TRI-VALLEY TRANSPORTATION COUNCIL

Final

Tri-Valley Transportation Plan and Action Plan for Routes of Regional Significance

Prepared By:

DKS

1970 Broadway Suite 740
Oakland, CA 94612

Prepared For:
Tri-Valley Transportation Council

September 2017

Tri-Valley Transportation Plan and Action Plan Update

Final

Prepared by:

DKS

1970 Broadway, Suite 740
Oakland, CA 94612

September 2017

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

This page intentionally left blank

1 INTRODUCTION

1.1 Overview of the Tri-Valley Transportation Plan and Action Plan Update

The Tri-Valley Transportation Council (TVTC) – made up of the Cities of Dublin, Livermore, Pleasanton and San Ramon, the Town of Danville, and the Counties of Alameda and Contra Costa – adopted its first Tri-Valley Transportation Plan/Action Plan (the TVTC Plan) in 1995 as a guide for transportation planning throughout the Tri-Valley. That first TVTC Plan identified a coordinated approach to addressing the pressing transportation problems in the Tri-Valley, including a list of projects and programs needed to address them. Besides coordinating the development of those projects and programs, the TVTC Plan led to the adoption of the Tri-Valley Transportation Development Fee (TVTDF) which provides funding for some of the key projects included in the plan.

The 2014 TVTC Plan is the third major update. It first reassesses transportation issues within the Tri-Valley area, then refines the vision statements, goals, policies, and objectives, and finally, updates the actions, measures, programs, and projects that will help to achieve the plan objectives. The TVTC Plan also constitutes the Action Plan for Routes of Regional Significance for Contra Costa jurisdictions, as mandated by Measures C and J, and provides information that can be incorporated into the Congestion Management Programs for Contra Costa and Alameda Counties.

As the transportation plan for the Tri-Valley, many of the recommendations and goals in the TVTC Plan are either incorporated into or consistent with the transportation plans prepared by both the Contra Costa Transportation Authority (CCTA) and the Alameda County Transportation Commission (ACTC). In addition, the TVTC joint powers agreement states that member jurisdictions are to consider the TVTC Plan when adopting or amending general plans, specific plans, zoning ordinances, or capital improvement programs. The TVTC Plan is intended to be congruent with, and does not override, existing policies, agreements, and regulations that exist in each jurisdiction or between jurisdictions. For Contra Costa County jurisdictions, the TVTC Plan also fulfills the requirement that each city and town participate in a multi-jurisdictional, cooperative planning process, to be conducted through the Regional Transportation Planning Committee (RTPC). The TVTC Plan and the other Action Plans prepared for subareas in Contra Costa will also form the foundation for a 2014 update of the Contra Costa Countywide Transportation Plan.

The TVTC Plan underwent a focused update in 2000. Another update was undertaken in 2009 that reflected the passage of Measure J in Contra Costa. Since then, new demographic, land use, and travel forecast data have become available. A Sustainable Communities Strategy (SCS) was developed by the Association of Bay Governments (ABAG), the Metropolitan Transportation Commission (MTC), and the Bay Area Air Quality District (BAAQMD) to achieve state-mandated greenhouse gas reductions for the Bay Area; that strategy was the basis for Plan Bay Area, a new Regional Transportation Plan. The SCS and Plan Bay Area identified Priority Development Areas throughout the region where future growth was to be concentrated. All of these events combined have triggered the need to revisit the TVTC Plan to reflect changes in traffic, finance, and policy.

1.2 Elements of an Action Plan

In 1988, Contra Costa County voters approved Measure C, a one-half percent sales tax that generated $1 billion in funding over 20 years. Measure C also included an innovative Growth Management Program (GMP) that encouraged local jurisdictions to participate in a cooperative, multi-jurisdictional planning pro-

cess, and, among other things, establish flexible traffic service standards for Regional Routes. In November 2004, Measure J was passed by the voters of Contra Costa, extending the sales tax program and the GMP for another 25 years. The Contra Costa Transportation Authority, created to manage this program, allocates 18 percent of the sales tax revenue it receives to local jurisdictions that comply with Measure C and J Growth Management Program requirements. To receive these funds, each Contra Costa jurisdiction must, among other requirements, participate in an ongoing cooperative, multi-jurisdictional planning process. As a part of this process, "Action Plans for Routes of Regional Significance" are to be developed by the Regional Transportation Planning Committees (RTPC) with input from local jurisdictions. The TVTC, composed of elected officials from the seven member jurisdictions (Danville, San Ramon, Dublin, Pleasanton, Livermore, Contra Costa County, and Alameda County), serves as the RTPC for the Contra Costa County portions of the Tri-Valley subregional area.

Each Action Plan must:

1. Identify Routes of Regional Significance,

2. Set Multimodal Transportation Service Objectives (MTSOs), and

3. Establish Actions for meeting those MTSOs and local responsibilities for carrying them out

In addition, local jurisdictions and the RTPCs are to establish thresholds that trigger the evaluation of the impacts of major developments and General Plan amendments for their effects on the local and regional transportation system and the ability to achieve the MTSOs established in the Action Plan. The Tri-Valley Action Plan extends beyond Danville, San Ramon, and Contra Costa County to include Alameda County, Dublin, Pleasanton, and Livermore because of an agreement between all of the Tri-Valley jurisdictions in 1995 to combine the development of Action Plans for the subarea with a Tri-Valley Transportation Plan. This agreement has continued with each update of the Action Plan since that date.

1.3 The 2014 Action Plan Update

The 2014 TVTC Plan Update focuses on updating the growth management components to the plan that are required for the Contra Costa jurisdictions to comply with the Measure J GMP. In addition, changes have been reflected for the Alameda jurisdictions with regard to new project priorities and funding opportunities. During the course of the 2014 Update, the TVTC reviewed and updated several major elements of the Action Plan, including the Vision, Goals and Policies; Routes of Regional Significance; Multimodal Transportation Service Objectives (MTSOs); Actions; the Sub-regional Transportation Impact Fee; and Development Review Procedures. The TVTC identified six new Routes of Regional Significance or extensions of existing Routes, all of which had been identified as "Future Routes" in previous plans. TVTC also identified the Iron Horse Trail as a Route of Regional Significance. MTSOs and Actions were identified for the new routes and extensions.

Vision, Goals and Policies of an Action Plan help guide its overall direction. Decisions regarding investments, program development, and development approvals are based on these policies.

Routes of Regional Significance are roadways or other transportation facilities that are considered to be important from a regional perspective, providing regional mobility and connecting multiple jurisdictions. While the designation of Routes of Regional Significance is the responsibility of the RTPC, they are generally routes that carry significant through traffic, connect two or more jurisdictions, serve major transportation hubs, or cross county lines. For these roadways, the RTPCs use the Action Plan to establish quantifiable performance measures called MTSOs.

Multimodal Transportation Service Objectives (MTSOs) represent quantifiable performance measures that are to be maintained or met within a specific timeframe. This may include, for example, average peak-hour speeds, peak-period congestion duration, and roadway level of service.

Actions are the specific actions, measures, or programs that the jurisdictions in Tri-Valley agree to in order to achieve the MTSOs. The responsibility of carrying out the actions may be at the local jurisdiction level or at the RTPC level. Actions may involve implementing specific projects at the local level, or they may call for the RTPC to support region-wide projects that have a local impact. (Note: Contra Costa jurisdictions are required to carry out these actions in order to be found in compliance with the Measure C/J GMP).

Sub-regional Transportation Mitigation Program (STMP) is the regional transportation fee program adopted by TVTC to generate revenues to fund transportation improvements within the Tri-Valley that are necessary to mitigate the impact of new growth.

Development Review Procedures are agreements about how General Plan amendments or major development projects proposed by local jurisdictions will be reviewed by the jurisdictions and TVTC to determine whether the development proposal adversely affects the ability to meet the adopted MTSOs.

1.4 Outline of the Document

Chapter 2 of this document describes the framework for the Transportation Plan and Action Plan, identifying vision, goals and policies to guide the 2014 Transportation Plan and Action Plan, the Routes of Regional Significance and the updated MTSOs. **Chapter 3** provides a description of the existing transportation conditions in the Tri-Valley. An assessment of the MTSOs from recent monitoring is used to indicate the current status of transportation conditions in the Tri-Valley.

A forecast of 2040 population, employment, and transportation conditions is presented in **Chapter 4**. In this chapter an assessment of the Routes of Regional Significance MTSOs is provided for the 2040 forecast for a baseline condition that assumes only currently funded transportation improvements are in place.

Chapter 5 of the Plan defines the key elements of the 2014 Transportation Plan and Action Plan. This includes an updated description of the Transportation Plan elements and the actions defined by the Action Plan Update to maintain the MTSOs for the Routes of Regional Significance. The actions include "regionally significant actions," designed to improve conditions throughout the Tri-Valley, and actions specifically designed to address needs on individual Routes of Regional Significance. For each action, the agency or agencies responsible for implementing the action is identified.

The financial plan for meeting the needs of the Transportation Plan and Action Plan is presented in **Chapter 6**. This includes a brief description of the existing funding sources that support the transportation plan elements and the Sub-regional Traffic Impact Fee Program designed to implement, "regionally significant projects," in the Action Plan. This chapter also provides a description of an agreement for cost sharing of transportation improvements that are necessary to mitigate the impact of development in more than one jurisdiction.

Chapter 7 provides guidance on implementation of the Transportation Plan and Action Plan. The chapter includes a description of the process for Plan adoption and amendment. It defines a process and schedule for monitoring and reporting

the MTSOs. The chapter defines the agreed-upon procedures for review of developments and general plan amendments. The chapter provides a method for conflict resolution and identifies the future role of the TVTC in monitoring, implementing, and updating the Transportation Plan and Action Plan.

2 FRAMEWORK FOR THE TRANSPORTATION PLAN AND ACTION PLAN

2.1 Statements of Vision, Goals and Policies

The 2014 Transportation Plan and Action Plan vision, goals, and policies are as follows:

1. Integrate transportation planning with planning for air quality, community character, and other environmental factors.

2. Support corridor management programs to make the most efficient, effective, and safe use of existing facilities and services.

3. Support incident management programs to maintain mobility when accidents or breakdowns occur on major transportation facilities.

4. Consider both the need for vehicular mobility and congestion reduction, and such livability concepts as walkability, bicycle access, and community character.

5. Maintain and actively pursue enhanced and expanded public transit service, ridesharing, and non-motorized mode options and trip reduction programs in order to increase accessibility, to increase the transit share of travel in the Tri-Valley, and to increase average vehicle occupancy.

6. Provide support for Priority Development Areas.

7. Manage school-related traffic to enhance safety and reduce peak period traffic impacts.

8. Classify the Routes of Regional Significance as either interregional or intraregional in order to recognize the different trip types served on each Route. Interregional Routes provide linkages between the Tri-Valley and other sub-areas and include I-680, I-580, SR-84, Vasco Road, and Crow Canyon Road. Intraregional Routes connect communities within the Tri-Valley and include all other Routes of Regional Significance.

9. Maintain established MTSOs on Routes of Regional Significance.

10. Maintain established capacity constraints to limit interregional traffic at Tri-Valley gateways on I-580, I-680, Crow Canyon Road, and Vasco Road.

11. Encourage through-trips and interregional travel to stay on Interregional Routes and discourage diversion of these trips to intraregional routes as a mechanism for ensuring intraregional mobility.

12. Recommendations from the SR 239 Study should adhere to the TVTC Gateway Constraint Policy.

13. Support arterial traffic management strategies that address hotspots at critical intersections and approaches.

14. Respect past regional commitments in the prioritization of funding of projects.

15. Work cooperatively with regional transportation partners to maximize funding opportunities.

16. Maintain transportation funding for transportation projects.

2.2 Routes of Regional Significance

All freeways and many major arterials are designated as Routes of Regional Significance, but it is up to the individual RTPC to establish these routes for incorporation into the Authority's Countywide Plan. The CCTA's Implementation Guide provides the following criteria for identifying Routes of Regional Significance[1]:

1. Connect two or more subareas;

2. Cross county boundaries;

3. Carry a significant amount of through traffic; or

4. Provide access to a regional highway or transit facility (e.g. a rail station, a multimodal public transit facility, a bus transfer center, or a freeway interchange).

Transportation facilities that meet one or more of these criteria may be designated as Regional Routes.

Three state highways provide access to and from the Tri-Valley. These highways include Interstate 680, Interstate 580, and State Route 84. In addition, a number of arterial roadways facilitate travel within the Tri-Valley, connecting individual cities as well as carrying local traffic. The Iron Horse Trail is also important to regional pedestrian and bicycle mobility and requires interjurisdictional planning. The three state highways, along with numerous arterials and the Iron Horse Trail together make up what are known as Routes of Regional Significance, as shown in Tables 1 and 2 and in Figure 1. These routes have been further classified as either interregional or intraregional in order to recognize the different trip types served on each route. Interregional routes provide linkages between the Tri-Valley and other sub-areas and include I-580, I-680, SR-84, Vasco

[1] Contra Costa Transportation Authority, Implementation Guide, December 1990, p. IG-10.

Road and Crow Canyon Road. Intraregional routes connect communities within the Tri-Valley and include all other Routes of Regional Significance. It should be noted that designation as a Route of Regional Significance does not imply any intended change in use of the route.

Table 1: Interregional Routes of Regional Significance

Interregional Route
I-580
I-680
State Route 84
Vasco Road
Crow Canyon Road

Table 2: Intraregional Routes of Regional Significance

Intraregional Routes	
Alcosta Boulevard	Jack London Boulevard
Bernal Avenue	San Ramon Road
Bollinger Canyon Road	San Ramon Valley Boulevard
Camino Tassajara	Santa Rita Road
Danville Boulevard	Stanley Boulevard
Dougherty Road	Stoneridge Drive
Dublin Boulevard	Sunol Boulevard
Fallon Road	Sycamore Valley Road
First Street/Railroad Avenue	Tassajara Road
Hopyard Road	Vasco Road
Iron Horse Trail	

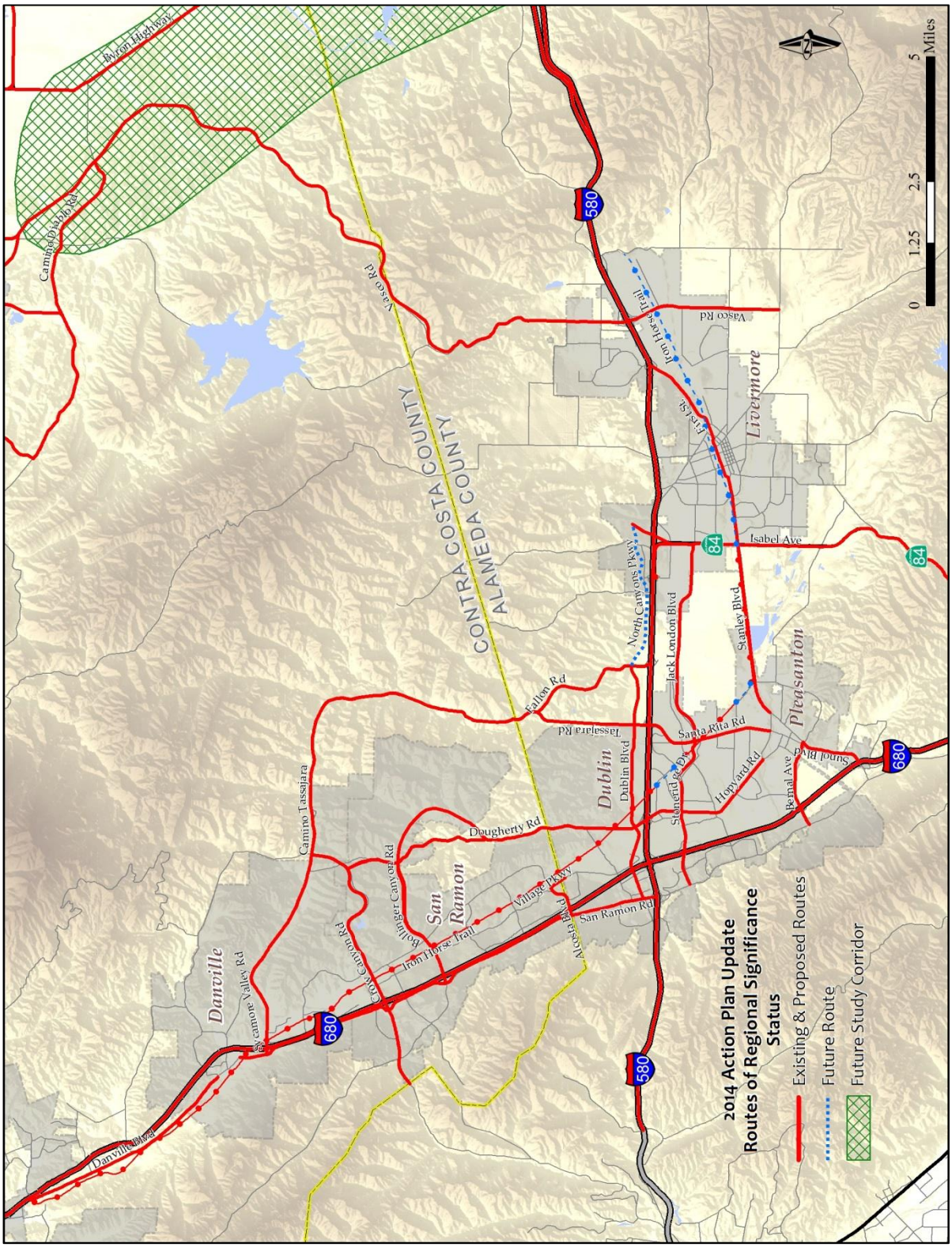


Figure 1: Tri-Valley Routes of Regional Significance

2.3 Multimodal Transportation Service Objectives

Multimodal Transportation Service Objectives (MTSOs) provide a mechanism for the jurisdictions within the Tri-Valley to define the quality of service that is desired on Routes of Regional Significance. The following MTSOs are defined for Tri-Valley Routes of Regional Significance:

Peak Hour Travel Speed. This measure, applied only to I-580 and I-680, sets a minimum average peak hour speed for the AM and PM peak hours. The target minimum speed is 30 miles per hour.

