersection) and signal timing coordination. For example, to encourage through commuters to use I-680 rather than Pleasant Hill Road, one possible traffic management strategy would be to meter the through-traffic flow on southbound Pleasant Hill Road in the AM peak period, while maintaining accessibility for Lamorinda residents who wish to enter Pleasant Hill Road via cross-streets within Lamorinda. A similar strategy could be appropriate for Camino Pablo/San Pablo Dam Road. [8]

The AM peak period traffic volume southbound on Pleasant Hill Road south of Reliez Valley Road was 2,690 vehicles based on a count taken in 1990 just before the improved I-680/SR-24 interchange was opened. By 2000, the volume had dropped to 1,974 because more traffic was using I-680 and SR-24. However, increasing congestion at the interchange in the past few years has resulted in an increase in the volume on Pleasant Hill Road indicating more diversion.

Before implementing a traffic management strategy to restrict the flow of entering vehicles on either of these two arterials, turning-movement traffic counts should be conducted at the intersections along the corridor that might be considered as the constraining point to determine intersection level of service and the amount of traffic that might be diverted by the constraint. In addition turning-movement

[8] The traffic management strategy of single point metering and signal timing coordination is not without precedent. In the East County and Central County subareas, the Railroad Avenue/Kirker Pass Road/Ygnacio Valley Road corridor functions as a major travel route for commuters coming from East to Central County in the westbound AM peak period. The Central County Action Plan proposed that a Traffic Management Program (TMP) should be jointly prepared by the TRANSPAC and TRANSPLAN RTPCs to address this heavy commute traffic. In 2001, the TMP was developed and subsequently implemented throughout the corridor, with single point metering at agreed-upon locations in Pittsburg, Concord and Walnut Creek. The TMP serves to meter through traffic along the corridor, while allowing cross-street traffic full access.

counts and travel-time runs should be conducted in the corridor after implementation to determine whether the traffic management strategy is having the desired effect and without unnecessarily large negative impacts in terms of queues at the metering signals.

Local success of gateway constraint and traffic management strategies to maintain downstream roadway capacity for Lamorinda is dependent on maintaining local control of decisions and signal operations. Gateway constraints and traffic management strategies considered for specific routes within Lamorinda shall be determined only by a policy decision made by the locally elected board having control over the gateway in question, after having undertaken a thorough public review process.

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