2017 CMP

2017 CONGESTION MANAGEMENT PROGRAM DOCUMENT

PREPARED BY THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY
THE CONGESTION MANAGEMENT AGENCY FOR SANTA CLARA COUNTY

Valley Transportation Authority
Solutions that move you

DECEMBER 2017

2017 Congestion Management Program

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EXECUTIVE SUMMARY

In accordance with California Statute, Government code 65088, Santa Clara County has established a Congestion Management Program (CMP). The intent of the CMP legislation is to develop a comprehensive transportation improvement program among local jurisdictions that will improve multimodal transportation system performance, land use decision-making and air quality.

The main requirements of the CMP statutes can be summarized as follows:

- Requires the designation of a Congestion Management Agency (CMA) in each urbanized county, to develop and update the CMP and monitor its progress over time.
- Sets up a performance review process, by mandating the designation of a network of transportation facilities that will be periodically monitored for congestion, and by requiring the designation of a level of service standard for roadways and performance measures for all modes of travel.
- Promotes the use of alternatives to the single-occupant automobile through trip reduction programs, land use / transportation integration strategies, and transportation demand management (TDM) measures.
- Promotes integration of decisions about land development, transportation investment and air quality by requiring a process to determine the impacts of local development decisions on the countywide transportation network.
- Requires a seven-year investment strategy, referred to as a Capital Improvement Program (CIP), to support the CMP goals. The CIP is updated biennially and links project eligibility for regional/state funding to the CMP.
- Requires a computerized travel model and uniform database for estimating future transportation needs and impacts.
- Encourages infill development in core areas and along major transit corridors.

The Santa Clara Valley Transit Authority (VTA), as the designated Congestion Management Agency, has prepared this 2017 Congestion Management Program in accordance with the requirements of the CMP legislation. The purpose of this document is to summarize the elements, policies and procedures of the VTA CMP.

WHAT'S NEW IN THE 2017 CMP

The 2017 update signifies an evolving role for the CMP in our region's future. It summarizes the current VTA CMP, changes to the CMP over the past two years, as well as key areas that are likely to be addressed in the coming two years. The 2019 update is expected to have more significant changes due to the items noted below. The 2017 update is minor in comparison. The following is a summary of key changes and additions in the CMP 2015:

- **Added VTA's Mission, Vision, and Core Values** – A new chapter was added to the CMP Document that describes VTA as an agency. The CMP Document was developed based on the mission, vision and core values identified in the Strategic Plan.

- **Additional discussion of Senate Bill (SB) 743 implementation and relationship to the CMP auto LOS standard** – In keeping with the original intent of documenting SB 743 in the previous CMP Document, there are updates regarding the Office of Planning and Research (OPR) development of new criteria to evaluate transportation impacts under CEQA. While OPR has not yet submitted final draft guidance to the Secretory of Natural Resources for rule-making as of September 2017, some cities (such as San Francisco, Oakland and Pasadena) have already changed their CEQA metrics and practices, and other cities (such as City of San Jose) are in the process. Based on indications from OPR, VTA expects that mandatory statewide implementation of VMT analysis to replace LOS analysis in CEQA will be phased in over the next few years. VTA will continue to monitor the SB 743 implementation process and provide assistance to Member Agencies in updating local CEQA standards, and consider potential changes to the CMP and Technical Guidelines as appropriate.

- **Updates to the status of key VTA transportation projects** – The CMP System Definition chapter (Chapter 2) includes updated descriptions of transportation projects VTA is leading or participating in, including the BART Silicon Valley extension, VTA Bus Rapid Transit (BRT) projects, the Light Rail Enhancement Project, the Caltrain Modernization Program, and the Silicon Valley Express Lanes Program. It also includes information related to two new efforts that began in late 2015, the Transit Network Redesign and as part of that effort, the implementation of a new frequent transit network.
- **Updated information about regional programs** – Chapter 7 contains updated discussions of regional planning efforts led by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), such as Plan Bay Area and the PDA Investment & Growth Strategy.

- **Updated Capital Improvement Program (CIP) project listing and funding information** – The list of capital projects in the CMP Capital Improvement Program in Chapter 8 has been updated to reflect completed projects, revised cost estimates, and other changes to maintain consistency with the Transportation Improvement Program (TIP). Updated information has been added about various funding sources related to capital projects in Santa Clara County.

Key areas that the CMP will address with Member Agency input over the next two years include:

- **Implementation of SB 743 Legislation** – As noted above, the Governor's Office of Planning and Research (OPR) is currently updating the CEQA Guidelines to remove auto LOS analysis and require vehicle miles traveled (VMT) analysis in the CEQA analysis of transportation impacts and mitigation measures. SB 743 did not directly call for changes to the Transportation Analysis Standards Element and Multimodal Performance Measures Element of the CMP, however it is expected that these elements will be updated for compatibility with the new CEQA Guidelines. VTA will continue to monitor potential legislation affecting CMPs and intends to update the CMP, with input from the VTA Board, Committees, and Working Groups, over the coming years. VTA will also continue to provide information and assistance to Member Agencies in updating local CEQA standards as appropriate.
- **CMP Monitoring and Conformance Program transition to utilize Big Data** - Since 1997, VTA has used aerial photography to collect data on freeway congestion. Beginning with the 2017 Monitoring & Conformance Report, VTA is studying innovative approaches to data collection such as Big Data[1] (see Chapter 8 for more information). VTA envisions that a transition to Big Data could potentially provide more reliable data for a lower cost. In addition, Big Data may open up new avenues for congestion analysis in areas such as duration of congestion, automobile travel times and reliability, congestion spillover to alternate routes, causes of congestion, transit travel times and reliability, modal split, automobile trip generation, and vehicle miles traveled.