Delay Index. The Delay Index (DI) compares the time required to travel between two points during the peak hour to the time required during non-congested, off-peak hours. This measure is defined as the observed travel time divided by the free-flow travel time:

Delay Index (DI) = (Observed Travel Time) ÷ (Free-Flow Travel Time)

The target minimum value for the Delay Index for I-580 and I-680 is 2.0, A DI of 2.0 indicates that a trip though the segment takes twice as long during peak hours as during the off-peak, due to congestion and slow speed. The proposed target minimum value for SR-84 is 3.0.

Duration of Congestion. This MTSO is expressed in terms of hours of congestion per day. Hours of congestion can be measured with traffic counts or speed runs and should apply to mixed-flow lanes only. A target value has been set only for I-680 south of SR-84 because of the high commute volume and level of congestion on that portion of I-680. A target value of no more than five (5.0) hours of congestion per day has been set.

Intersection Levels of Service. Level of service is a measure of the amount of delay that results from volume on a particular facility. For intersections, the delay is a function of the volume of all of the through movements and turning movements at the intersection as well as the number of lanes serving each movement and traffic signal timing. For the purpose of this MTSO, the level of service is defined by an assessment of control delay and volume-to-capacity ratio for the intersection and is calculated using the *2010 Highway Capacity Manual* operational method for AM and PM peak hours based on turning-movement counts. The target for this MTSO is to maintain an intersection level of service "E" or better. In local juris-

dictions where LOS standards for downtown areas have been established for Routes of Regional Significance, the LOS in the adopted General Plan shall govern.

Previous Action Plans used a link level of service measure as the MTSO for SR-84 but this has been changed to a combination of the Delay Index and the intersection level of service.

Previous versions of the Transportation Plan and Action Plan also identified goals for reducing reliance on the automobile. These goals provide input for the planning process but are not used in the evaluation of performance on the Routes of Regional Significance.

Transit Ridership. Public transit agencies routinely collect ridership data for their system on a daily, monthly, and annual basis. Most transit agencies now have Automatic Passenger Counters, which, along with farebox data provide an extremely accurate account of all boardings and alightings on a granular level. With this new technology, public transit usage can be attributed to specific routes, bus stops, and times of day. No specific goal for transit ridership has been specified.

Average Vehicle Ridership (AVR). This measure is the ratio of total person commute trips to vehicles used for commuting on I-580 and I-680. The Tri-Valley Transportation Plan/Action Plan includes a regional action to increase AVR by 10% from 1.1 to 1.2. Several Tri-Valley jurisdictions maintain voluntary employer trip reduction programs to increase AVR.

MTSOs have also been formulated for the Iron Horse Trail, which is designated a Route of Regional Significance. These MTSOs will be monitored in subsequent updates of the Plan. The following MTSOs are defined for the Iron Horse Trail:

Pedestrian and Bicycle Volumes – A measure of the use of the facility and potential overcrowding or conflict.

Auto Volumes at Crossings – A measure of the difficulty crossing roadways along the trail.

Average Trail User Delay at Major Road Crossings – A measure of the delay to trail users caused by at-grade crossings of the trail.

Frequency of Pedestrian or Bicyclist Injury – A measure of the relative safety of the trail for its pedestrian and bicycling users.

Pavement Condition - A measure of the relative comfort of the trail for its users.

3 EXISTING TRANSPORTATION CONDITIONS

3.1 Traffic Volumes and Conditions

An evaluation of the values of the MTSOs for the Routes of Regional Significance provides an overview of the existing traffic conditions in the Tri-Valley. Table 3 summarizes the results of the monitoring.

Table 3: Status of Existing MTSOs

MTSO	*Standard*	*Facilities*	*2013 Monitoring*
Peak Hour Travel Speeds	Minimum average speed of 30 miles per hour	I-680	AM: 56.3 mph (NB), 56.8 mph (SB) PM: 44.5 mph (NB), 58.5 mph (SB)
		I-580	AM: 62.4 mph (EB), 35.2 mph (WB) PM: 48.6 mph (EB), 59.3 mph (WB)
Delay Index	Delay index of 2.0 or less	I-680	AM: 1.1 (NB), 1.1 (SB) PM: 1.3 (NB), 1.0 (SB)
		I-580	AM: 1.0(EB), 1.7 (WB) PM: 1.2(EB), 1.0 (WB)
	Delay index of 3.0 or less	SR-84	AM: 1.7 (NB), 1.9 (SB) PM: 1.7 (NB), 1.6 (SB)
Congestion Duration	No more than 5 hours of congestion per day south of SR-84	I-680	NB: 4 hours SB: 3 hours
Intersection Level of Service	LOS "E" at signalized intersections No standard in downtown areas	87 intersections	LOS F (both AM & PM peak, unless noted) at: 1. Dougherty Rd/Amador Valley Rd 2. Santa Rita Ave/Valley Ave (PM) 3. Stanley Blvd/Valley Ave (PM) 4. Danville Blvd/Livorna Rd (AM) 5. Danville Blvd/Stone Valley Rd (PM) 6. Bollinger Canyon Rd / Camino Ramon 7. Bollinger Canyon Rd / Alcosta Blvd (PM)

Source: 2013 CCTA MTSO Monitoring Report

3.2 Traffic Speed and Delay

The existing speeds on several Regional Routes of Significance were used to calculate the delay index. The model provided speeds for the future scenario, and these were used to calculate the respective delay index.

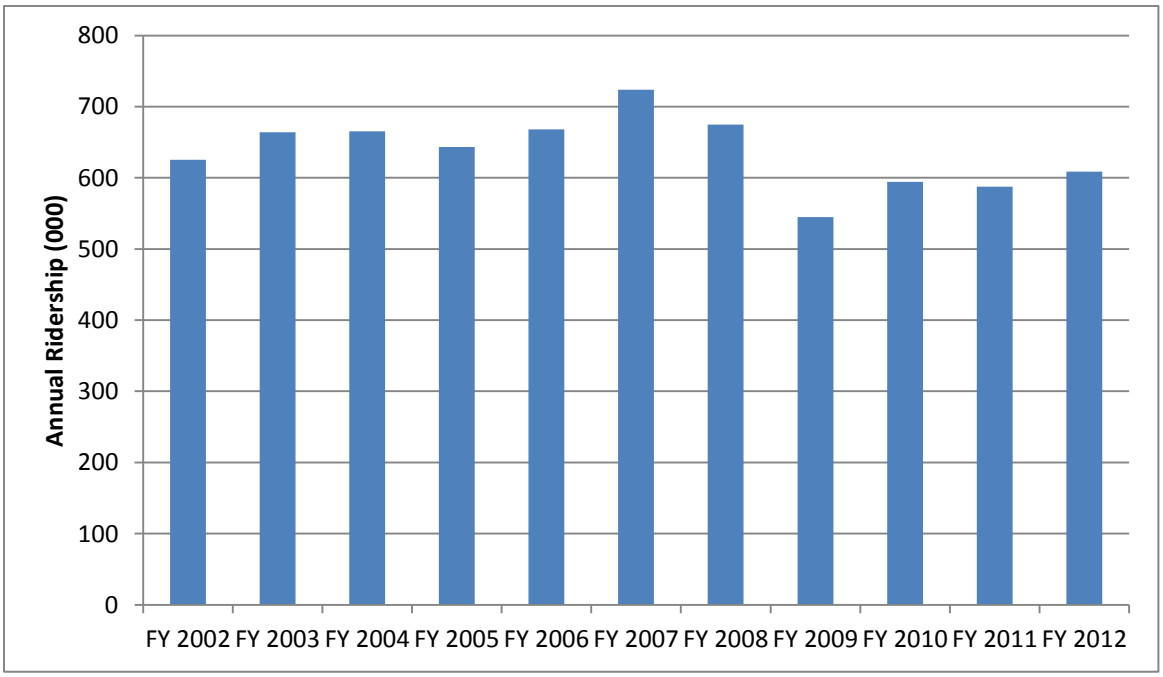
3.3 Public Transit Service

Public transit service in the Tri-Valley is provided by Contra Costa County Connection (CCCTA), Bishop Ranch Express (operated by CCCTA), the Livermore

Amador Valley Transit Authority (LAVTA), the Altamont Commuter Express (ACE), the San Francisco Bay Area Rapid Transit District (BART), and some limited Contra Costa County service by SolTrans (Solano County Transit). Public transit ridership has seen modest gains in recent years, with impacts of the economic downturn affecting funding and usage.

Contra Costa County Connection serves the Contra Costa County portion of the Tri-Valley, the Dublin/Pleasanton BART Station and the Alameda County Fairgrounds ACE Station. The bus routes currently serving this area are 21, 35, 36, 92X, 95X, 96X, 97X, and 321. County Connection also provides service between the ACE Station in Pleasanton, the San Ramon Transit Center and the Bishop Ranch Business Park. Ridership on Tri-Valley area routes had dropped in 2008 and 2009 after peaking in 2007, and is recovering in the years after, as shown in Figure 2. Figure 3 identifies the locations of these routes.

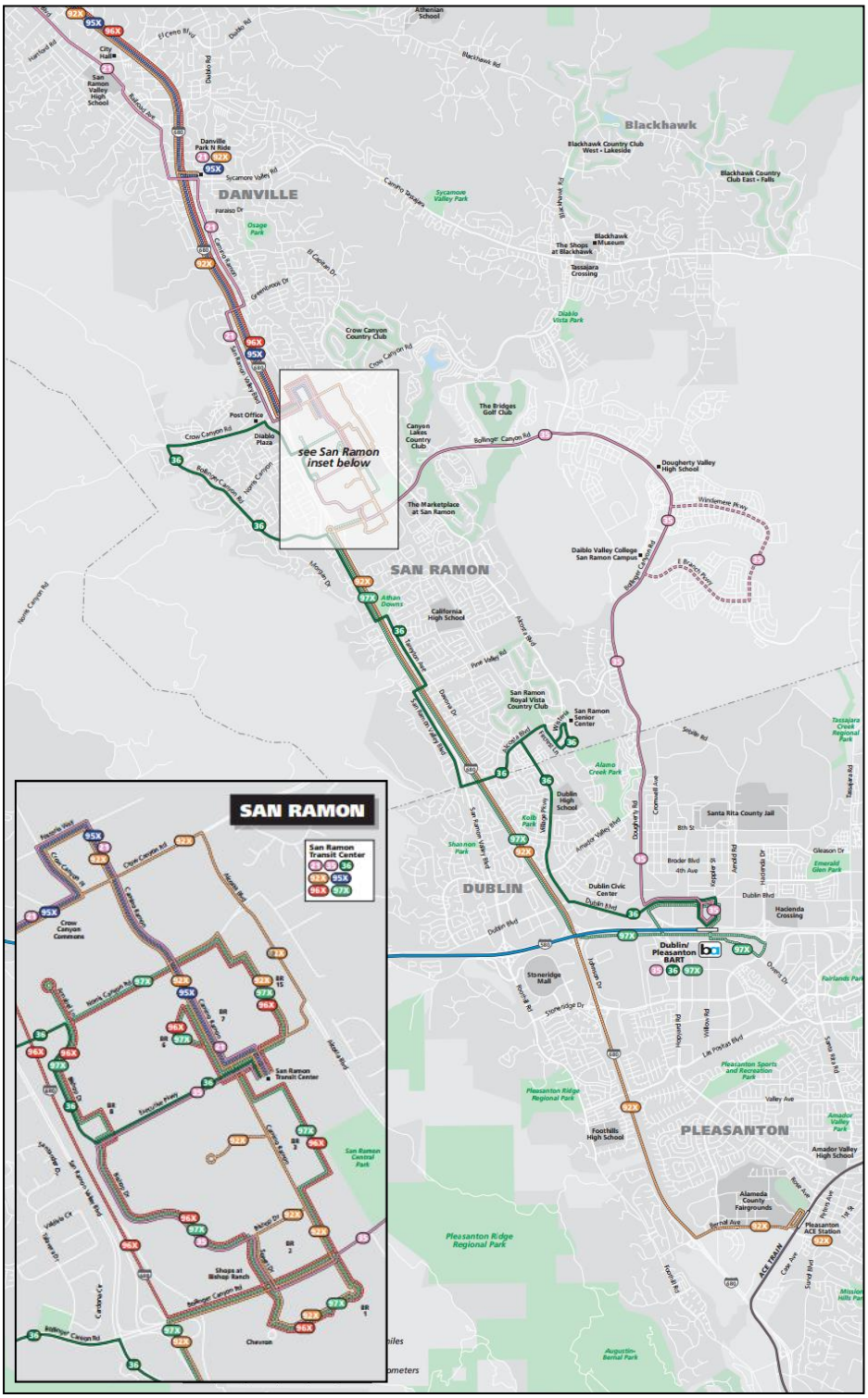
Figure 2: Annual Ridership for County Connection Tri-Valley Bus Routes



Source: County Connection, November 2013

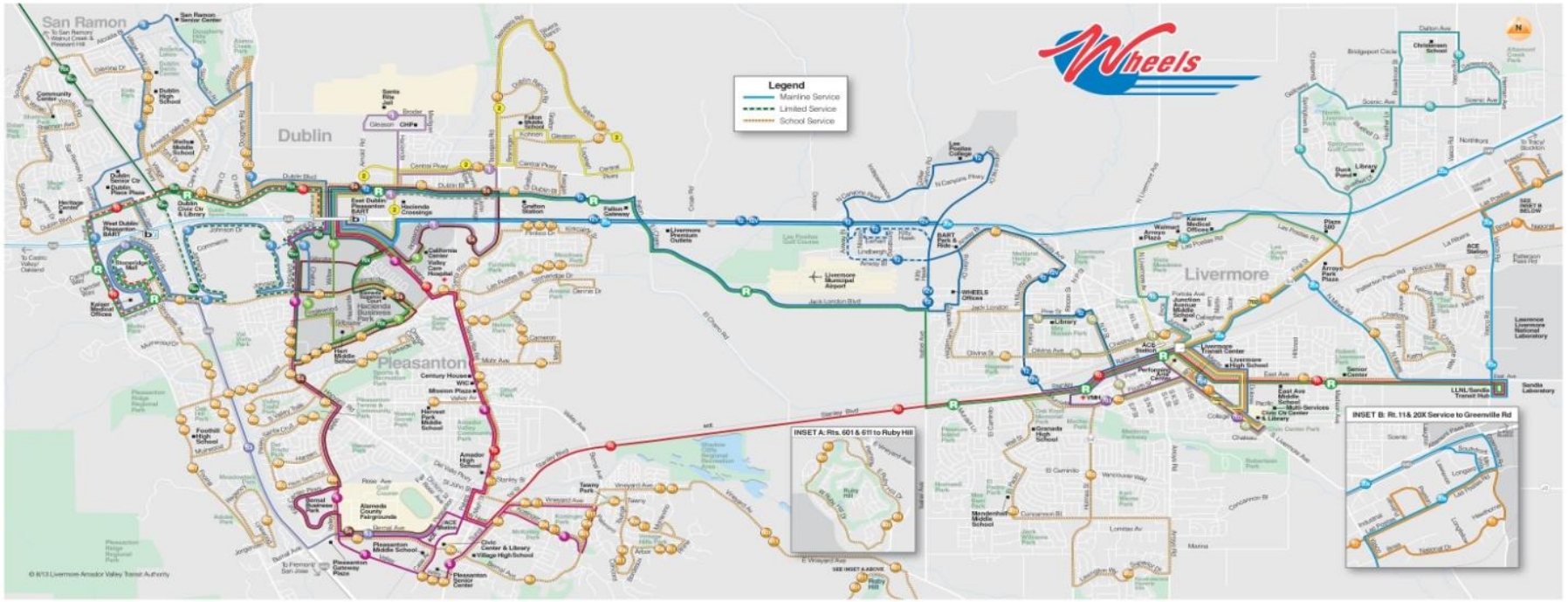
In the Alameda County portion of the Tri-Valley, LAVTA is the primary public transit provider, serving Dublin, Pleasanton, and Livermore, as illustrated in Figure 4. LAVTA's services include: one BRT/Rapid Route; four express bus routes; nine local routes; three shuttles; and 20 limited service routes, including service to schools, and demand-responsive paratransit service. As shown in Figure 5, LAVTA's fixed route ridership has been relatively static over the last three years during the economic downturn.

Figure 3: County Connection System Map (Tri-Valley area)



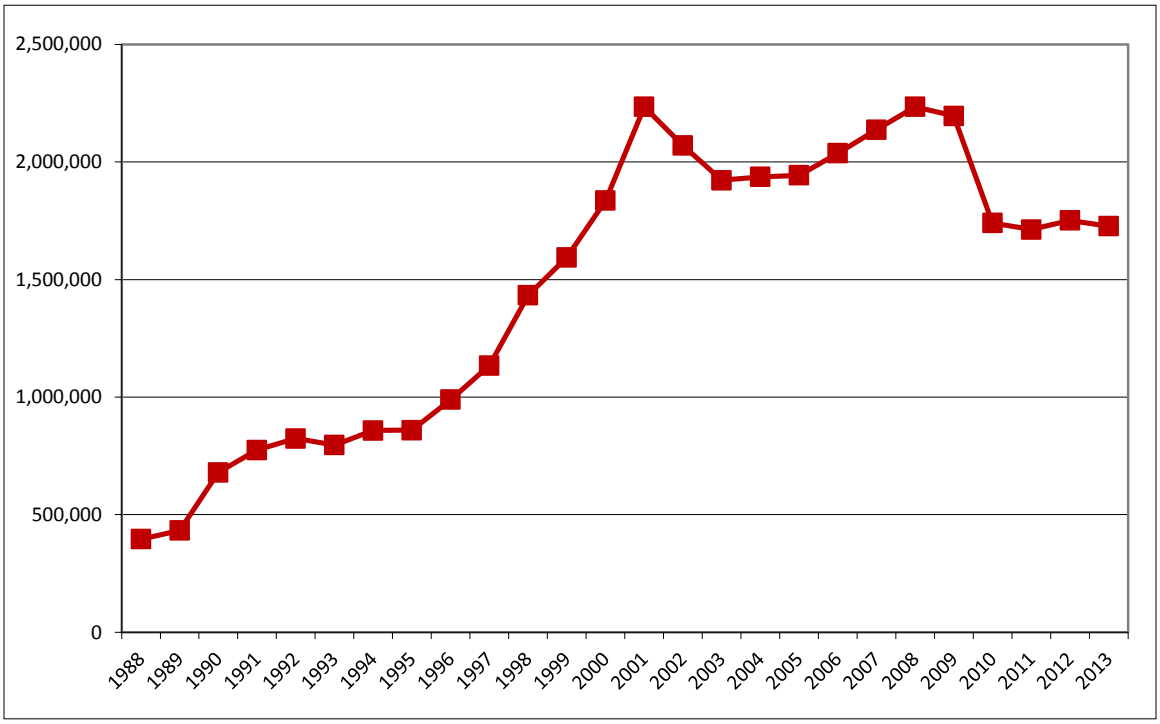
Source: County Connection, July 2013

Figure 4: LAVTA System Map



Source: LAVTA August 2013 Bus Book

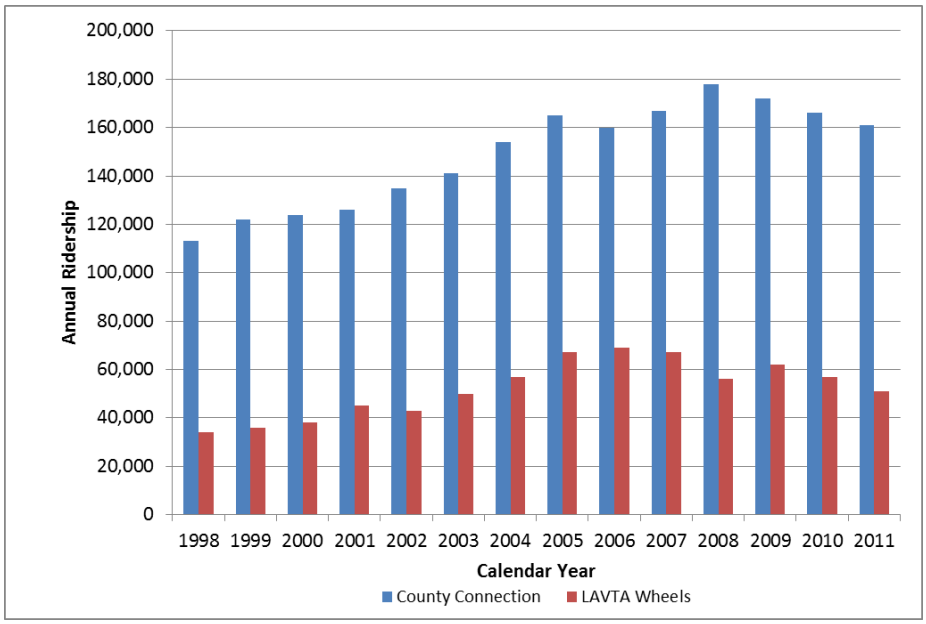
Figure 5: Annual Ridership for LAVTA Fixed Route Bus Service, FY 1987-2013



Source: LAVTA System Ridership, 2013

Paratransit services within the Tri-Valley area are provided by County Connection, LAVTA, and a few select non-profit groups. Overall ridership on paratransit in the Tri-Valley, as shown in Figure 6, had been steadily rising until it peaked in 2008 and has been decreasing since then. LAVTA has seen expected gradual increases in paratransit usage over the last 24 months. With population forecasts showing a large increase in the senior (age 62 and over) demographic, the demand for paratransit service is expected to increase again in the future.

Figure 6: Annual System Wide Paratransit Ridership

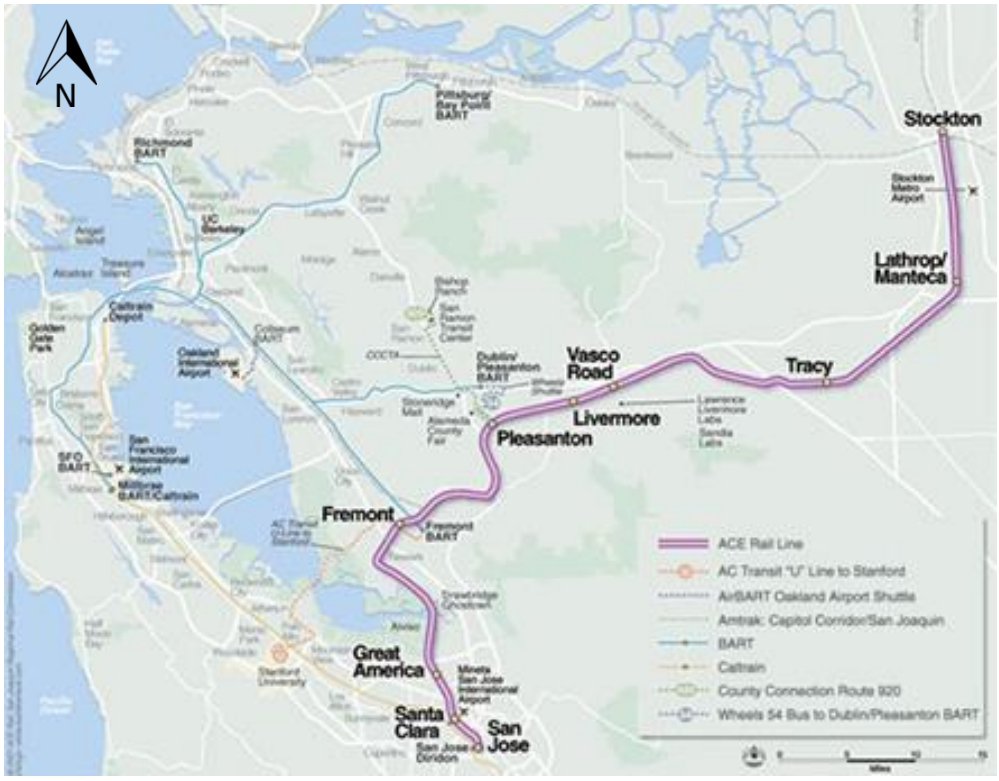


Source: 2011 MTC Statistical Summary of Bay Area Transit Operators

Providing commuter rail service from Stockton to San Jose, ACE Rail serves the Tri-Valley with two stops in Livermore and another in Pleasanton. After service began in 1998, it was expanded to four round-trip trains, and then reduced to three round trip-trains due to budget shortfalls. Service has since been restored to four round-trip trains. The complete route and stations served are shown in Figure 7. ACE Rail ridership peaked in 2000, steadily recovered through 2008, and experienced a drop in 2009. Ridership has since recovered to 2008 levels. Figure 8 shows the ridership trends since 1998.

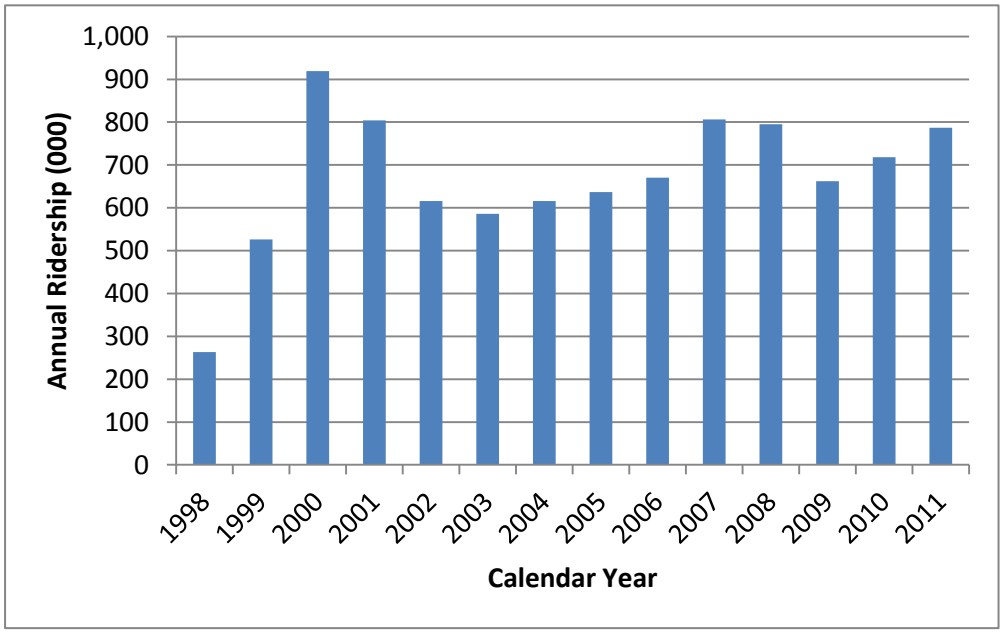
Plans have been developed for the enhancement of ACE service over the next ten years. The plan, ACEforward, is aiming to offer more service (six daily round-trips by 2018 and ten daily round-trips by 2022, versus the current four daily round trips) and safety improvements such as grade crossings and additional track in key locations. The plan also calls for extending ACE service to the down-towns of Manteca, Modesto, Turlock, and Merced and could potentially move ACE to downtown Tracy.

Figure 7: ACE Rail System Map



Source: ACE Rail, July 2013

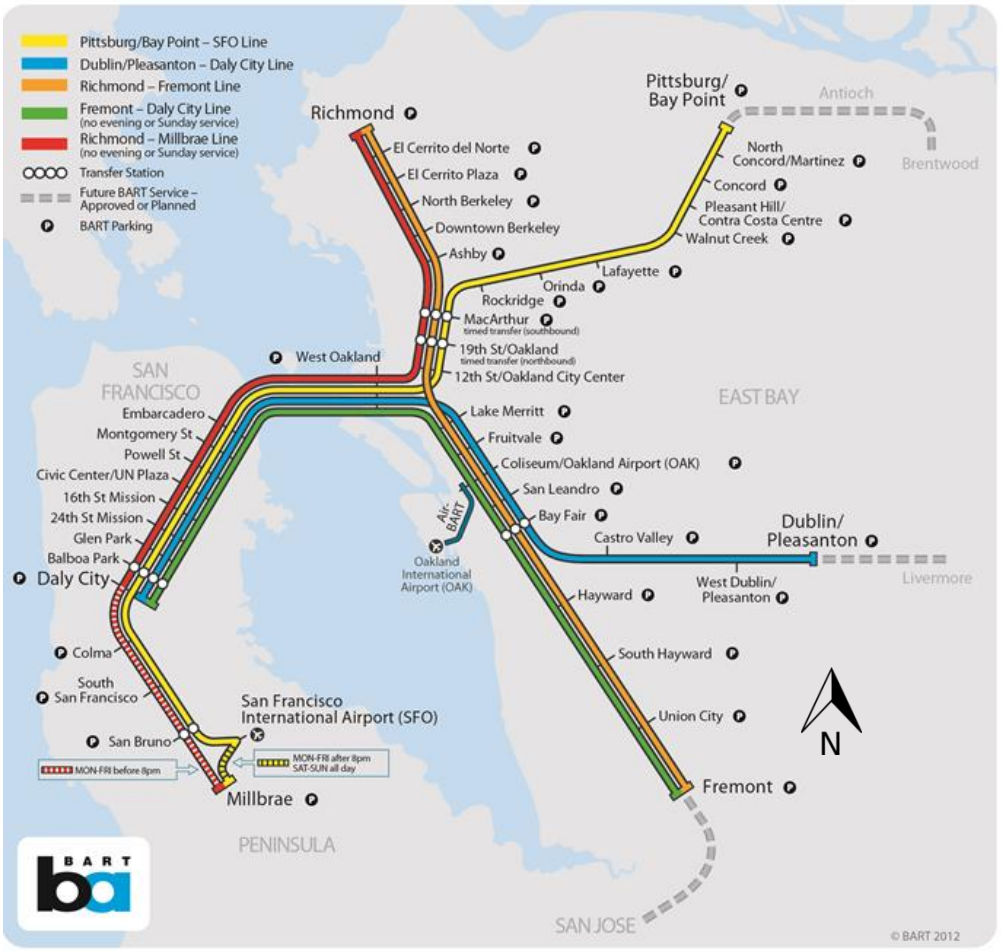
Figure 8: Annual Ridership for ACE Rail



Source: 2011 MTC Statistical Summary of Bay Area Transit Operators

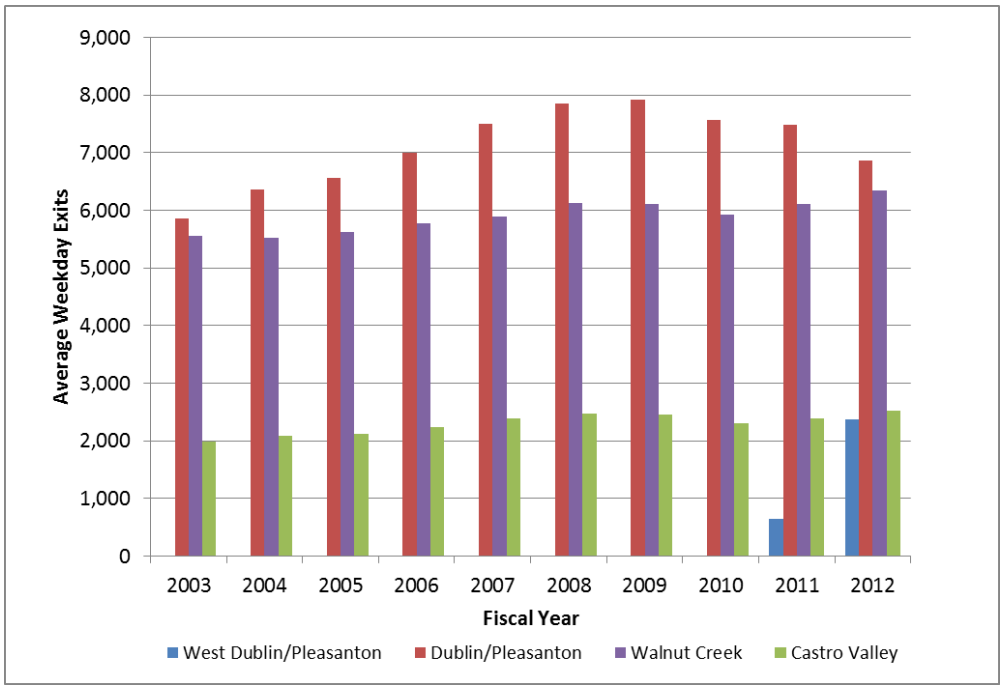
BART service to the Tri-Valley is provided at the West Dublin/Pleasanton and Dublin/Pleasanton BART stations. The stations can be accessed through on-site park-and-ride lots and through numerous County Connection and LAVTA bus routes. A map showing the BART system is presented in Figure 9. Ridership in the form of average annual weekday exits at the West Dublin/Pleasanton and Dublin/Pleasanton stations, along with the nearby Walnut Creek and Castro Valley stations, is shown in Figure 10. The most apparent trend is a significant increase in ridership at the Dublin/Pleasanton station from FY 2003 to 2009 and a steady decline in recent years due, at least partially, to the opening of the new West Dublin/Pleasanton Station in 2011. Overall, ridership has steadily increased since FY 2003.