[1] Big Data is a phenomenon currently impacting a wide range of industries, defined as "a new generation of technologies and architectures designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery, and/or analysis" (Big Data: Beyond the Hype, White Paper by Datastax Corporation, March 2012). In the field of transportation monitoring and analysis, Big Data methods involve aggregating traffic-related information from GPS-enabled vehicles and mobile devices, traditional road sensors and hundreds of other sources (INRIX website, accessed 9/11/2013).

ELEMENTS OF THE VTA CMP

CMPs must contain five elements: a system definition and traffic Level of Service (LOS) standard element, a multimodal performance measures element, a transportation demand management and trip reduction element, a land use impact analysis element, and a CIP. In addition to these five elements, other actions, such as the development of a countywide transportation model and Multimodal Improvement Plans, are necessary to meet the requirements of the Statute.

In response to the statutory requirements and the Strategic Plan's vision, VTA has chosen to define its CMP in terms of nine elements that logically structure the program. Each of the nine elements corresponds to a chapter of the CMP and is briefly summarized below:

1. System Definition Element — The CMP Transportation System consists of a roadway network, a transit network, and a bicycle network.

The System Definition Element is linked to other elements in the CMP because all projects proposed for the CIP must be on or benefit the CMP Transportation System. Additionally, roadways included in the CMP Roadway Network will be monitored for conformance with the CMP level of service standard.

The designated CMP Roadway Network includes state highways, county expressways and principal arterials. The adopted definition for principal arterials is: roadways that connect with the freeway and/or county expressway system and meet one of the following criteria: (1) state highway; (2) six-lane facility; or (3) non-residential arterial with average daily traffic of 30,000 vehicles per day.

While the CMP Statutes do not expressly require adoption of a transit network, it does require the inclusion of specified transit system performance measures. Therefore, the CMP includes a Transit Network consisting of rail service and selected bus service. Performance measurements have been established for VTA Transit Service and are identified in the Transit Sustainability Policy and its complementary document, the Service Design Guidelines. The guidelines establish ridership thresholds and ensure that transit service operates as efficiently as possible.

One of the goals of VTA's CMP is to provide for safe and convenient bicycling throughout the county for various types of trips, such as work, school, errands, and recreation by focusing improvements on the Cross County Bicycle Corridors (CCBC). The CCBC is a network of 24 routes for bike travel through the county that are identified in the Santa Clara Countywide Bicycle Plan, adopted by the VTA Board of Directors in 2008.

2. Transportation Analysis Standards Element — For the purpose of congestion monitoring and management, the CMP statute requires that CMAs develop a minimum automobile level of service (auto LOS) standard for CMP Network roadways. Auto LOS describes the operations of roadway segments or intersections in terms of vehicle speed, volume and capacity, and traffic delay. Auto LOS evaluates operations for all common motor vehicle types, including automobiles, light and heavy trucks, and motorcycles. In addition, although congestion affects transit vehicles operating in general purpose lanes, transit operations are affected by additional factors and are typically evaluated separately from auto LOS.

The Transportation Analysis Standards Element contains the adopted auto LOS standard for the CMP Roadway Network and describes the methodologies for evaluating auto LOS. The auto LOS standard is important because CMP Roadway Network facilities must operate within the adopted standard or the Member Agency responsible for the facility must prepare a Multimodal Improvement Plan for that facility.

In addition, Member Agencies must monitor auto LOS using adopted methodologies. A comprehensive description of the auto LOS standard is presented in the CMP Technical Standards and Procedures: Traffic Level of Service Analysis Guidelines and is available upon request.

3. Multimodal Performance Measures Element — The purpose of the Multimodal Performance Measures Element is to define specific transportation system performance measures that can help evaluate how well Santa Clara County's transportation system serves the traveling public. Twelve measures are described in the Element. These measures can be used in a variety of analyses. Some may be used in the development of the countywide long-range transportation plan, some may be used in the CMP monitoring process, some may be used in analyses of the impacts of specific development projects, and some may be used for more targeted efforts such as corridor studies, transit or roadway capital projects.

4. Trip Reduction and Transportation Demand Management (TDM) Element — This element defines and describes TDM programs and lists funding sources Member Agencies can access to implement these projects. Some programs that would be recommended as part of the TDM element include parking management and pricing, roadway pricing, commute alternatives, and cash subsidies. The current countywide transportation plan, VTP 2040, and the Community Design and Transportation (CDT) Program encourage the development and continuation of successful trip reduction efforts through incentives and partnerships.

5. Countywide Transportation Model and Database Element — This element contains a description of the countywide transportation model required by the CMP Statute. The Statute requires that the countywide transportation model be consistent with the regional

transportation model developed by MTC with data provided by ABAG. The countywide transportation model is used to help evaluate cumulative transportation impacts of local land use decisions on the CMP System. Because of the model's significance in the overall CMP, it is extremely important that the model accurately reflect existing land use and transportation conditions.

The CMP also requires local models to be consistent with the countywide transportation model. A comprehensive description of these consistency requirements is presented in the CMP Technical Standards: Local Transportation Model Consistency Guidelines.

6. Land Use Impact Analysis Element — This element describes the procedures used to analyze the transportation impacts of local land use decisions on the transportation system, and the programs designed to influence policy development to better support a multimodal transportation system. The Land Use Impact Analysis Program links local land use decisions with broader transportation and air quality impact analysis. The VTA CMP includes the Proactive CMP Process[2], adopted by the VTA Board in May 1997, which provides a framework for VTA comment on development projects and plans and for quarterly reporting to the Board on Member Agency development decisions.