Figure 9: BART System Map



Source: BART, July 2013

Figure 10: Average Annual Weekday Exits at Select BART stations



Source: BART 2013 Ridership Report

3.4 Conclusions about Existing Transportation Conditions

Looking back at the original Action Plan adopted by TVTC in 1995, it is striking to note that the Plan indicated that there was very little congestion on the Tri-Valley's arterial and freeway network. Today, we see not only significant congestion, but also continued rapid growth that is expected to cause still greater levels of traffic congestion in the future. To continue to meet the MTSOs, new actions and measures may be required. It is important to note, however, that inability to achieve the MTSOs does not of itself constitute non-compliance with the Contra Costa GMP. Exceeding an MTSO does, however, suggest that the Action Plan may need to be re-evaluated to determine whether the MTSOs needs to be adjusted, or whether new actions can be introduced to address incidents of exceeding an MTSO.

Transit is playing an important role in the region, but transit ridership is not growing at as fast a rate as population, employment, or traffic volumes. In fact, forecasts indicate a continued reliance on the single-occupant auto as the dominant mode of transit in the Tri-Valley. If the Tri-Valley is to continue to seek to meet its transportation objectives by increasing transit use and increasing vehicle occupancy, more resources will be required to increase transit service to the point where it is sufficiently attractive to achieve a higher transit mode share and higher vehicle occupancies. More resources will also be needed to enhance other

alternatives to the single-occupant vehicle such as carpooling, vanpooling, bicycling, and walking.

4 OVERALL GROWTH RATES AND FUTURE TRAVEL PATTERNS

4.1 Population and Employment Forecasts

Forecasts for future population and employment levels in the Tri-Valley were derived from the Contra Costa Transportation Authority's (CCTA) countywide travel demand forecasting model. By resolution, this model was adopted by the TVTC in 2012 for the purposes of updating the Action Plan. The traffic forecasts generated by the model are based on the Association of Bay Area Governments (ABAG) Current Regional Plan Projections produced in 2011 as part of the regional plan update and the 2013 CCTA Land Use Information System (LUIS '13). Provided in the model are forecasts for the year 2010, 2020, 2030 and 2040. Current year 2013 estimates are derived through straight-line interpolation between 2010 and 2020.

Population and employment forecasts are summarized in Tables 4 and 5. By 2040, the total Tri-Valley population is forecasted to grow 35 percent from today. Seniors (age 62 and over) are to make up most of that growth, increasing by 79 percent.

The total number of employees, or jobs, in Tri-Valley is expected to grow at a lower rate than the number of employed residents, eventually becoming roughly equal to the total number of employed residents.

Table 4: Population and Employment Forecast

	2013	*2040*	*Net Growth*	*Percent Growth*
Total Population	349,784	472,355	122,572	35%
Total Households	125,111	170,267	45,156	36%
Total Employed Residents	157,597	239,853	82,256	52%
Total Employees	183,598	239,655	56,057	31%
Average Household Size	2.80	2.77		
Employed Residents/HH	1.26	1.41		

Source: ABAG and CCTA Projections for 2013 and 2040

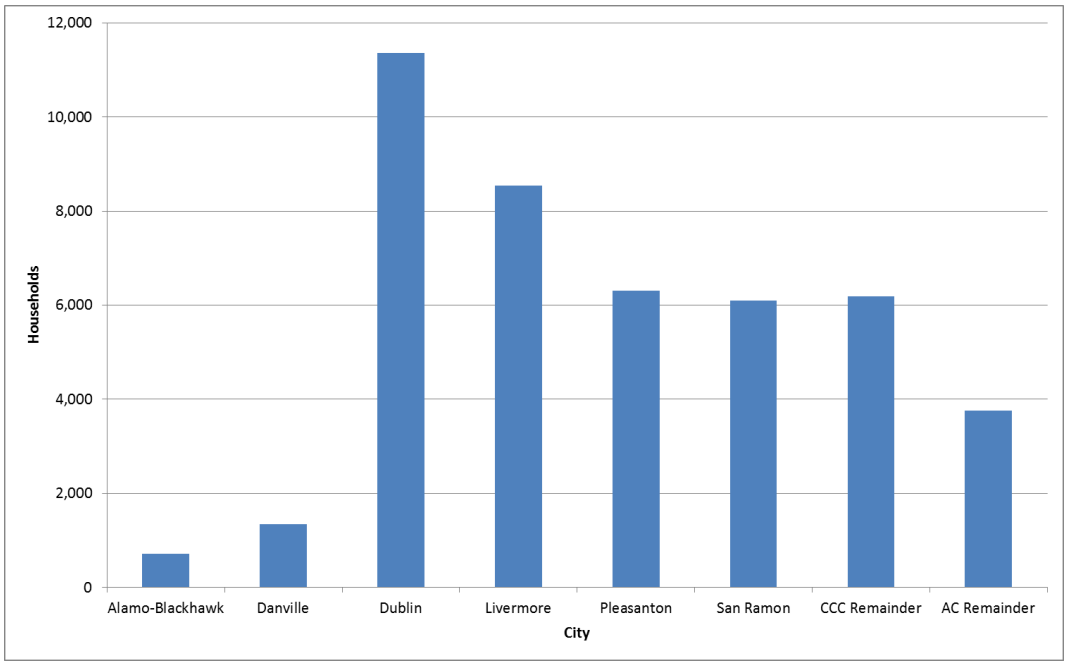
Table 5: Population Forecast by Age Group

	2013	*2040*	*Net Growth*	*Percent Growth*
Senior (Age 62+)	35,085	62,814	27,729	79%
Adult (Non-Senior)	225,218	297,756	72,539	32%
Non-working Young	89,481	111,785	22,303	25%
Total Population	349,784	472,355	122,572	35%

Source: CCTA Travel Demand Model, Projections 2013

Of the total household growth in the Tri-Valley, approximately 59 percent of it is expected to occur in Dublin, Pleasanton, and Livermore as shown in Figure 11. The communities of Alamo, Blackhawk, Danville, and San Ramon are forecasted to absorb 18 percent of the total growth while the other 23 percent is to occur in the remaining areas of Contra Costa and Alameda counties.

Figure 11: Household Growth by Area, 2013 to 2040



Source: CCTA Travel Demand Model, Projections 2013

Total employment is forecasted to grow 31 percent in the Tri-Valley by 2040, as shown in Table 6. Most of this growth is to occur in the service sector, which will account for about 39 percent of the total employment growth.

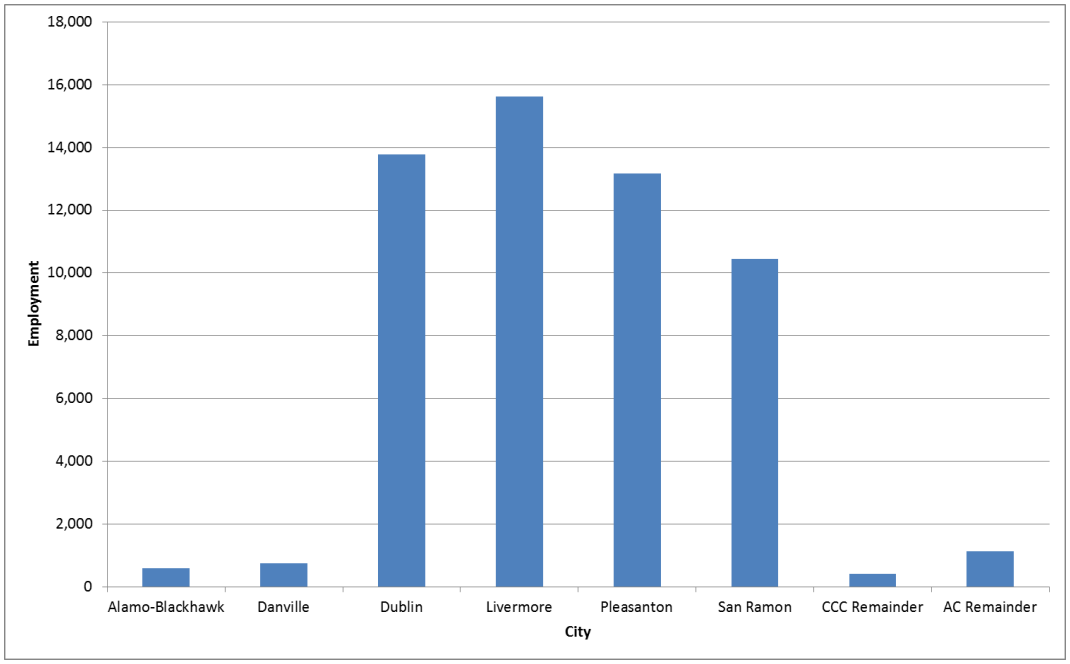
Table 6: Employment Forecast

	2013	*2040*	*Net Growth*	*Percent Growth*
Retail	26,973	39,130	12,157	45%
Service	78,844	100,602	21,758	28%
Manufacturing	17,753	23,666	5,913	33%
Agricultural	1,867	2,279	412	22%
Wholesale	8,552	12,303	3,751	44%
Other	49,608	61,675	12,067	24%
Total Employment	183,598	239,655	56,057	31%

Source: CCTA Travel Demand Model, Projections 2013

Distribution of employment growth is not expected to be even, with Dublin and Livermore accounting for 75 percent of the additional Tri-Valley jobs, as presented in Figure 12.

Figure 12: Employment Growth by Area, 2013 to 2040



Source: CCTA Travel Demand Model, Projections 2013

4.2 Traffic Forecasts

As shown in Table 7, traffic demand is expected to grow at a brisk pace along Tri-Valley area freeways and arterials. Most of the percentage growth is found along arterial roadways that, in 2000, were mostly serving undeveloped land but will now be serving residential development.

Table 7: Baseline Traffic Forecasts for Select Routes of Regional Significance

Road Name	*2013* *PM Peak Hour Volume -Peak Direction*	*2013 - 2040* *PM Peak Hour Volume Percent Growth*
I-680 (North of Diablo Road)	8140	23%
I-680 (South of SR-84)	7690	52%
I-580 (West of I-680)	7400	47%
I-580 (East of Tassajara Road)	9050	35%
I-580 (East of Vasco Road)	7600	59%
Vasco Road (At County Line)	810	11%
Stanley Boulevard (West of Isabel Avenue)	1810	2%
Bollinger Canyon Road (At Dougherty Road)	690	158%
Crow Canyon Road (at Dougherty Road)	2200	28%
Camino Tassajara (at Crow Canyon Road)	1580	10%

Source: CCTA Travel Demand Model, Projections 2013

4.3 Evaluation of MTSO Values for 2040 Traffic Conditions

A summary of the results of the analysis of MTSO values for the 2040 forecast year is presented in Table 8. More detail on the MTSO values can be found in Appendix A. Table 8 provides the results from the 2013 MTSO monitoring, values estimated for a "No Project" forecast that excludes all actions contained in the five Action Plans except those that are fully funded and programmed, and values for a "With Actions" forecast that includes all actions from the five Action Plans. This is the first time that a forecast of future year values of MTSOs for a "No Project" scenario has been presented and it does differ from the "Baseline" forecasts used in previous versions of the TVTC Plan. The "Baseline" forecasts used in the past included some but not all of the actions.

As indicated in Table 8 in the results for 2040 "No Project" (without the Action Plan actions), the growth in traffic that is expected in the Tri-Valley will result in a significant deterioration in MTSO performance with respect to intersection level of service, despite a significant investment in transportation projects and service already programmed. There is also some deterioration in freeway Speeds and Delay Index, but there is only one exceedances of the either MTSO – I-580 Westbound in the AM. It should be noted that the forecast for 2040 reflects a doubling of transit ridership in the Tri-Valley and an increase in the peak period transit mode share from about 8 percent to about 12 percent. We note, however,

that historically, the model used for the development of the TVTC Plan has tended towards over-predicting transit ridership for the Bay Area. The results for the 2040 "No Project" suggest that additional actions beyond the already programmed projects will be needed to meet the goals and objectives of the plan.

Table 8 also provides results for a 2040 forecast with all of the TVTC Plan actions described in Section 5 of this report as well as the actions of the other subareas in Contra Costa. While the actions do produce an improvement in many of the MTSOs, the results indicate that there will still be exceedances of arterial intersection MTSO despite the additional investment.

Table 8: Status of MTSOs for 2040 Baseline Forecast

MTSO	*Standard*	*Facilities*	*2013 Monitoring*	*P2011 – 2040 No Project**	*P 2011 - 2040 with Actions*
Peak Hour Travel Speeds	Minimum average speed of 30 miles per hour	I-680	AM: 56.3 (NB), 56.8 (SB) PM: 44.5 (NB), 58.5 (SB)	AM: 46.4 (NB), 52.4 (SB) PM: 39.9 (NB), 46.5 (SB)	AM: 48.8 (NB), 57.7 (SB) PM: 51.8 (NB), 50.9 (SB)
		I-580	AM: 62.4 (EB), 35.2 (WB) PM: 48.6 (EB), 59.3 (WB)	AM: 50.7 (EB), 25.7 (WB) PM: 35.0 (EB), 48.3 (WB)	AM: 51.9 (EB), 45.4 (WB) PM: 43.9 (EB), 51.9 (WB)
Delay Index	Delay index of 2.0 or less	I-680	AM: 1.1 (NB), 1.1 (SB) PM: 1.3 (NB), 1.0 (SB)	AM: 1.3 (NB), 1.1 (SB) PM: 1.5 (NB), 1.3 (SB)	AM: 1.2 (NB), 1.0 (SB) PM: 1.2 (NB), 1.2 (SB)
		I-580	AM: 1.0 (EB), 1.7 (WB) PM: 1.2 (EB), 1.0 (WB)	AM: 1.2 (EB), 2.3 (WB) PM: 1.7 (EB), 1.2 (WB)	AM: 1.2 (EB), 1.3 (WB) PM: 1.4 (EB), 1.2 (WB)
	Delay index of 3.0 or less	SR-84	AM: 1.7 (NB), 1.9 (SB) PM: 1.7 (NB), 1.6 (SB)	AM: 1.7 (NB), 1.7 (SB) PM: 1.6 (NB), 1.5 (SB)	AM: 1.6 (NB), 1.7 (SB) PM: 1.6 (NB), 1.5 (SB)
Congestion Duration	No more than 5 hours of congestion per day south of SR-84	I-680	NB: 4 hours SB: 3 hours	NB: 4 hours SB: 3 hours	NB: 4 hours SB: 3 hours

Table 8: Status of MTSOs for 2040 Baseline Forecast

MTSO	*Standard*	*Facilities*	*2013 Monitoring*	*P2011-2040 No Project*	*P2011-2040 with Actions*
Intersection Level of Service	LOS "E" at signalized intersections No standard for intersections exempt by General Plan	87 intersections	LOS F (both AM & PM peak, unless noted) at: Dougherty Rd/Amador Valley Rd Santa Rita Rd /Valley Ave (PM) Stanley Blvd/Valley Ave (PM) Danville Blvd/Livorna Rd (AM) Danville Blvd/Stone Valley Rd (PM) Bollinger Canyon Rd / Camino Ramon Bollinger Canyon Rd / Alcosta Blvd (PM)	LOS F (both AM & PM peak, unless noted) at: Isabel Ave (SR 84) / Vallecitos Rd Isabel Ave (SR 84) /E Vineyard Ave Isabel Ave (SR 84) / Concannon Blvd (AM) Dougherty Rd/ Dublin Blvd Dougherty Rd/Amador Valley Rd Tassajara Rd / Dublin Blvd (PM) Tassajara Rd/Gleason Dr Dublin Blvd / Hacienda Dr (PM) Dublin Blvd / Fallon Rd Santa Rita Rd /Valley Ave (PM) Santa Rita Rd /Stoneridge Dr Stoneridge Dr/W Las Positas Blvd Danville Blvd / Stone Valley Rd (PM) San Ramon Valley Blvd / Sycamore Valley Rd (PM) San Ramon Valley Blvd / Alcosta Blvd (AM) Crow Canyon Rd / Dougherty Rd (PM) Bollinger Canyon Rd/Camino Ramon Bollinger Canyon Rd/Alcosta Blvd Alcosta Blvd / SB I-680 off-ramp Alcosta Blvd / NB I-680 off-ramp (PM)	LOS F (both AM & PM peak, unless noted) at: Isabel Ave (SR 84) / Vallecitos Rd Dougherty Rd/ Dublin Blvd Tassajara Rd / Dublin Blvd (PM) Dublin Blvd / Hacienda Dr Dublin Blvd / Fallon Rd (AM) Santa Rita Rd /Stoneridge Dr (AM) Danville Blvd / Stone Valley Rd (PM) San Ramon Valley Blvd / Sycamore Valley Rd (PM) Stoneridge Dr/W Las Positas Ave (AM) San Ramon Valley Blvd / Alcosta Blvd (AM) Crow Canyon Rd / Camino Ramon (PM) Bollinger Canyon Rd / Alcosta Blvd Alcosta Blvd / SB I-680 off-ramp (PM) Alcosta Blvd / NB I-680 off-ramp (PM)

Source: CCTA MTSO Monitoring Report, 2013 and CCTA Travel Model, 2014

* Note – The "No Project" scenario differs from the "Baseline" scenario used in previous TVTC Plans. The "No Projects" removes all actions that are not fully funded and programmed.

5 PROPOSED TRANSPORTATION PLAN AND ACTION PLAN

5.1 Focus of the Transportation Plan

As with the previously adopted Tri-Valley Transportation Plan and Action Plan, this Update focuses on transportation improvements within the Tri-Valley, and avoids expansion of the so-called "gateways" that enter and leave the Tri-Valley. Three contributing factors have led to re-affirmation of this approach:

- **Financial Constraints** - Financial resources for all projects are limited. The Measure J and Measure B sales tax programs provide substantial funding for specific projects in Tri-Valley. Other projects must compete for the relatively small pot of public funds. Developer fees, which have an upper

limit, could help supplement public funds. Future sales tax or gasoline tax initiatives may or may not be successful.

- **Physical Limitations within Corridors** - Expansion of major corridors within Tri-Valley is limited due to existing development and terrain. These limitations hinder the development of transportation corridors other than the existing I-680 and I-580 corridors.
- **Development Patterns** - Development patterns within Tri-Valley have been geared toward relatively low housing and commercial densities. These patterns are expected to continue in the future. This development pattern is impossible to serve thoroughly with transit, given realistic funding expectations.

The TVTC Plan uses the above policy focus to create a set of actions comprising an integrated plan. The transportation plan supports the "Complete Streets" policies of the jurisdictions and is comprised of enhancement to roadway capacity coupled with increased transit service, improved pedestrian and bicycle facilities, control of demand (growth management and TDM), and acceptance of congestion in locations where it cannot be avoided. The following sections provide an overview of the plan.

5.2 Roadways

The plan includes many improvement projects for freeways, interchanges, arterials, and intersections. These are all based on the reality of *gateway constraints*.

Gateway Constraint Policy: In the development of the first Tri-Valley Transportation Plan/Action Plan in 1995, analysis of alternatives through the planning process showed that the TVTC's mobility and accessibility would not be improved by widening any of the gateways for single-occupant vehicles leading into the area.

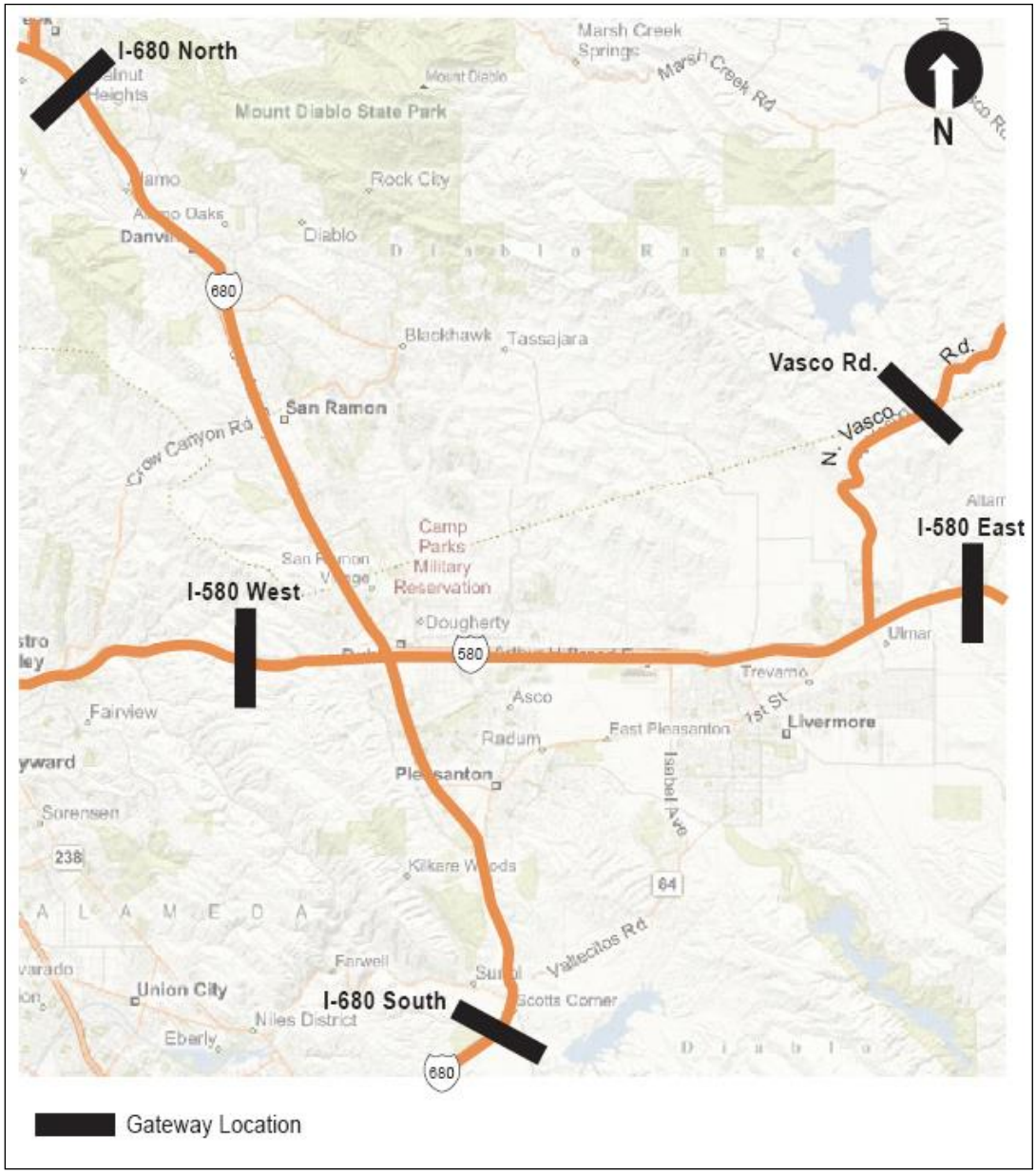
The gateways include I-680 north and south, I-580 east and west, Crow Canyon Road to Castro Valley, and Vasco Road in Alameda County. Their locations are illustrated in Figure 13. Widening of these gateways would leave the freeways congested, lead to more through traffic, and increase traffic volumes on other Tri-Valley roads. This is because of the Tri-Valley's strategic location between San Joaquin County and the Bay Area and also between Central and Eastern Contra Costa County and Santa Clara County.

The implication of gateway constraints for roadway planning is that the interior freeways and arterials should be sized to handle only what traffic can get through the gateways. Thus, the TVTC Plan recognizes that congestion will occur for several hours each weekday at the gateways, but this will have the positive effect of metering single-occupant vehicle travel to and from the area. Within the Tri-Valley area, the road system is designed to function with these gateways constrained to minimize congestion. The roadway plan, when combined with a balance between jobs and housing, and given expected financial constraints and forecast travel demands, produces the best conditions that can reasonably be expected.

The rationale for the TVTC Gateway Constraint Policy is described below:

- **I-680 North.** The section north of Diablo Road cannot be widened beyond the HOV/Express Lanes without overcoming several significant constraints: the widening would require additional right-of-way, construction of new retaining structures, and the costly reconstruction of existing overpasses and undercrossings, as well as increase impacts on adjoining land uses. The gateway constraint assumption recognizes these constraints. This concept should not be construed as an effort to preclude all potential solutions to mitigate increasing congestion on I-680 between Interstate 580 and SR-24. TVTC and SWAT should work cooperatively with TRANSPAC and CCTA to identify and pursue strategies that are mutually beneficial.
- **I-680 South.** The section south of SR-84 has limited room to be widened, and this limited widening would help accommodate and balance increased flows into this section from both I-680 and the new planned SR-84 project. Accordingly, the plan recommends the addition of northbound HOV/Express Lanes. It is important to note that Alameda CTC has undertaken this project and is in project development stage. Gateway constraints would still apply for single-occupant vehicles.

Figure 13: Locations Where Gateway Capacity Constraint Policy Applies



Source: DKS Associates, 2009

- **I-580 West.** The topographic constraints along the Dublin Grade and the limits imposed at the I-680/I-580 interchange make widening beyond the current mixed flow lanes and planned HOV/Express Lanes prohibitively expensive. The 1997 opening of the Dublin – Pleasanton BART line provided a new alternative to vehicular use of I-580. The Plan relies on the HOV/Express Lanes and BART to provide needed additional capacity through the gateway.
- **I-580 East (Altamont Pass).** Alameda County policy, in recognition of the need to encourage shorter commuter trips and not overload Tri-Valley roads with regional traffic, opposes increases to capacity for single-occupant vehicles across this gateway. The gateway constraint policy also applies to Patterson Pass Road, Tesla Road, and Old Altamont Road. The plan, however, includes HOV/Express Lanes as a priority project, in recognition of the importance of I-580 as a regional facility. The Plan also relies on and supports the continuation of the recent ACE service across this gateway.
- **Crow Canyon Road (to Castro Valley).** Safety improvements are planned for this section of Crow Canyon Road, although, the TVTC supports maintaining the two-lane cross-section.
- **Vasco Road.** The Plan includes safety improvements to Vasco Road. Any future upgrade should include future accommodation of public transit or other improvements as subsequently determined appropriate.

Accordingly, the TVTC Plan includes the following Gateway Constraint Policy, which establishes maximum roadway widths for the freeways and major arterials that access the Tri-Valley:

- **I-680 North:** Six lanes plus HOV/Express Lanes and auxiliary lanes
- **I-680 South:** Six lanes plus HOV/Express Lanes and auxiliary lanes
- **I-580 West:** Eight lanes with HOV/Express Lanes
- **I-580 East (Altamont Pass):** Eight lanes plus HOV/Express Lanes
- **Crow Canyon Road (to Castro Valley):** Two lanes with safety improvements
- **Vasco Road:** Two lanes with safety improvements

Any departure from these assumptions would require amending the TVTC Plan.

To address the technical challenges raised by incorporation of the Gateway Constraints Policy into the TVTC Plan, CCTA has established a gateway constraint

analysis methodology as part of its *Technical Procedures*.[2] This methodology takes into account physical roadway constraints, queuing, and recurrent delay at the gateways.

Current gateways are established by two factors: geographic constraints and financial constraints. To some degree, the geographic constraints can be overcome through significant capital investments in new highway projects. However, the TVTC Plan is based upon the assumption that significant capacity enhancements to the gateways serving Tri-Valley are not financially feasible. The policy of the TVTC is to work closely with neighboring jurisdictions, Congestion Management Agencies, Caltrans, and MTC to resolve capacity problems at the gateways and, as needed, through the partnership activities and to subsequently adjust Tri-Valley Transportation Plan should funding of mutually acceptable facilities become possible.

Corridor Management Congestion Strategies. A number of alternative strategies to adding new lanes or building new roads are available for addressing congestion. These strategies focus on improving the efficiency of traffic flow on roads, and thereby increasing the number of vehicles or people that can move through that corridor. The range of potential strategies is broad. They can include the addition of auxiliary lanes to freeways, incident management programs such as the Freeway Service Patrol, changeable message signs that provide information to travelers on travel alternatives, ramp metering, and support for travel alternatives such as park-and-ride lots and HOV bypass lanes at freeway ramps. In a sense, the gateway constraint concept is a strategy for managing the main travel corridors within the Tri-Valley.

Caltrans, with support from MTC, is in the process of implementing Traffic Operations Systems (TOS) along freeway corridors within the Bay Area. These systems will provide information to travelers on accidents and other delays on freeways, alternative routes to avoid these delays, and other information to encourage traveler decisions that would improve efficient roadway operations.

Ramp metering controls the volume of traffic entering a freeway at selected ramps to avoid break-down in the flow on the freeway. By avoiding breakdown, the freeway is able to maintain the highest level of throughput and the system is kept as efficient as possible. Although a single freeway lane can carry as many as 2,000 to 2,200 vehicles per hour under optimal conditions (maximum throughput generally occurs at a level of service E), as demand exceeds those optimal conditions, the volumes carried actually drop. Under the most congested conditions (level of service F), travel lanes have been observed to carry only

around 1,600 to 1,700 vehicles per hour. One source of this congestion is the "turbulence" caused by the merging of vehicles at freeway ramps. By smoothing out this merging, ramp metering can help make the flow of traffic on the freeway lanes more efficient and thus increase the vehicle throughput and speeds.

An additional benefit from ramp metering is a decrease in the accident rate. Reductions from 20 to 50 percent have been achieved through improved merging operations. The reduction of accidents not only improves the safety of the freeway, but also reduces non-recurring delay and increases freeway throughput. Ramp meters can also encourage the peak spreading that needs to occur to keep the gateways flowing. This happens because motorists are generally willing to accept no more than about a 10-minute wait at the meters. Beyond that, they tend to adjust their trip making (i.e., choose to travel at a different time or choose a different mode). This peak spreading helps to get the most out of the system when gateway constraints are a reality. When combined with HOV bypasses, ramp metering can also provide an additional incentive for carpooling and can help buses increase average speeds. When combined with HOV lanes on the freeways, the ramp metering-with-bypass system allows carpools and buses to achieve real travel time advantages compared to single-occupant vehicles.

Ramp metering has two potential drawbacks: backups on the local street system and rewarding long-distance commuters. The potential for backups on local streets can be minimized through ramp widening and strategic placement of the meters. Where these mitigation measures are not possible, ramp metering can significantly reduce levels of service adjoining intersections and along adjacent streets. Backup onto local streets can also be avoided by installing detectors at the end of ramps and adjusting metering rates to avoid backups beyond the end of the ramp. Some of the recent ramp-metering implementations in the Bay Area have proceeded with formal agreements between Caltrans and the local jurisdictions that spill-back detectors and metering rates will be used to prevent the backups onto local streets.

Ramp metering can result in a disproportional benefit to long-distant commutes when there is a high percentage of through travelers and the metering rates in the corridor are set low to maintain the highest possible speeds on the freeway through lanes. The risk of rewarding long-distance commutes can be minimized by implementing the following three policies: 1) deploy the system of ramp metering for the entire length of a freeway corridor rather than in isolated locations, 2) meter to achieve maximum throughput rather than maximum freeway speed, and 3) set upper limits on the delay imposed at individual ramps.

Ramp metering has recently been implemented in the Tri-Valley on the eastbound and westbound ramps of I-580. An evaluation of the benefits and impacts of the ramp metering will continue. The Contra Costa jurisdictions have not reached consensus on the implementation of ramp metering on I-680. Ramp me-

tering should not be implemented on I-680 until a general consensus is reached among affected jurisdictions on a workable and equitable implementation plan for the I-680 corridor. Consideration should be given to how ramp metering would affect the local roadway network as well as the effect it would have on the freeway.