VTA has developed and adopted Transportation Impact Analysis (TIA) Guidelines to ensure that all projects are analyzed uniformly and consistently. Comprehensive descriptions of the TIA Guidelines are included in the CMP Technical Standards. Over the 2012-2014 timeframe, VTA engaged in a comprehensive update of the TIA Guidelines document to emphasize the reduction of automobile trips and take a balanced, multimodal approach to addressing transportation impacts and effects. Updating the TIA Guidelines offers VTA the opportunity to encourage the use of multimodal performance measures and make the CMP better reflect the goals of SB 375, the regional and countywide long range transportation plans, and local General Plans and policies.

Through a multi-year process, the CDT program was developed in partnership with VTA Member Agencies and the community. The CDT is primarily an advocacy and resource program, providing tools and resources to Member Agencies intended to influence changes in policy, administration, and urban design that encourage well-designed, high-amenity development in cores areas, around transit station areas, and along major transportation corridors. In addition, the CDT Program has given out planning and capital grants to Member Agencies that are developing plans and projects in accordance with the CDT guidelines and planning initiatives.

[2] Now generally referred to as the "Development Review Program" in Reports to the VTA Board and Committees.

7. Capital Improvement Program Element — The CIP is a list of capital projects designed to improve the transportation system and air quality in Santa Clara County. The CIP consists of a list of transportation facility improvements that is submitted to MTC for inclusion in the Regional Transportation Improvement Program (RTIP), the State Transportation Improvement Program (STIP) and the Federal Transportation Improvement Program (TIP). The CIP includes projects from the following funding categories: Regional Improvement Program (RIP) and Interregional Improvement Program (IIP), Surface Transportation Program (STP) and Congestion Mitigation/Air Quality Program (CMAQ) (federal), Transportation Alternatives funds (federal), and the Traffic Congestion Relief fund (state). In addition, projects funded by the 1996 Measure B sales tax, the 2000 and 2008 Measure A sales taxes, the 2006 Proposition 1B bond fund, the 2008 Proposition 1A (High Speed Rail) bond fund, Express Lanes revenue, the 2010 Measure B Vehicle Registration Fee and the Transportation Fund for Clean Air are included in the CIP since they affect the county's transportation system.

The Capital Improvement Program is developed in accordance with the statewide and regionally adopted multimodal criteria for project selection. The regional criteria emphasize maintaining and sustaining the existing transportation system, improving its efficiency and effectiveness through congestion relief, safety improvements and consideration of freight movement, expanding the system, and accounting for external impacts on land use and air quality. The CMP Statute requires that the CIP maintain or improve the performance of the multimodal system for the movement of people and goods, mitigate the impacts of land use decisions on the regional transportation system, and conform to air quality mitigation measures included in state and federal air quality plans.

8. Monitoring and Conformance Element — The CMP Statute requires biennial monitoring to determine Member Agency conformance with all elements of the CMP. The Monitoring and Conformance Element describes the monitoring process used in Santa Clara County. VTA monitors freeway LOS and land use decisions on an annual basis, and all other elements of the Monitoring Program, including CMP intersection LOS on a biennial basis.

Once Member Agencies have submitted their monitoring data, VTA will evaluate it to determine changes to and impacts on the CMP System and to ensure that each Member Agency is in conformance with the CMP. If Member Agencies fail to meet CMP standards or implement CMP requirements, they could be found in nonconformance with the CMP and risk forfeiting gas tax subventions from the state. A description of the requirements and methodologies used in the Monitoring and Conformance Program is available in the Monitoring and Conformance Requirements.

9. Multimodal Improvement Plan Element – This element summarizes the process for the preparation and approval of Multimodal Improvement Plans. Beginning with the 2013 CMP,

VTA uses the term “Multimodal Improvement Plan” for “Deficiency Plan” as defined by state legislation, to highlight the range of multimodal solutions available to Member Agencies that have a traffic LOS deficiency.

Multimodal Improvement Plans must be developed for facilities that are not operating within the adopted traffic LOS standard. Multimodal Improvement Plans may be developed by VTA Member Agencies and must be approved by VTA Board of Directors. Multimodal Improvement Plans must include a set of improvements, programs, and actions for the CMP facility that measurably improve multimodal performance and contribute to a significant improvement in air quality. CMP system facilities that are covered under an approved Multimodal Improvement Plan, or a previously approved Deficiency Plan, may operate below the traffic LOS standard as long as the plan is being implemented.

REGIONAL CONFORMANCE

To meet the requirements of CMP legislation, VTA’s CMP was developed to conform to the Regional Transportation Plan, as well as the MTC’s Guidance for 2017 Congestion Management Programs. The CMP also conforms to the transportation-related provisions of the federal and state California Clean Air Acts, and the regional Clean Air Plan.

MEMBER AGENCY RESPONSIBILITIES

The Congestion Management Program is a cooperative effort between VTA and the CMP Member Agencies – the 15 cities in the county, Santa Clara County, and VTA. Table E.1 outlines the element requirements and major responsibilities of VTA and Member Agencies in complying with the CMP.

THE DEVELOPMENT OF THE 2017 CONGESTION MANAGEMENT PROGRAM

As with all previous efforts, this CMP was developed through a collaborative effort among VTA and its Member Agencies, with occasional guidance from state and regional agencies. The policies contained in this document were initially developed by VTA with input from working groups of the Technical Advisory Committee. Since most elements of the CMP are designed to be implemented locally by Member Agencies, local input throughout the policy development process is crucial to the success of the Congestion Management Program.

After receiving Member Agency and public input, the VTA Board of Directors is responsible for making all policy decisions and for approving the final CMP.

DOCUMENT STRUCTURE & ORGANIZATION

The purpose of the document is to give the reader a comprehensive knowledge of the elements and goals of the VTA CMP. The CMP is organized into nine chapters: the CMP system definition and a chapter describing each element of the CMP. Table ES.1 presents a summary of each element. A number of appendices providing additional information are included at the back of this document. Appendix A provides a glossary of key terms, Appendix I includes the full text of the CMP Statute and related Statutes, and the remaining appendices provide additional technical or descriptive information

In addition, VTA has compiled a set of documents entitled CMP Technical Standards and Procedures that contains all the technical requirements and guidelines that Member Agencies must follow to comply with the CMP. The Technical Standards and Procedures contain the following documents: Requirements for Deficiency Plans, Transportation Impact Analysis Guidelines, Local Transportation Model Consistency Guidelines, Traffic Level of Service Analysis Guidelines, and Monitoring and Conformance Requirements.

TABLE ES.1 | CMP ELEMENTS SUMMARY

CMP Element	Requirement	Timing	Responsible Agency
Transportation Analysis Standards Element	1) Monitor and submit report on the level of service on CMP roadway network intersections using CMP software and procedures.	Dec 1	Member Agencies
	2) Monitor performance of CMP rural highways and freeways	Dec 1	VTA
Multimodal Performance Measures Element	Collect available transportation performance measurement data for use in land use analysis, deficiency plans and the CIP.	Ongoing	VTA
Transportation Demand Management and Trip Reduction Element	No current requirements	Member Agencies and VTA	Trip Reduction and Transportation Demand Management Element
Transportation Model and Database Element	1) Certify that the CMP model is consistent with the regional model	Biennially	MTC
	2) Certify that Member Agency models are consistent with the CMP model	As Needed	VTA and Member Agencies
Land Use Impact Analysis Element	1) Prepare a Transportation Impact Analysis (TIA) for projects that generate 100 or more peak hour trips and submit to the CMP according to TIA Guidelines schedule	Ongoing	Member Agencies
	2) Submit relevant conditions of approval to VTA for projects generating TIAs	Ongoing	Member Agencies
	3) Prepare quarterly report on VTA comments and local agency adopted conditions for VTA Board, CMPP and PAC, TAC, CAC, and BAC	Ongoing	VTA
	4) Prepare and submit land use monitoring data to the CMP on all land use projects approved from July 1 to June 30 of the previous year	Oct 1	Member Agencies
Capital Improvement Program Element	Develop a list of projects intended to maintain or improve the level of service on the designated system and to maintain transit performance standards	Biennially	Member Agencies with VTA
Monitoring and Conformance Element	Outline the requirements and procedures established for conducting annual auto LOS and land use monitoring efforts. Support the Transportation Analysis Standards and Land Use Impact Analysis Elements	Dec 1	Member Agencies and VTA
Multimodal Improvement Plan Element	1) Prepare Deficiency Plans for facilities that violate CMP traffic LOS standards or that are project to violate LOS standards using the adopted Deficiency Plan Requirements.	As Needed	All Affected Member Agencies
	2) Submit Deficiency Plan Implementation Status Report as part of annual monitoring.	Dec 1	Member Agencies with Deficiency Plans

CHAPTER 1 | VTA

This chapter, newly added for CMP 2017, describes VTA as an agency as well as its mission, vision, and core values.

BACKGROUND

While operating Santa Clara County's bus and light rail system is an important part of what we do, it's certainly not the only aspect of our work-and that's a good thing. VTA is a unique organization, so our approach to work must be unique as well. We have wide-ranging authority, including transit development and operations, congestion management, funding, highway design and construction, real estate and transit-oriented development, and bicycle and pedestrian planning. We are truly a multimodal transportation solutions agency, which gives us many great opportunities that other agencies don't have. Our structure is unique in that Bay Area, and to better support our local interests and needs, as well as enhance regional partnerships, we will continue to strive for greater regional independence.

VTA is a collection of more than 2,000 dedicated employees working together to provide transportation throughout Silicon Valley. We provide solutions that move people to their jobs, recreational activities, appointments, home, and more, allowing us to meet the varied needs of a diverse population. From highways to bikeways to safer routes to school, the people of VTA work together to make Silicon Valley residents and workers have the ability to get where they need to go.

MISSION

The **Mission** offers the reason for being. It answers the questions: "Why does this organization exist; what do we do?" To offer services that will add value to the community, this question must be answered clearly and memorably.

For VTA, the answer is: to provide "***solutions that move you.***" Our role is to get people moving and keep the moving.

This answer is broad enough to encompass all the work that VTA does—transit service, congestion management, highway construction, and bicycle and pedestrian facilities—but narrow enough to leave no doubt or confusion about who we are.

VISION

The **Vision** is where we see ourselves in the future. This answers the question "What are you aiming to achieve?" To help the community understand what they can expect from the organization, now and down the line, this question also must be answered clearly.

For VTA, the answer is: ***"To innovate the way Silicon Valley moves."*** This means we plan to position ourselves now and in the future as leaders in the effort to help move the residents of Silicon Valley, an area known for innovation where people expect the newest, cutting edge options to be readily available. Rather than wait for others to develop those options, we will do the innovating: we will create, collaborate and lead, offering options that meet the evolving needs of people around the county.

CORE VALUES

Safety — We plan and deliver services in a way that promotes the health and safety of our employees and the public.

Integrity — We conduct our business in an ethical, honest, and transparent manner.

Quality — We ensure that the services we deliver, and projects that we build, are well designed and maintained to preserve the investment that has been made.

Sustainability — We operate our services and design our projects to minimize the negative impacts on our environment, in a way that can be maintained over time. Additionally, we operate as a sustainable organization by reducing our carbon footprint.

Diversity — We value, respect, and serve the unique needs of our community.