Freeway HOV and Express Lanes. Significant changes to freeway operations are underway in the Tri-Valley. Significant portions of I-580 and I-680 within the Tri-Valley will be part of a 550 miles Bay Area Express Lanes Network. The Bay Area Express Lanes Network is part of Plan Bay Area, the Regional Transportation Plan adopted by MTC's Commissioners in July 2013. It designates a network of existing or planned HOV lanes that will be converted to Express Lanes, in which drivers not eligible for use of the HOV lanes will be allowed to pay a toll to use the lane.

Planning for the Bay Area Express Lanes Network has been coordinated by MTC, but has included the direct planning and design work of the Congestion Management Agencies and Transportation Authorities of the counties in which the lanes will operate. Included in the network is the existing southbound Express Lane on I-680 between SR-84 and SR-237 which opened in September 2010, and the eastbound and westbound I-580 Express Lanes that are under construction by Alameda CTC. Eastbound I-580 Express Lanes will be double express lanes while the westbound direction will include a single express lane. The southbound I-680 express lane is the first Express Lane in the Bay Area was planned and designed by the Alameda CTC, in cooperation with the Santa Clara Valley Transportation Authority, Caltrans and the local jurisdictions along the route. It is operated by Sunol JPA. Since the opening of the Express Lane on I-680, a second Express Lane was opened at the interchange of SR-237 and I-880 in Santa Clara County.

The plans for the Bay Area Express Lanes Network identify three stages of Express Lanes system development: existing lanes, near-term projects (by 2020) and long-term projects. Included in the near-term projects are the conversion of the planned northbound HOV lane on I-680 between SR-237 and SR-84; the conversion of the westbound HOV lane on I-580 between Greenville Road and San Ramon Road/Foothill Road (construction underway); the conversion of the existing eastbound HOV lane on I-580 between Hacienda Drive and Greenville Road; the addition of a second Express Lane eastbound between El Charro Road and Vasco Road (construction underway); and the conversion of existing HOV lanes on I-680 between Alcosta Road and Livorna Road in the northbound direction and Alcosta Road and Rudgear Road in the southbound direction. Other portions on I-680 north of Rudgear Road are also planned for near-term implementation but are outside of the Tri-Valley. The long-term plans for the Bay Area Express Lane Network within the Tri-Valley include the portion of I-680 between the Contra

Costa/Alameda county line and SR-84, and the portion of I-580 between Greenville Road and the Alameda/San Joaquin county line.

HOV and Express Lanes provide the advantage of reducing travel times for ridesharers and transit patrons. They also enhance mobility during off-peak hours by being available for all vehicles. This is especially important when considering truck traffic, which increasingly relies on off-peak hours to reach destinations without undue delays. The TVTC recognizes the benefits of HOV and Express Lanes, but realizes that take-a-lane programs do not work. Thus, HOV and Express Lanes must be added to the freeways.

Arterial Issues. The planned arterial system has been designed to provide smooth circulation in and between the Tri-Valley cities and to provide access to the freeway system. Intersections and freeway interchanges are the focal points of the arterial system. All of the widenings and extensions are necessary to serve new development, so the plan calls for direct developer construction or at least funding. The primary issue is how to share costs between jurisdictions having joint responsibility for a particular road. This is discussed further in the Financing Plan chapter.

There are two major arterials in the Tri-Valley that do not provide direct access to planned development but rather serve interregional traffic between Alameda County and Contra Costa County: Crow Canyon Road and Vasco Road.

Crow Canyon Road. The portion of Crow Canyon Road west of Bollinger Canyon Road is a two-lane rural road that lies within the jurisdiction of Alameda County and Contra Costa County. While once used by its adjacent residents to bring goods to the market, today Crow Canyon Road is being used by commuters as an alternate to the I-580/I-680 freeways. Development in the vicinity of Crow Canyon Road, especially in the fast-growing San Ramon Valley area, has generated a significant increase in traffic on this roadway. The expected forecast for this roadway is LOS F.

The roadway, which is a narrow and winding road, was not designed to handle commuter traffic and does not have adequate width or alignment. Alameda County, in collaboration with Contra Costa County and the City of San Ramon, prepared and developed a project study report, pursuant to California Senate Bill 1149. The report recommended the construction of widened shoulders, climbing lanes, left-turn lanes, safety measures, and road realignment eliminating short-radii curves.

Contra Costa County has in its Measure C program the improvement of Crow Canyon Road within Contra Costa County. Alameda County, how-

ever, is seeking funds to improve the two-lane section of the roadway. Unfortunately, improvement of this portion of Crow Canyon Road cannot be directed to a particular developer construction. But since the traffic forecast clearly indicates that traffic increase on this roadway is development-related, it is recommended that subregional transportation impact fees be used to improve the section of Crow Canyon Road within the Tri-Valley.

Vasco Road. Vasco Road is a narrow and winding rural road that is a major commuter and truck route linking the Tri-Valley with eastern Contra Costa County. Approximately 17 miles of Vasco Road, starting at a point on Vasco Road approximately one-half mile south of the county line to the intersection of Camino Diablo in Contra Costa County, has been relocated as a result of the construction of the Los Vaqueros Reservoir. This portion of Vasco Road is designed to State and County standards. The remaining section of the roadway in Alameda County needs to be upgraded to these standards as well to improve traffic flow and safety. Alameda County is currently seeking funds to improve the section of the roadway from the new Vasco Road to the Livermore City limit. This proposed improvement includes realignment of the roadway, widening of shoulders, installing median barriers, installing guardrails, and installing passing lanes without increasing its capacity, consistent with the standards being used in the Los Vaqueros-Vasco Road project.

There are also numerous rural roads within the Tri-Valley that are not Routes of Regional Significance but are significantly impacted by congestion on the designated Routes of Regional Significance. These rural routes often become reliever routes for the main roads during periods of heavy congestion or lane closures. It is important to monitor growth in traffic on these rural roads to determine whether new management actions are required on the Routes of Regional Significance to reduce the diversion of traffic.

Road Improvements. The TVTC Plan includes many road improvement projects, of which many are planned or under construction. These projects, listed in Tables 9 and 10, were developed by the member jurisdictions of the TVTC. Projects range from intersection modifications to freeway improvements and new roads (Dublin Boulevard Extension).

Table 9: Projects for the Tri-Valley Interregional Routes of Regional Significance

Project / Action Name	*Project / Action Limits*	*Primary Sponsor*
I-580		
Westbound HOV Lane	Foothill Road to E. of Vasco Road	ACTC
Eastbound through lane #5	Santa Rita Road to Vasco Road	ACTC, Caltrans
Westbound Aux Lane	Airport Boulevard to Tassajara Road	ACTC
Eastbound HOV conversion to express lane	Hacienda Drive to Greenville Road (Double lane form El Charro Road to Vasco Road)	ACTC
Westbound HOV/Express lane	Greenville Road to San Ramon Road /Foothill Road Overcrossing	ACTC
Eastbound auxiliary lanes	Isabel Avenue and North Livermore Ave North Livermore and First Street	ACTC
Traffic Operations System		ACTC, Caltrans
Park and Ride Lots		Caltrans
Interchange Improvements – Phase 2	El Charro Road and Fallon Road	Livermore, Dublin, Pleasanton
Corridor right-of way preservation		ACTC, Livermore, Dublin, Pleasanton
Eastbound truck climbing lane		Caltrans
Greenville Road Interchange improvements		Livermore, Caltrans
BART extension to Livermore		Livermore, BART
I-680		
I-680: Construct Auxiliary Lanes, Sycamore to Crow Canyon	Sycamore Valley to Crow Canyon	CCTA, Caltrans
HOV/Express lane over Sunol Grade (northbound)	Northbound HOV/Express lane from SR 237 to Rt. 84	ACTC, Caltrans
Southbound I-680 HOV Lane Extension	North Main to Livorna	CCTA
Transportation Operations System on I-680 South of I-580	I-580 to Santa Clara County Line	ACTC, Caltrans
I-680/SR-84 Interchange improvements	I-680/SR-84 Interchange	ACTC, Caltrans

Project / Action Name	*Project / Action Limits*	*Primary Sponsor*
I-680/I-580 Interchange: Widen I-680 in each direction for HOV/Express lanes	I-680/I-580 Interchange	ACTC, Caltrans
I-680 Widening for and implementation of NB/SB HOV/Express lanes	Between SR-84 and Alcosta Road	ACTC, Caltrans
I-680 Direct Access HOV Ramps	Near Bishop Ranch in San Ramon	CCTA, Caltrans
SR-84		
Isabel Avenue widening to four lanes	Stanley Boulevard to Ruby Hills Drive	Caltrans, ACTC, Livermore
Isabel Avenue widening to six lanes	Airway Boulevard To Stanley Boulevard	Livermore, ACTC, Caltrans
Phase 2 of Isabel Interchange: Widen Isabel Avenue Overcrossing to 6 lanes		Livermore, Caltrans
SR-84/I-680 interchange and SR-84 widening		ACTC, Caltrans, Pleasanton
Niles Canyon Road/Polama Way/Pleasanton-Sunol Road Intersection Improvements		Alameda County
Sunol Circulation Improvements		Alameda County
Vasco Road		
I-580/Vasco Road interchange	I-580 at Vasco Road	Livermore, Caltrans
Vasco Road widening to six lanes	Scenic Avenue to Northfront Road	Livermore
Vasco Road widening to eight lanes	Northfront Road to Las Positas Drive	Livermore
Safety improvements on Vasco Road	Livermore city limit to the Alameda/Contra Costa line	Alameda County
Crow Canyon Road		
Widening to 6 lanes	Alcosta to Dougherty Road	San Ramon
Safety improvements on Crow Canyon Road	Castro Valley Boulevard to Alameda County/San Ramon limit line	Alameda County

Table 10: Projects for the Tri-Valley Intraregional Routes of Regional Significance

Project / Action Name	*Project / Action Limits*	*Primary Sponsor*
Alcosta Boulevard		
None		
Bernal Avenue		
Interchange Improvements		
Second Bridge Construction		
Bollinger Canyon Road		
None		
Camino Tassajara		
Widening	East Blackhawk Drive to county line	Contra Costa County
Danville Boulevard		
None		
Dougherty Road		
Widen to 8 lanes	I-580 to Dublin Boulevard	Dublin
Widen to 6 lanes north of Dublin Boulevard	Contra Costa county line to Dublin Boulevard	Dublin
Dublin Boulevard		
Widen from 5 to 6 lanes	Civic Drive/Sierra Lane to Dublin Court.	Dublin
Widen from 4 to 6 lanes	Brannigan Street to Fallon Road	Dublin
Dublin Boulevard Extension	Tassajara Road to Doolan Road/North Canyons Parkway	Dublin/ Livermore
Fallon Road		
Widen from 2 to 4 lanes	Silvera Ranch Drive to Tassajara Road	Dublin
First Street		
First Street interchange	I-580 at First Street	Livermore, Caltrans
Add Median	Scott Street/Portola Avenue	Livermore
Hopyard Road		

Project / Action Name	Project / Action Limits	Primary Sponsor
None		
Iron Horse Trail		
Segment improvements	Dougherty Road to Dublin/Pleasanton BART	Dublin and EBRPD
Completion of the Trail in Alameda County	Dublin/Pleasanton BART to Greenville Road	Local jurisdictions and EBRPD
Crossing improvements	High traffic volume crossings	Local jurisdictions
Overcrossing	Bollinger Canyon Road	San Ramon
Jack London Boulevard		
Widen to 4 lanes	SR-84 to El Charro Road	Livermore
San Ramon Road		
I-580/Foothill/San Ramon I/C	At Foothill interchange	Pleasanton
San Ramon Valley Boulevard		
Widen to 4 lanes through Danville	Sycamore Valley Road to Fountain Springs Drive	Danville
Santa Rita Road		
Santa Rita Road/Tassajara Road interchange	Santa Rita Road/ Tassajara Road at I-580	Pleasanton
Stanley Boulevard		
Widening	Murrieta Boulevard to west city limit	Livermore
Stoneridge Drive		
Widening improvements	Overcrossing at I-680	Pleasanton
Sunol Boulevard		
None		
Tassajara Road		
Santa Rita Road/Tassajara Road interchange	Santa Rita Road/ Tassajara Road at I-580	Dublin
Widen to 8 lanes	I-580 to Dublin Boulevard	Dublin
Widen to 4 to 6 lanes north of Dublin Boulevard	Dublin Boulevard to County line	Dublin
Tesla Road		

Project / Action Name	Project / Action Limits	Primary Sponsor
Safety improvements	South Livermore Avenue to Greenville Road	Alameda County

5.3 Transit

The key transit improvements in the Tri-Valley, since the previous Plan update, have been the implementation of LAVTA's Rapid route in January of 2011, providing a frequent and efficient alternative to the congested I-580 Corridor, and the construction of a new BART Station at West Dublin/Pleasanton. All Tri-Valley public transit operators have increased their regional connectivity between counties, cities, and modes of transit. LAVTA's Route 70x and County Connection's Bishop Ranch Express are excellent examples of this improved regional access.

The development pattern in the Tri-Valley is one of overall low density, making the extensive use of transit or cost-effective transit operations more challenging. If transit is to serve a much greater role than it does today, development densities would need to increase. Some plans for higher residential or commercial densities around BART Stations are planned or under development. There is also an increasing awareness among local cities of Sustainable Communities and Transit Oriented Development principles, as evidenced by the plans for a dense commercial and residential mixed-use development around the West Dublin BART Station and the future BART extension to Livermore at Isabel Avenue/I-580.

The TVTC Plan recommends the following public transit improvements: enhanced ACE commuter service; additional park-and-ride lots; additional express bus service in heavily traveled corridors; additional local bus service to new development areas; reoriented local bus service to serve BART and park-and-ride lots, and decreased headways on existing routes. Future public transit projects and improvements will be guided with input from representatives of LAVTA, County Connection, ACE, and BART. The planning and coordination for Tri-Valley transit service should also be guided by an Alameda Countywide Transit Plan, now under development by the Alameda CTC, and the Countywide Transportation Plan being developed by CCTA.

BART. The San Francisco Bay Area Rapid Transit District is preparing a project-level Draft Environmental Impact Report (DEIR) for a BART-to-Livermore Extension Project. The proposed project is being developed in partnership with the City of Livermore. It consists of a 4.8-mile BART extension along I-580 to a station in the vicinity of the Isabel Avenue/I-580 Interchange incorporating a bus-to-BART transfer opportunity. It also includes express bus services linking inter-regional rail service at the Vasco Road ACE Station, Priority Development Areas (PDAs) in Livermore, and proposed off-site parking facilities. Limited parking would also be provided at the Isabel Avenue/I-580 BART station.

ACE Commuter Service. The ACE commuter service, which began service through the Tri-Valley in 1998, provides peak-hour commuter train service between the Central Valley and Santa Clara County. The ACEforward plan would include extending new rail service to downtown Modesto and Merced and operational improvements that would enable the system to expand service from four round trips per day to six between Stockton and San Jose.

Park-and-Ride Lots. The Plan recommends the SMART parking program at BART station and park-and-ride lots along I-580. This program is envisioned to have real-time electronic signs along I-580 that would inform motorists of the parking conditions at BART stations and park-and-ride lots, and coordinate the access to parking with LAVTA buses. Addition of new park-and-ride lots is also recommended in the Plan. These would be served primarily by public bus routes and shuttles, and could also serve as staging locations for carpools, bicycle storage and pedestrian access to each of these modes.

County Connection. The Plan calls for an improvement in on-time performance and service changes to reflect an increase in development in San Ramon's Bishop Ranch Business Park. In the long-term, new service plans will be created to accommodate future roadway improvements, including HOV direct access ramps installed at a location to be determined along I-680 near San Ramon's city center.

LAVTA/WHEELS. Under the Plan, LAVTA would continue to expand and enhance public bus service within their service area. Current service priorities and goals include:

1. Increase frequency and reduce headways throughout the Tri-Valley area.

2. Extend service to underserved and newly developed areas.

3. Increase and/or improve regional connectivity with other transit operators and with other modes of transportation.

4. Solidify Rapid service in the Tri-Valley.

San Joaquin Regional Transit District. SJRTD offers subscription express bus service from cities in San Joaquin County to Livermore (Lawrence Livermore National Laboratory) and to the East Dublin/Pleasanton BART Station as well as to several locations in Santa Clara County. Service is offered during peak commute periods and is by reservation only.