Accountability — We are stewards of the natural resources and transportation tax revenues of the County, take responsibility for our actions, and honestly report our successes and challenges to stakeholders and the public.

PARTNERS

Local jurisdictions hold land use authority, our transportation partner agencies help us make the connections between diverse transit systems, and state and federal agencies set regulations and standards that we must meet, while also provide funding.

We also need to work with community stakeholders and customers to understand the best solutions for a given community. And we need to work with our employees to understand and implement the exciting new ideas that will help further establish VTA as an authority in the transportation industry.

CONGESTION MANAGEMENT PROGRAM

Within this document VTA outlines its responsibility as a Congestion Management Agency (CMA) and how it fulfills those responsibilities. Furthermore, the sections above illustrate VTA's vision in a broader context as a mobility solutions provider. As VTA seeks to reduce congestion at a regional scale through a multimodal approach within a Congestion Management Program (CMP) the ideals outlined above and VTA's duty as a CMA coalesce.

The chapters and information that follows focuses on the CMP statute requirements and how VTA is meeting those requirements. However, this is always to be viewed within the context of VTA as a multimodal transportation solutions provider delivering solutions that keep Silicon Valley moving.

CONGESTION MANAGEMENT PROGRAM AND OTHER VTA DOCUMENTS

This document is complimentary to the other documents that VTA produces - including the Annual Monitoring and Conformance Report, the Valley Transportation Plan, and the Countywide Bicycle Plan. Each of the documents aims to showcase the delivery of projects and programs that will benefit our Member Agencies. Together these interconnected planning efforts position VTA and Member Agencies to fulfill the mission and vision and provide more solutions and choices to meet the transportation needs of the residents and businesses of Santa Clara County.

CHAPTER 2 | CMP TRANSPORTATION SYSTEM DEFINITION

This chapter describes the Congestion Management Program (CMP) Transportation System. The CMP System consists of a roadway network, a transit network, and a bicycle network.

BACKGROUND

In 1990, the State of California enacted legislation to create Congestion Management Agencies (CMAs) in urbanized counties, following voter approval of Proposition 111. Each CMA is responsible for establishing a Congestion Management Program (CMP), envisioned as a comprehensive multimodal approach to solve transportation problems and reduce congestion at the regional scale. In contrast to the previous strategy of continually expanding roadway capacity, the CMP was designed to provide increased and more efficient transit services, increased efficiency of the existing roadway system, reduced traffic demand, and an improved land-use decision making process.

Beginning in 1991, with the enactment of the landmark Intermodal Surface Transportation Efficiency Act (ISTEA), federal transportation funding programs have also encouraged a more coordinated, regional, multimodal approach to transportation planning. ISTEA provisions allowed state and metropolitan planning organizations to take a broader view of the transportation system and its performance. Like Proposition 111, ISTEA shifted a major portion of transportation planning and priority setting from the state to regional agencies, CMAs, and local governments. This overarching philosophy has carried forward to subsequent federal transportation funding bills, including the most recent bill, FAST Act (Fixing America's Surface Transportation Act).

With the adoption of Plan Bay Area 2040 in July 2017, thirteen performance targets guide transportation planning in the Bay Area. These include required targets related to climate protection and adequate housing and voluntary targets related to healthy and safe communities, open space and agricultural preservation, equitable access, economic vitality, and transportation system effectiveness.

The state of California also has adopted three legislative mandates to guide the development of transportation analyses, plans and strategies. These bills are summarized below:

- **AB 32 (Nunez) California Global Warming Solutions Act of 2006.** This bill requires the California Air Resources Board to adopt regulations to require the reporting and verification of Statewide greenhouse gas emissions and to monitor and enforce compliance with this program.

- **SB 375 (Steinberg) Transportation Planning: Travel Demand Models; Sustainable Communities Strategy; Environmental Review, 2008.** SB 375 instructs the California Air Resources Board to set regional greenhouse gas emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization for each region must then develop a "Sustainable Communities Strategy" (SCS), as part of its regional transportation plan, integrating transportation, land use and housing policies to plan for achievement of the emissions target for their region. The second such regional housing and transportation plan adopted by MTC and ABAG, Plan Bay Area 2040 includes the Sustainable Communities Strategy for the Bay Area, as well as the 2040 Regional Transportation Plan.

- **SB 743 (Steinberg) Environmental quality: transit oriented infill projects, judicial review streamlining for environmental leadership development projects, and entertainment and sports center in the City of Sacramento, 2013.** Senate Bill (SB) 743, approved by the California legislature in September 2013, includes changes to the California Environmental Quality Act (CEQA) and CMP law related to the analysis of transportation impacts. Most significantly, the bill directs the Governor's Office of Planning and Research (OPR) to develop alternative metrics to the use of vehicular "level of service" (LOS) for evaluating transportation impacts for purposes of CEQA. The timing of implementing these changes is uncertain; while OPR has not yet submitted final draft guidance to the Secretory of Natural Resources for rule-making as of September 2017, some cities (such as San Francisco, Oakland and Pasadena) have already changed their CEQA metrics and practices, and other cities (such as City of San Jose) are in the process. While the change in CEQA practice does not necessarily affect CMP analysis which is based on separate state legislation, the changes resulting from SB 743 may also encourage VTA to update the CMP and related Technical Guidelines for consistency.

CONGESTION MANAGEMENT PROGRAMS

Propositions 111 and 108 together increased funding for California's transportation system by billions of dollars. With this new funding came the requirement that urbanized counties create or designate a CMA that is responsible for preparing and implementing a Congestion Management Program (CMP) every two years. An additional gas tax was created to fund transportation improvements and CMA activities. The majority of the funds are transferred from the CMA to Cities and the County through gas tax subventions, however Member Agencies must be found in conformance with the CMP to receive these subventions.