5.4 Freight Transportation

Freight transportation provides an important contribution to the economy. As such, it is both necessary and appropriate that the Plan gives strategic priority to the movement of freight. There are focused efforts occurring at all levels of the government. I-580 and I-680 in the Tri-Valley are critical parts of the regional freight network, serving to move goods from the San Joaquin Valley and beyond to the Port of Oakland through I-880. Considering the significance of these routes for the freight movement at the national level, the draft Primary Freight Network (PFN) released recently by the Federal Highway Administration as required by the Federal Transportation Act (MAP 21), includes I-580 and I-680 south of I-580 in Tri-Valley in the draft PFN. At the state level, a California State Freight Mobility Plan is being developed. Concurrently, MTC and Alameda CTC are engaged in a collaborative effort to develop a Regional and Countywide Goods Movement Plan. All these plans are expected to recognize and emphasize the importance of I-580 and I-680 in Tri-Valley for freight movement at all levels. To this end, expenditure priority should be given to those operational improvements necessary to prevent the encroachment of commute traffic from congesting these key freight routes during midday hours (defined as from 9:00 AM to 3:00 PM).

5.5 Transportation Demand Management (TDM)

While the TVTC supports TDM measures, it does not want to base the Plan on unrealistic TDM goals that are not supported by feasible programs. The Plan is based on a goal of an average 10 percent increase in average vehicle ridership (AVR) for all employers, increasing the AVR from 1.1 to 1.2. This increase would be realized through the adoption and enforcement of local trip reduction ordinances.

Recently passed Senate Bill 1339 authorized MTC and the BAAQMD to adopt a commuter benefits policy that will require employers with 50 or more full-time employees to offer their employees at least one of the following benefits:

- The option to pay for their transit, vanpooling or bicycling expenses with pre-tax dollars, as permitted under IRS Code 132 (f)—the Transportation Fringe Benefit.

- A transit or vanpool subsidy of at least $75/month in 2013 and adjusted annually for inflation thereafter.
- Access to a free shuttle or vanpool operated by or for the employer.
- An alternate option proposed by the employer and approved by MTC or BAAQMD.

The Boards of BAAQMD and MTC formerly adopted the Bay Area Commuter Benefits Program in March of 2014. Employers subject to the rule had six months to register and show evidence of the program(s) offered.

5.6 Land Use and Growth Management

Land use assumptions for this Plan Update are based on a set of projects produced by ABAG in 2011, prior to adopting SCS in July 2013, and were subject to extensive review and input by staff from the TVTC local jurisdictions through each planning department. It should be noted, however, that the TVTC Plan uses a 2040 forecast that is not the same as General Plan "buildout," which may be either higher *or* lower than the adopted forecast.

Overview of Contra Costa Jurisdictions' Responsibilities under the GMP

The Contra Costa GMP requires that local jurisdictions work with the RTPCs to apply the CCTA's travel demand model and technical procedures to analyze the impacts of proposed general plan amendments (GPAs) and developments exceeding specified thresholds for their effects on the local and regional transportation system. The requirements that apply to Contra Costa jurisdictions are set forth in Section 4 of the Implementation Guide.[3] The requirements involve a 16-step process for consultation between the local jurisdiction initiating the GPA and all other affected parties, including the RTPC. The intent of the GPA review policy is to ensure that the proposed GPA will not adversely affect implementation of the adopted Action Plans.

Overall Process for General Plan Amendment Review

While the GPA review process is a requirement for the Contra Costa jurisdictions, it is essentially voluntary for the Alameda jurisdictions. If the specific GPA or project exceeds the trip threshold specified in the TVTC Plan- 500 net new peak hour vehicle trips, the jurisdiction considering the plan amendment must submit the amendment to the Regional Committee for evaluation of its impact on the ability to achieve TPTP objectives. The Growth Management Program directs

[3] Contra Costa Transportation Authority, Growth Management Program Implementation Documents, *Implementation Guide*, Adopted June 16, 2010, p. 41.

the RTPCs to 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:

1. Demonstrate that the amendment will not violate Action Plan policies or the ability to meet Action Plan MTSOs; or

2. 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 Measure J Growth Management Program.

General Plan Consistency with Contra Costa Action Plans

The Action Plans for Routes of Regional Significance will be based on adopted General Plan land uses, the existing road network, and planned improvements to the network. Consistency with the Action Plans must be established for any changes to the General Plan that may significantly reduce the ability of the facility to meet the MTSOs. The RTPC will be responsible for establishing the type and size of amendment that will require review by the RTPC and the process for implementing this review. Approval of a GPA found to be inconsistent with the adopted Action Plans may render the jurisdiction ineligible for funding through the Local Streets Maintenance and Improvement and Transportation for Livable Communities (TLC) program in Measure J.

Consistency with the Action Plans can be achieved by revising the proposed amendment, adopting local actions to offset impacts to the Route of Regional Significance, or Council or Board denial of the amendment.

Jurisdictions in the Tri-Valley may implement a proactive Growth and Congestion Management Strategy once a detailed growth management study has been conducted. The study should indicate the development reductions, land use density reductions, or other types of growth management or control that would be required for each applicable Tri-Valley jurisdiction to achieve MTSOs. Any development reduction should be proportional to the traffic distribution percentages for each jurisdiction. Also, the impact of this development reduction to traffic impact fees should be analyzed. All jurisdictions will then review this information and know exactly how much reduction in development or growth management or control is needed to meet the MTSOs.

Growth Management Responsibilities in Alameda County[4]

In Alameda County, while the primary responsibility for land use development decisions rest with the local jurisdictions, Alameda CTC reviews the impact of local land use developments on the countywide regional transportation system, as required under the Congestion Management Program, and also ensures consistency with the countywide policies and planning initiatives.

Alameda CTC's review of plans and development projects through its Land Use Analysis Program is designed to occur alongside the CEQA review process to avoid duplication of effort. Alameda CTC strives to perform its review on the same timeline to offer early and proactive input that can aid in refining project design. Alameda CTC limits the scope of its review of land use actions to those with the potential to cause countywide or regional scale impacts. Projects are reviewed if they will cause a net increase of 100 PM peak hour trips. This threshold is applied differently, depending on whether a project requires a GPA or is consistent with an existing general plan.

Alameda CTC has not adopted thresholds of significance for CMP land use analysis purposes. Project sponsors are instructed to use professional judgment to 1) define a threshold that is appropriate for the project context; and 2) use this threshold to determine if roadway segments are impacted.

Local governments in Alameda County have lead agency responsibility for preparing EIRs for development projects or general plan amendments including the transportation impact analysis. In addition, the decision of whether to implement a mitigation measure or to adopt a statement of overriding considerations is a local decision. Alameda CTC's role is to provide comments through the EIR process on the adequacy of analysis. Alameda CTC has authority to require disclosure of impacts and mitigation measures, and to require local agencies to establish a program for securing funding to mitigate transportation impacts of land use decisions. Alameda CTC does not have authority to require implementation of a mitigation measure.

Jobs-Housing Balance

One of the most important strategies for linking land use and transportation is jobs-housing balance. In theory, the more workers can either find affordable, attractive housing close to their jobs, or a job that matches their skills and income needs near their place of residence, the more they can shorten the length and duration of their journey to work. Studies have, in fact, shown that a greater jobs-

---

[4]Alameda County Transportation Commission, *2013 Congestion Management Program Update,* Chapter 6 – Land Use Analysis Program, Oakland, CA, October 2013.

housing balance can shorten work trips, reduce the overall number of work trips, and encourage more walking trips.

In addition, since commute patterns in "imbalanced" areas are now highly directional, adding new jobs could encourage commuting in the direction where capacity remains. This shift would spread traffic demand more and make more efficient use of our investment in the system.

Jobs-housing balance in one area, however, doesn't mean that no one will leave to work in another. In a multi-centered, intensively developed and continually changing urban region like the Bay Area, people usually need to travel beyond their immediate neighborhood not only for work, but also for shopping, childcare, recreation, and other needs. And the large number of dual-career households requires difficult balancing between the different commute needs of the two earners. In addition, even if one area achieves jobs-housing balance, imbalances in other areas will draw workers from balanced areas to where there is a deficit of workers to fill the jobs.

For example, even though the Tri-Valley has a pretty good balance between jobs and employed residents, almost half of those employed residents commute to jobs outside that sub-area. As long as the Silicon Valley continues adding new jobs but few new houses, those businesses will need to bring in workers from adjoining areas like the Tri-Valley and even further afield. Employers in the Tri-Valley will likewise need to find their workers in places like Central and East Contra Costa and the Central Valley.

Urban location theory suggests that greater jobs-housing balance should occur as part of market interactions. While this balancing appears to have taken place at least to some extent in some areas, it has not occurred in the Bay Area. If local and regional policies can make a greater proximity between jobs and housing attractive and affordable to the workers in those jobs, the jobs-housing balance can help support greater efficiency on the transportation system.

5.7 Additional Action Plan Actions

The Tri-Valley Transportation Plan includes programmed projects to address future transportation needs throughout the Tri-Valley and specific projects along each Route of Regional Significance. These projects were identified in previous sections of this chapter. The roadway projects specific to the Routes of Regional Significance were identified in Tables 9 and 10. The analysis of the future travel demand with the programmed improvements indicates that the Tri-Valley will not be able to meet all of the goals of the Plan as reflected in the MTSOs. Additional programs to reduce the amount of vehicular travel or projects to provide additional roadway capacity will be required. To address these potential deficiencies, additional actions have been identified. These include regional actions

designed to improve travel conditions throughout the Tri-Valley as well as additional actions for Routes of Regional Significance.

Regional Actions

Listed below are regional actions that are intended to reduce congestion and improve efficiency on the regional transportation system. These actions are broader in nature than the route-specific actions identified in the following subsection. Implementation of regional actions requires a coordination effort among local jurisdictions and regional agencies. The TVTC jurisdictions, while not able to implement all of these actions directly, agree to use every opportunity to work cooperatively with responsible agencies, including Caltrans, BART and MTC, toward their successful implementation.

1. Increase AVR for peak hour trips from 1.1 to 1.2 through increased number or frequency of express buses, new HOV lanes, other transit improvements and local TDM programs.

2. Improve the operational efficiency of freeways and arterial streets through effective corridor management strategies. These strategies could include traffic operations systems and ramp metering, provided studies show that metering would effectively reduce overall delay within the corridor and not adversely affect operations of adjacent intersections. Provide HOV bypass lanes wherever space permits.

3. Support growth that achieves an overall jobs-housing balance within the Tri-Valley.

4. Support new funding sources to support commute alternatives and alternative-fueled vehicles for transit operators to fund needed transportation projects. The extension of county sales tax measures is one potential source of such funding. The State legislature has also passed enabling legislation that would allow MTC to propose a regional gasoline tax in the Bay Area that would focus on providing increased funding for commute alternatives and other transportation projects.

5. Support active promotion of regional ridesharing services and commute incentives.

6. Support development of a seamless HOV/Express Lane network in the Tri-Valley to encourage the use of carpools and bus transit, and explore the possibility of connecting the HOV/Express Lane network to adjoining areas.

7. Implementation of ramp metering must balance the congestion along freeways and congestion along local jurisdiction streets due to ramp metering operations.

8. Encourage increases in public transit service to meet the needs of the Tri-Valley, particularly the needs of the transit-dependent population.

9. Support feasibility studies regarding the use of high-capacity or alternative-fueled public transit options, wherever it might be appropriate.

10. Support transit agencies' efforts to find sources of stable funding to support ongoing transit operations and to support new or enhanced express bus service.

11. Support increased coordination of bus services between transit operators (both inter- and intra-county) with input and collaboration by representatives from LAVTA, CCCTA, ACE, BART, and the Tri-Valley jurisdictions.

12. Support the preparation by Caltrans of an incident management plan for the State highways in the Tri-Valley. The TVTC recognizes that incidents can have a profound effect on traffic conditions both on the freeways and on the arterials.

13. Proactively support efforts by local public transit agencies and regional policymakers to create a vision for viable, sustainable public transit service for the Tri-Valley. This effort will include formulating a vision for the San Ramon Valley portion of the Tri-Valley.

14. Develop subarea corridor management plans for selected regional routes to ensure adequate roadway capacity for local and subregional travel.

15. Support coordination with Tri-Valley jurisdictions in accommodating their Intelligent Transportation System (ITS) communications needs during the development and implementation of a Regional ITS Communications Plan and/or regional communications infrastructure. Operation and maintenance of the regional communication infrastructure to be provided by the most appropriate and cost-effective level of government.

16. Close gaps and enhance access along regional trails that provide direct access to regional public transit services, transit centers and transfer points.

17. Encourage the coordination of public transit operator's short-range and long-range transit plans with county-level and regional-level planning

documents. Incorporate relevant components of the SRTP's of LAVTA, CCCTA, ACE, BART, and TRAFFIX into TVTC documents.

18. Encourage the development of long-range transit infrastructure needs assessment to enhance public transit service along arterials.

19. Encourage implementation of Complete Streets policies of the local jurisdictions.

20. Encourage regional and local multimodal access to PDAs.

Specific recommendations for expansion of transit services include the following:

1. Explore Feasibility of a Regional Express Bus Program.

2. Extend BART to Livermore.

3. Support Increased Connectivity and Accessibility among Transit Modes.

4. Solidify Expansion and Enhancement of Bus Rapid Transit Project.

5. Evaluate Systemwide Bus Stop Improvements.

6. Support Expansion of Paratransit Services.

7. Support Transit Service in Vasco Road Corridor.

8. Support and participate in a joint TVTC/TRANSPAC I-680 corridor high-capacity transit study to relieve congestion on I-680.

Additional Actions for Routes of Regional Significance

This section describes additional actions for specific Routes of Regional Significance within the Tri-Valley designed to address potential deficiencies in MTSO values for 2040. These actions would involve development of projects that are currently not fully funded and are therefore above and beyond the actions identified in Tables 9 and 10 that are already programmed. These projects are in a conceptual design phase and must still go through an environmental review and public comment period before being programmed.

Once the Plan is adopted, each jurisdiction will be responsible for making a good faith effort to implement the agreed-upon actions. In Contra Costa County, a jurisdiction's compliance with the 2004 Measure J Growth Management Program will be judged based partly upon its efforts to implement these agreed-upon actions.

The actions, programs and measures identified in the Action Plan are intended to mitigate congestion and achieve the MTSOs assuming that future traffic will be constrained by the limited capacities of highway facilities serving the Tri-Valley Gateways (see Section 5.2, "Gateway Constraints Policy"). An individual jurisdiction may also elect to implement more stringent actions, measures or programs, in addition to those identified in this plan, on facilities within its jurisdictions.

Interregional Routes

I-580

- I-580: Construct HOV Lanes, Greenville Road to San Joaquin County line.

I-680

- Construct a direct access HOV Ramp on I-680 at Norris Canyon Road or Executive Parkway (location to be determined).
- Construct a northbound I-680 HOV Lane connection from Rudgear Road, through the SR 24 junction to the existing HOV lane at North Main Street. This element involves the construction of a new HOV flyover structure over the SR 24 interchange.
- Evaluate ramp-metering on I-680 in Contra Costa County as a method for maintaining an acceptable level for the delay index on both the freeway as well as the local roadway network.
- Expand I-680 Express Bus System.

- Improve geometrics of intersection of Crow Canyon Road/I-680 south-bound off-ramp adding another lane on the approach to Crow Canyon Road.

SR-84

- SR-84 Expressway.

Vasco Road

- I-580/Vasco Road Interchange - Improve to ultimate configuration which will be a partial cloverleaf with loop ramps for traffic entering westbound I-580 from northbound Vasco Road and eastbound I-580 from southbound Vasco Road.

Intra-Regional Routes

- None

6 FINANCIAL PLAN

6.1 Overview of the Financial Plan

The projects and programs of the TVTC Plan receive funding from a variety of sources. Many of the projects and programs designed to address needs within an individual community are funded by the general revenues of the jurisdiction (city or county) in which the project is being implemented or through development impact fees specific to the jurisdiction. Larger projects of a more regional nature generally receive funding from a variety of funding sources designed to address subarea or regional issues. These include revenue from the county sales tax measures for Alameda County (Measure B) and Contra Costa County (Measures C and J).