Although the primary focus of the congestion management program was originally envisioned as reducing congestion and thus improving mobility for persons and freight, the requirements of the CMP recognize the inextricable links between transportation, land use, and air quality. Over time, CMPs in the Bay Area have evolved to emphasize an overall reduction in single-

occupant vehicle trips and increase in pedestrian, bicycle and transit mode share in addition to managing congestion. Moreover, the statute acknowledges that these policy issues are not only functionally interrelated, but jurisdictionally interrelated as well. Accordingly, the statute requires cities and counties to work together to find cooperative solutions to these multi-jurisdictional problems. By operating as a "bridge" between local agencies and the regional and state levels of government, CMAs play a key role in overcoming fragmented planning and effectively integrating transportation and land use planning at the county level.

The CMP pursues the interrelated goals of managing congestion, reducing single-occupant vehicle trips and improving alternative modes through a combination of capital roadway, transit, bicycle and pedestrian improvements, which are designed to maintain the existing transportation system where possible, and only add new travel lanes where road-widening is the only solution available to improve the transportation network. In addition, the CMP is intended to improve land use planning, develop strategies to reduce traffic demand, and when necessary, establish Multimodal Improvement Plans[1] to address deficiencies according to CMP standards. By addressing these congestion, transportation demand, land use and transportation decision-making issues early on, larger problems that could result in more expensive and less effective solutions may be avoided.

The CMP benefits the local governments, employers, businesses, developers, environmentalists and labor unions in the region. The CMP gives local governments the ability to establish a rational transportation funding process with clear priorities that makes transportation funding more reliable and brings it one step closer to home. A seven-year Capital Improvement Program (CIP) was established to give employers the confidence that local transportation facilities will be maintained and improved as needed. Businesses are assured that transportation investments will contribute to the efficient movement of freight throughout the region, which will improve the economic climate of the county. The CMP creates a "level playing field" that ensures all new development projects in the county are evaluated equally and equitably. On the environmental side, the CMP evaluates individual and cumulative transportation, land use, and air quality impacts due to new development projects. And lastly, the CMP maximizes local, state, and federal transportation dollars to create new construction jobs that will ultimately improve mobility.

The establishment of CMAs, in conjunction with changes in State and Federal transportation funding procedures, shifted decision-making from the State to the regional and local levels. Not only does this mean more money is available for local planning projects, but it also means that

[1] VTA uses the term "Multimodal Improvement Plan" for "Deficiency Plan" as defined by state legislation, to highlight the range of multimodal solutions available to Member Agencies that have a traffic LOS deficiency. See Chapter 10 for more details.

local governments have more flexibility and autonomy to spend this money on projects that benefit their local communities. It also gives citizens an opportunity to provide meaningful input in the decision-making process.

VTA CONGESTION MANAGEMENT PROGRAM

The CMA Statute states that all urbanized counties may create or designate a CMA by resolution of the County Board of Supervisors and a majority of City Councils representing a majority of the population in the incorporated county. Santa Clara County was the first county in the state to form a CMA, and the only county in the state to form a CMA prior to the passage of Proposition 111 in 1990. This accomplishment was possible only after months of collaborative effort by a joint committee of elected officials who were members of the County Transportation Commission and the Golden Triangle Task Force.

The committee met weekly from December 1989 to May 1990 to develop a consensus on the purpose, structure, and goals of the new agency. Their vision for the CMA - "A United Proposal for a Congestion Management Agency for Santa Clara County" - was submitted to all city councils and the Board of Supervisors for ratification. By July 1990, the proposal had been ratified by all 15 cities and a majority of the population in Santa Clara County. As a result, the Santa Clara County CMA was formed. In August 1991 the CMA Board subsequently drafted and adopted a joint powers agreement, which was ratified by the 15 cities/towns and the County Board of Supervisors.

In December 1994, the fifteen cities/towns and the County of Santa Clara passed resolutions designating the Santa Clara County Transit District as the CMA for Santa Clara County. On January 1, 1995 the two agencies formed what was to become the Valley Transportation Authority (VTA). Staff within VTA's Planning & Program Division now performs the functions previously performed by the CMA staff.

The VTA Board of Directors consists of elected governing board officials from VTA's Member Agencies, which are the 15 cities and towns within Santa Clara County and the County of Santa Clara. Membership attempts to balance regional representation and population, and all jurisdictions within the county have representation on the Board. The Board consists of 12 voting members with alternates, with 10 positions representing the 15 cities/towns within the county and the remaining two positions representing the County of Santa Clara. Board members are appointed by the jurisdictions they represent. In addition, the Board includes three ex-officio, non-voting positions representing the Metropolitan Transportation Commission (MTC).

Given the range and complexity of the policy issues they deal with, the VTA Board of Directors has established a set of committees to advise it on policy matters and to provide for in-depth review of individual issues before the Board of Directors takes final action.

Advisory Committees

The Board has established five advisory committees to provide it advice and perspective: Bicycle and Pedestrian Advisory Committee (BPAC); Citizens Advisory Committee (CAC); Committee for Transportation Mobility and Accessibility (CTMA); Policy Advisory Committee (PAC); and Technical Advisory Committee (TAC).

- BPAC consists of sixteen members, one individual representing each Member Agency local bicycle and pedestrian advisory committee. The BPAC advises the VTA Board on planning and funding issues related to bicycle and pedestrian mobility and access. The BPAC also serves as the bicycle and pedestrian advisory committee for the County of Santa Clara.