Measure B was passed in 2000 and extended the half-cent sales tax for transportation in Alameda County through the year 2022. Measure B provides roughly $3 billion over the 20-year period. Some of the key Tri-Valley projects funded by Measure B are the following:

- I-580 Auxiliary Lanes
- I-580 BART to Livermore Studies
- I-680 Express Lanes
- SR-84 Expressway
- Vasco Road Safety Improvements
- Altamont Commuter Express Rail Capital Improvements
- Bicycle and Pedestrian Trail Improvements

A measure to add an additional half-cent and extend the existing sales tax for a 30-year period (Measure BB) was passed by voters in Alameda County in November of 2014. Measure BB projects in the Tri-Valley include the following:

- BART expansion, modernization and extension to Livermore in the I-580 median to Isabel Ave.
- Operating funds for LAVTA Wheels bus service
- Affordable and accessible transit for seniors and people with disabilities
- Affordable student transit pass program and safe routes to schools
- Freight corridor improvements on I-580
- I-580 interchange improvements at Greenville Rd., Isabel Ave. and Vasco Rd.
- I-580/I-680 interchange improvements

- I-680 carpool/express lanes from Alcosta Blvd. to State Route (SR) -237
- Major commute Corridor improvements to Dougherty Rd., Dublin Blvd., El Charro Rd. and Greenville Rd.
- SR-84/I-680 interchange improvements and SR-84 widening
- Improvements to support transit oriented development at East Dublin/Pleasanton and West Dublin BART stations
- Iron Horse Trail bicycle and pedestrian projects

Measure C in Contra Costa County was passed in 1988 and provides a half-cent sales tax for transportation through the year 2009. Measure J was passed in 2004 and extends the half-cent sales tax through 2034. Measure C provided roughly $70 million to $80 million per year for total revenues of approximately $1 billion. Measure J will provide roughly $1.52 billion over the 25-year period. Some of the key Tri-Valley projects that will be funded by Measures C and J are the following:

- I-680 HOV Lane Gap Closure and Transit Corridor Improvements
- BART Parking, Access and Other Improvements
- Local Street Maintenance and Improvements
- Major Street Traffic Flow, Safety and Capacity Improvements
- Transportation for Livable Communities Grants
- Pedestrian, Bicycle and Trail Facilities
- Bus Services
- Transportation for Seniors and People with Disabilities
- Commute Alternatives
- Congestion Management, Transportation Planning Facilities and Services
- Safe Transportation for Children

Additional regional funds are provided by the following federal, state and regional sources:

- Federal Surface Transportation Funds – MAP-21
- State Transportation Development Act (TDA)/State Transit Assistance (STA) Revenues
- State Transportation Improvement Program (STIP) Funds
- State Corridor Management Improvement Account (Prop 1B)
- State Environmental Enhancement and Mitigation
- STDA, Article 3 – Bicycle and Pedestrian Funds

- Bridge Toll Revenues
- Regional Measure 2 Bridge Toll Revenues for Specific Projects and Programs
- AB 1107 half-cent sales tax revenues for transit (BART and AC Transit)
- Transportation Fund for Clean Air - Vehicle Registration Fees for Clean Air Programs

Because of the dramatic growth that is expected in the Tri-Valley and the surrounding areas, the funding from the sources identified above will not be sufficient to address all of the travel needs in a way that allows the area to meet all of its MTSOs in 2040. Since the first plan was adopted in 1995, the TVTC has looked to additional Tri-Valley funding from new development for improvements that can be linked directly to new development. Two elements of the financing plan for the TVTC Plan are designed to address this additional need for funds: the subregional transportation impact fee, and the cost-sharing formulae for road improvements that benefit multiple jurisdictions.

6.2 Sub-Regional Transportation Impact Fee

In 1998, the member jurisdictions of the Tri-Valley Transportation Council entered into a Joint Exercise of Powers Agreement (JEPA) that established the Tri-Valley Transportation Development Fee, or TVTDF. The TVTDF comprises a set of uniform fees on new development within the Tri-Valley area. The use of the fee is guided by the TVTDF Strategic Expenditure Plan, which outlines the priorities for the Tri-Valley area as agreed to by the seven TVTC member agencies. The TVTDF Strategic Expenditure Plan (SEP) lists project costs for each of the potential projects to be funded; estimates expected revenues from the TVTDF and other possible revenue sources for the projects; sets a prioritization plan and a timeline for project delivery; and identifies the TVTDF jurisdiction responsible for overseeing implementation of the project.

The projects that the fee can fund are divided into two groups. Exhibit A projects are the original projects funded through the fee program adopted in 1995. Exhibit B projects have been added in the latest update of the fee nexus study because they are considered important regional projects to help address the impacts of growth with the Tri-Valley. For current information on the status of the TVTDF program, please refer to the most recent SEP adopted in March 2011.

6.3 Shared Facilities

Implementation of much of the planned arterial system will be the direct responsibility of new development. Many of the arterials, however, are shared among

jurisdictions. For each of these improvements, a negotiated agreement needs to be reached about cost sharing between jurisdictions. The cost-sharing approach could be based on which jurisdiction's traffic is expected to use the facility, or it could be based simply 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 road improvements is clear.

7 PLAN IMPLEMENTATION, MONITORING, AND REVIEW

This chapter describes how the Tri-Valley Transportation Plan will be implemented. Specific topics include plan adoption by member jurisdictions, the procedure for monitoring transportation service objectives, and procedures for handling development applications.

7.1 Plan Adoption and Amendment

As specified in the Joint Exercise of Powers Agreement, adoption of the Tri-Valley Transportation Plan shall require a five-vote majority of all members of the TVTC. Following plan adoption, all TVTC member jurisdictions agree to consider the Plan when adopting or amending circulation elements of their general plans and specific plans, zoning ordinances, or capital improvement programs.

While compliance with the TVTC Plan is essentially voluntary among the Alameda County jurisdictions, at least until aspects of the TVTC Plan become part of the Alameda County Congestion Management Program, the Contra Costa jurisdictions have a mandate for compliance. Because the TVTC Plan constitutes the Action Plan for the Contra Costa Tri-Valley jurisdictions, the Contra Costa jurisdictions in the Tri-Valley must implement the planned actions to maintain compliance with Measures C and J or risk losing their return-to-source funds. Compliance is tied to local implementation of action policies as described in Chapter 5, "Action Plan." One locality, however, cannot be judged ineligible for local street maintenance and improvement funds because of the unwillingness of another locality to participate in the process.

The first TVTC Plan was adopted in January 1995. The TVTC updated it in 2000 in conjunction with the preparation of the 2000 Contra Costa CTP and again in 2009 in conjunction with the 2009 CTP. The 2014 TVTC Plan is the third update to the original plan. In the future, the TVTC is expected to comprehensively update the TVTC Plan every four to eight years.

More focused amendments to the TVTC can be triggered by:

1. Responses to identified exceedances of adopted MTSOs;

2. A jurisdiction's proposal to adopt a major general plan amendment that was not considered in the existing plan and that propose new or modified actions in the TVTC Plan; and/or

3. A change in the major assumptions underlying the Plan, such as a change in the assumptions for Gateway Constraints.

This plan is based upon the assumption that major gateways into Tri-Valley will not be expanded beyond the capacities assumed for the gateways as set forth in Chapter 5 unless mitigated. Any change in these assumptions, such as the addition of HOV lanes on I-580 over the Altamont Pass, would require that this plan be amended to incorporate revised assumptions for the Tri-Valley gateway constraints. Increased capacity at the gateways could significantly increase projected congestion on downstream freeway sections and arterial streets.

7.2 Monitoring Multimodal Transportation Service Objectives

The Multimodal Transportation Service Objectives (MTSOs) are the heart of the TVTC Plan. They represent the both the TVTC's objectives for how the Regional Routes function and its yardstick for measuring progress for achieving its goals. Chapter 5, Action Plan, outlines the MTSOs and the Regional Routes to which they apply.

Currently, the MTSOs are largely being met. With forecast growth, however, many of the MTSOs are expected to be exceeded by 2040, even with planned improvements and the other actions outlined in the TVTC Plan.

As part of the periodic comprehensive review and update of the TVTC Plan, the TVTC will monitor the current status of the MTSOs and forecast their status in the future. This monitoring will rely on data collected from the CCTA and the Alameda CTC.

Duration of Congestion. This MTSO is expressed in terms of hours of congestion per day. Hours of congestion can be measured with traffic counts or speed runs and should apply to mixed-flow lanes only. The plan uses a capacity of 2,200 vehicles per lane per hour (1,100 vehicles capacity for auxiliary lanes). Traffic counts can also be used to show duration of congestion. Freeway monitoring should be done by Caltrans or the CMA.

Delay Index. The Delay Index compares the time required to travel between two points during the peak hour to the time required during non-congested, off-peak hours. This measure is defined as the observed travel time divided by the free-flow travel time:

Delay Index (DI) = (Observed Travel Time) ÷ (Free-Flow Travel Time)

The minimum value for the Delay Index — which indicates minimum delay — is 1.0. A DI of 1.0 indicates that traffic is moving at free-flow speed, as measured by floating car runs, unconstrained by congestion. As congestion increases and average speed decreases, the DI increases as well. For example, a DI of 2.0 indicates that the trip takes twice as long during peak hours as during the off-peak, due to congestion and slow speed.

Intersection Levels of Service. Intersection levels of service should be calculated using the Highway Capacity Manual operational method for AM and PM peak hours based on turning-movement counts. Intersection monitoring should be

conducted by the jurisdiction in which the intersection lies. The intent of the TVTC Plan is to maintain the intersection MTSO at all signalized intersections. However, to avoid extensive data collection, each jurisdiction should establish a list of critical intersections for monitoring.

Overall goals may also be measured by the regional agencies (MTC and ABAG), or through the U.S. Census. These include the following:

Mode Share. Mode share is virtually impossible to measure in the field, except through extensive home interview and work place surveys. These data are available every decade from the U.S. Census and periodically from MTC. In between times, transit ridership should be monitored as a surrogate for mode share. The mode share goal of the TVTC Plan can only be met if transit ridership increases over the reporting period. The transit operators routinely collect and report annual ridership.

Average Vehicle Ridership. This goal relates directly to commute trips. The Tri-Valley Transportation Plan includes a regional action to increase AVR from 1.1 to 1.2. Several Tri-Valley jurisdictions maintain voluntary employer trip reduction programs to increase AVR.

7.3 Development Applications Review and General Plan Amendments

As noted above, the JEPA requires each member jurisdiction to consider the TVTC Plan when it adopts or amends circulation elements of their general plans and specific plans, zoning ordinances, or capital improvement programs. In addition, the JEPA requires member jurisdictions to bring proposed new transportation projects of "regional or subregional significance" to the TVTC for review and comment.

The member jurisdictions, as part of the adoption of the Tri-Valley Transportation Plan, have agreed to analyze the impacts of new development and general plan amendments and to share the results of these analyses with other Tri-Valley jurisdictions. These analyses shall assume gateway constraints described in this plan as described in the Contra Costa Transportation Authority's *Technical Procedures.*

The TVTC Plan recognizes that the Alameda and Contra Costa members of the TVTC must respond to different countywide requirements for analyzing the effects of land use or land use plan changes: the Alameda jurisdictions must fulfill the requirements of the Alameda Congestion Management Program while the Contra Costa jurisdictions must fulfill the requirements of both the Measure C Growth Management Program (which was superseded by the Measure J GMP in 2009) and the Contra Costa CMP.

Development Review. Member jurisdictions must analyze the impacts of any development project that generates more than 100 peak hour vehicle trips and must circulate that analysis to all the TVTC jurisdictions. This analysis may be circulated separately or as part of CEQA documents prepared by the lead agency. Lead agencies may elect to use the MTSOs as thresholds of significance in their CEQA documents. Consistent with the JEPA, the member jurisdiction should forward any regional and subregional transportation projects proposed as mitigation measures for the project for TVTC review and comment.

Contra Costa jurisdictions must conduct this analysis consistent with the Contra Costa Transportation Authority's *Implementation Guide* and *Technical Procedures.* Alameda jurisdictions must assess the effects of the development on the Metropolitan Transportation System consistent with the Alameda CMP.

General Plan Amendments. Member jurisdictions must analyze the impacts of any amendment to their General Plans that generates more than 500 net new peak hour vehicle trips and must circulate that analysis to all the jurisdictions that make up the TVTC. This analysis may be circulated separately or as part of CEQA documents prepared by the lead agency. A jurisdiction considering a general plan amendment should evaluate its impact on the TVTC Plan and demonstrate that the proposed amendment would not significantly reduce the ability to achieve the MTSOs. If further transportation improvements are necessary beyond what are in the TVTC Plan, the jurisdiction should specify how they would be funded.

For the Contra Costa jurisdictions, approval of a general plan amendment found to be inconsistent with the adopted Action Plans may result in a finding that the jurisdiction is out of compliance with the Measure C or J GMP and thus ineligible for Local Street Maintenance and Improvements and CC-TLC funds from the CCTA.

Consistency with the Action Plans can be achieved by revising the proposed amendment, adopting local actions to offset impacts to the Route of Regional Significance, or Council or Board denial of the amendment.

If there are MTSO exceedances, or projected MTSO exceedances, in a Tri-Valley jurisdiction, then that jurisdiction can either (a) implement transportation improvements (e.g., road widening) to correct the MTSO deficiency on that affected network segment, or (b) implement other measures intended to result in measurable improvements to MTSOs on the Routes of Regional Significance network and contribute to significant improvements in air quality. Failing this, the jurisdiction can refer the problem to the TVTC for joint resolution.

The tools and procedures for conducting and analyzing General Plan amendments shall be in accordance with the Measure C/J *Technical Procedures* and *Implementation Documents*. If the specific project or policy changes generate more

than 500 net new peak hour vehicle trips, the jurisdiction considering the Plan amendment should submit the amendment to the Regional Committee for evaluation of its impact on the ability to achieve Action Plan objectives. TVTC 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:

1. Demonstrate that the amendment will not violate Action Plan policies or the ability to meet Action Plan Multimodal Transportation Service Objectives; or

2. Propose modification to the Action Plan that will prevent the General Plan amendment from adversely affecting the regional transportation network.

If neither of these can be done, approval of the General Plan amendment by a Contra Costa jurisdiction may lead to a finding of non-compliance with the Growth Management Program.

In Contra Costa County, if an MTSO is not met following implementation of the Action Plan, the Plan would need to be reevaluated through the forum of TVTC and SWAT. Amendments to the Plan could include a relaxation of MTSOs, a strengthening of actions, or a combination of these approaches. In Alameda County, the jurisdiction with the MTSO violation can elect to modify growth rates, improve the facility, or seek a lower MTSO standard through the amendment process set forth in this chapter.

7.4 Process for Addressing MTSO Exceedances

As noted above, from time to time, the MTSOs are monitored to determine whether they are being achieved. In addition, the MTSOs are evaluated to determine if they can be achieved in the future. For this update, the MTSOs were monitored in 2013, and the traffic forecasts were prepared and evaluated for 2040. In both cases, exceedances of the adopted MTSOs were observed.

Under adopted CCTA policy, exceedance of an MTSO does not constitute a compliance issue with the Growth Management Program. Similarly, the Alameda jurisdictions are not subject to any penalties or loss of funding due to an observed or forecast MTSO exceedance.

The primary purpose of the MTSOs is to provide TVTC with a quantitative measure of transportation system performance that can be consistently applied as a metric for gauging the impacts of future growth and mitigating those impacts. The MTSOs that TVTC has adopted for this Plan are by no means the "lowest common denominator." To the contrary, they reflect a broader objective

of TVTC to ensure an acceptable level of mobility for its residents and workers to sustain the economy and maintain quality of life.

It is not surprising, therefore, given the level of expected growth in the Tri-Valley, coupled with the constraints on adding new capacity to the system, that the MTSOs would be exceeded either today or in the future.

When an exceedance has been determined, either through monitoring or during the Action Plan update process, the only action required under this Plan is that TVTC document the condition, and continue to monitor and address the MTSOs in future updates to the Plan under the timeframe established in Section 7.1 above.

In the case where a proposed development project or general plan amendment causes an exceedance, or exacerbates a situation where an already exceeded MTSO is still further exceeded, then the procedures in Section 7.3 regarding development applications review and general plan amendments shall apply.

7.5 Conflict Resolution

Because of the importance of support for the Plan by all members of the TVTC, the Council should act on a consensus basis. Some cases may arise, however, in which consensus cannot be reached. In cases where conflict exists between jurisdiction within one county, resolution should be negotiated through the forum of the Congestion Management Agency for the respective county. In cases where conflict exists between jurisdictions in different counties, resolution should be negotiated through the TVTC with the provisions of the Joint Exercise of Powers Agreement applying. These provisions state the following:

1. Supermajority of five members required for plan adoption and amendment.

2. Supermajority of five members required for adoption of annual work program and budget.

3. Simple majority for grant applications, expenditure of funds, execution of contracts, and adoption of rules of procedure.

4. Simple majority vote of all members present required for action on any other matter.

7.6 Future Role of TVTC

It is anticipated that implementation of the Action Plan will rest primarily with the individual jurisdictions. However, the plan has identified some continuing functions for the TVTC, as follows:

- Updates and amendments to the Tri-Valley Transportation Development Fee (TVTDF).
- Coordinated implementation of actions requiring inter-jurisdictional co-operation, including supporting the funding and development of the projects and programs listed in the TVTDF.

This page intentionally left blank

Appendix A

This page intentionally left blank

This page intentionally left blank