- CAC is a 17 voting member committee representing the residents of Santa Clara County, as well as specified community stakeholder groups with an interest in transportation including business, labor, environmental, and community interests. The CAC advises the VTA Board on issues impacting the communities and organizations they represent. It also serves as the independent Citizens Watchdog Committee for the 2000 Measure A Transit Improvement Program, and as the 2008 Measure D ballot-specified advisory body that reviews and comments on VTA's comprehensive transit program as part of the countrywide transportation plan.

- CTMA consists of seven representatives of human services organizations, seven representatives that are either senior citizens or individuals with disabilities, and three representatives from either category. It advises the Board on transportation mobility and accessibility issues for senior citizens and persons with disabilities, paratransit services, accessibility to VTA transit services, and VTA's efforts to comply with the federal Americans with Disabilities Act (ADA).

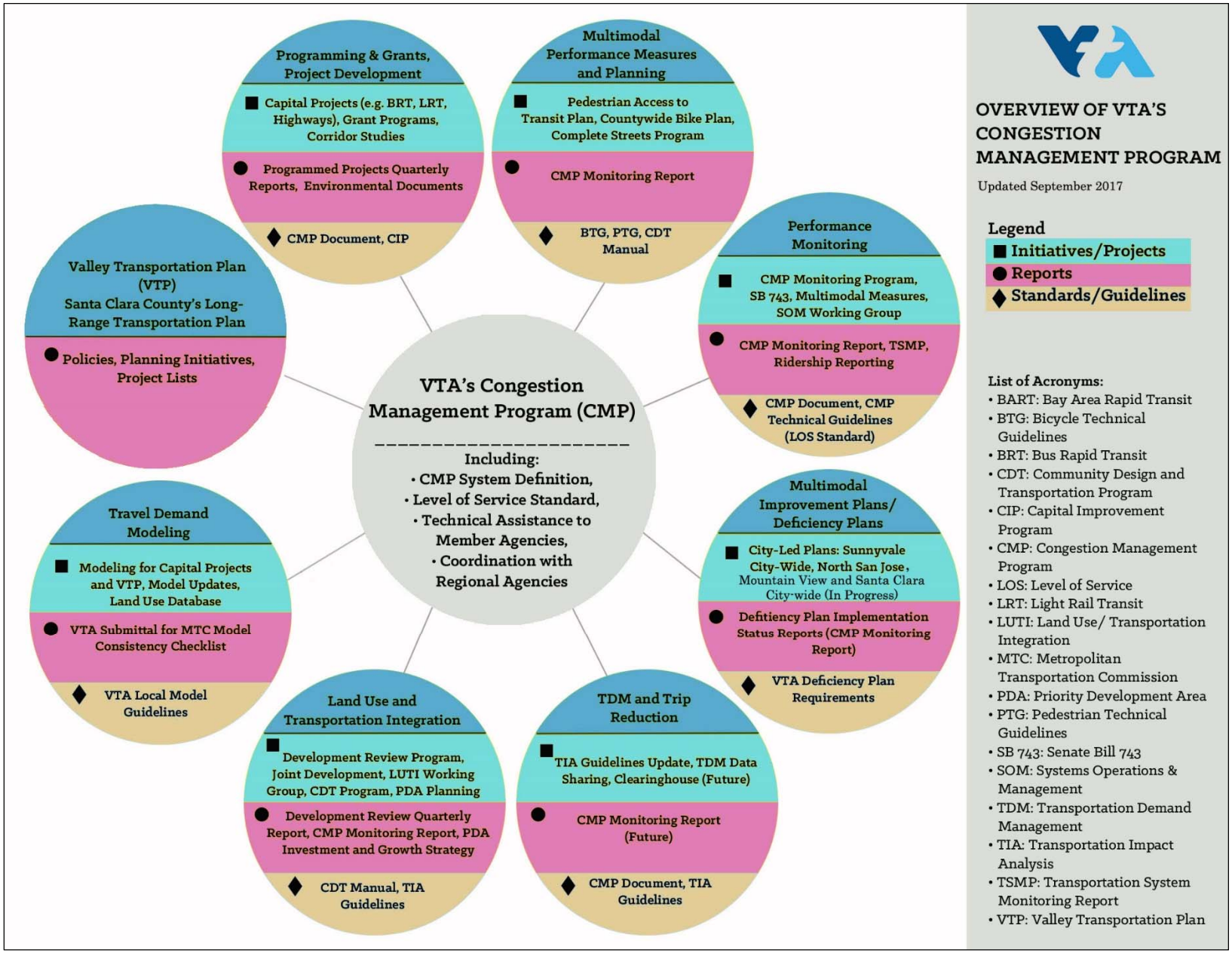
- PAC consists of one elected governing board member from each of VTA's Member Agencies. It ensures that all local jurisdictions have the opportunity to participate in the development of VTA's policies.

- TAC consists of one senior management level staff member (generally the public works, planning or transportation director) from each Member Agency. The TAC provides technical expertise on transportation projects, programs, funding, and other policy matters.

Over the past several years, VTA has worked with Member Agencies to develop policies, programs, and methodologies to promote multimodal transportation planning and land use/transportation integration. A representation of these efforts and how they relate to the CMP is provided in Figure 2.1, below. Some of the initiatives have included:

- Developing a Transit Sustainability Policy (TSP) that sets the policy framework for monitoring existing transit service and implementing new transit service in Santa Clara County;
- Working with local agencies to plan for infill development around existing transit stations through the Joint Development Program;
- Working with local agencies to update the CMP Deficiency Plan Requirements and Transportation Impact Analysis (TIA) Guidelines;
- Promoting the principles and design criteria included in the Community Design and Transportation (CDT) Manual of Best Practices for Integrating Transportation and Land Use;
- Working with ABAG and MTC to encourage infill development around the core transit network through the Priority Development Area (PDA) Investment & Growth Strategy.

FIGURE 2.1 | OVERVIEW OF VTA'S CONGESTION MANAGEMENT PROGRAM



CMP ROADWAY NETWORK

The CMP Statutes require that all state highways and principal arterials be part of the CMP roadway network. The statute also specifies that roadways can be added to the CMP roadway network in the future. However, once a roadway is added to the network it may not be removed.

Figure 2.2 and Figure 2.3 show the CMP roadway network and intersections, respectively. The network consists of four types of facilities: freeways, county expressways, urban arterials, and rural highways. The roadway network was adopted as part of the 1991 CMP. Since 1991 improvements have been made to the network, including:

- In 1995, SR 85 was completed, Highway 87 was extended from Almaden Expressway to SR 85, and Highway 237 was upgraded to full freeway status from Highway 101 in Mountain View to Highway 880.
- In 1998, Wolfe Road between Stevens Creek Boulevard and I-280 in Cupertino was added to the network.
- Between 2005 and 2007 carpool lanes were added on Highway 87.
- In 2012 the SR 237/I-880 connector express lane opened.
- In 2013 carpool lanes were added to I-880 between SR 237 and US 101.

Appendix B lists the roadway segments that are part of the roadway network. The CMP roadway network is monitored regularly to ensure that the roadway network conforms to the CMP auto level of service standard.

The definition of principal arterial is left to individual CMAs. VTA defines urban arterials as roadways that connect with the freeway and/or county expressway system and principal arterials. To be classified as a principal arterial the road must meet one of the following criteria:

- State highway;
- Six-lane facility; or
- Non-residential arterial with average daily traffic (ADT) of 30,000 vehicles per day or greater.

FIGURE 2.2 | CMP ROADWAY NETWORK

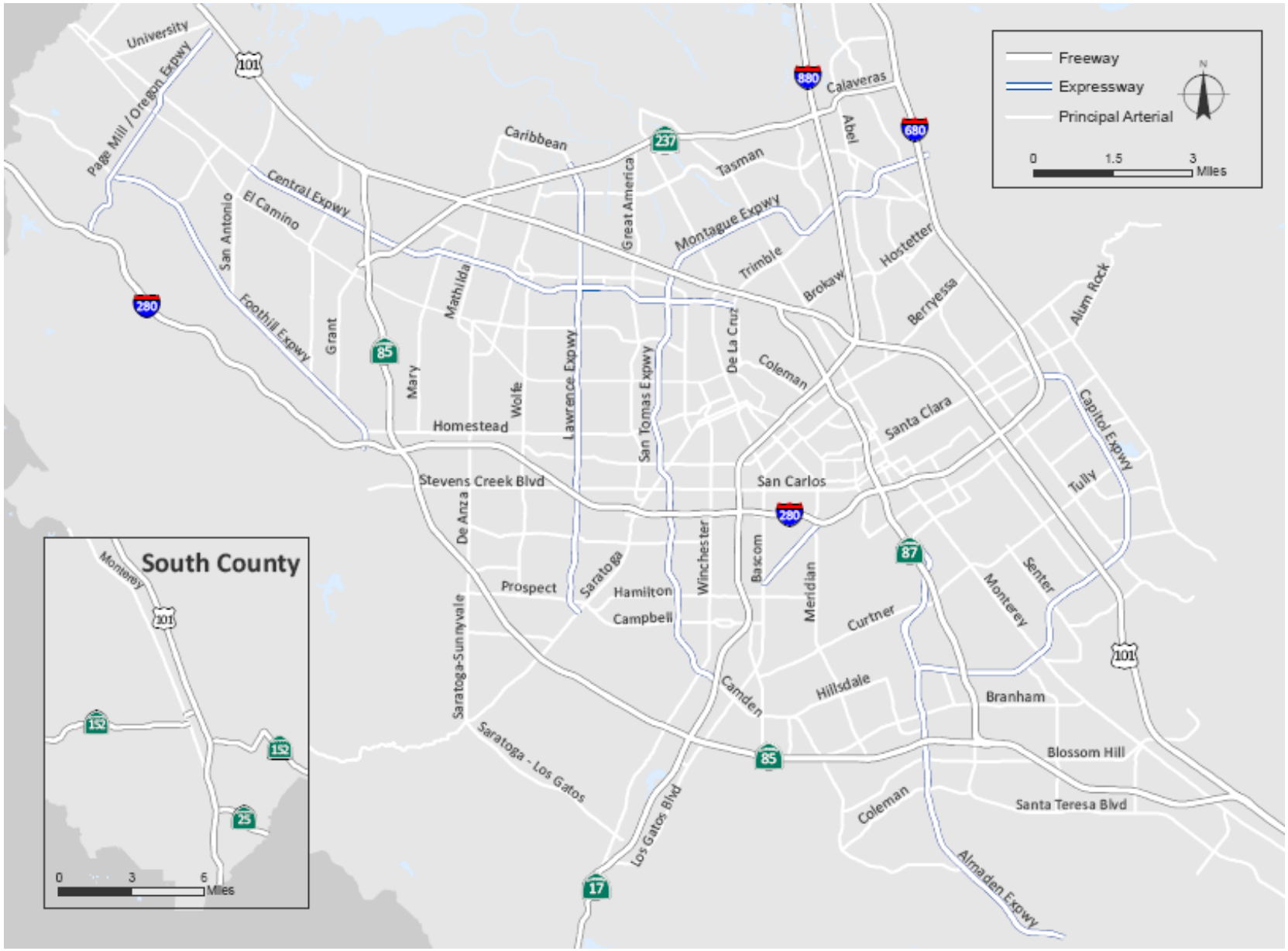
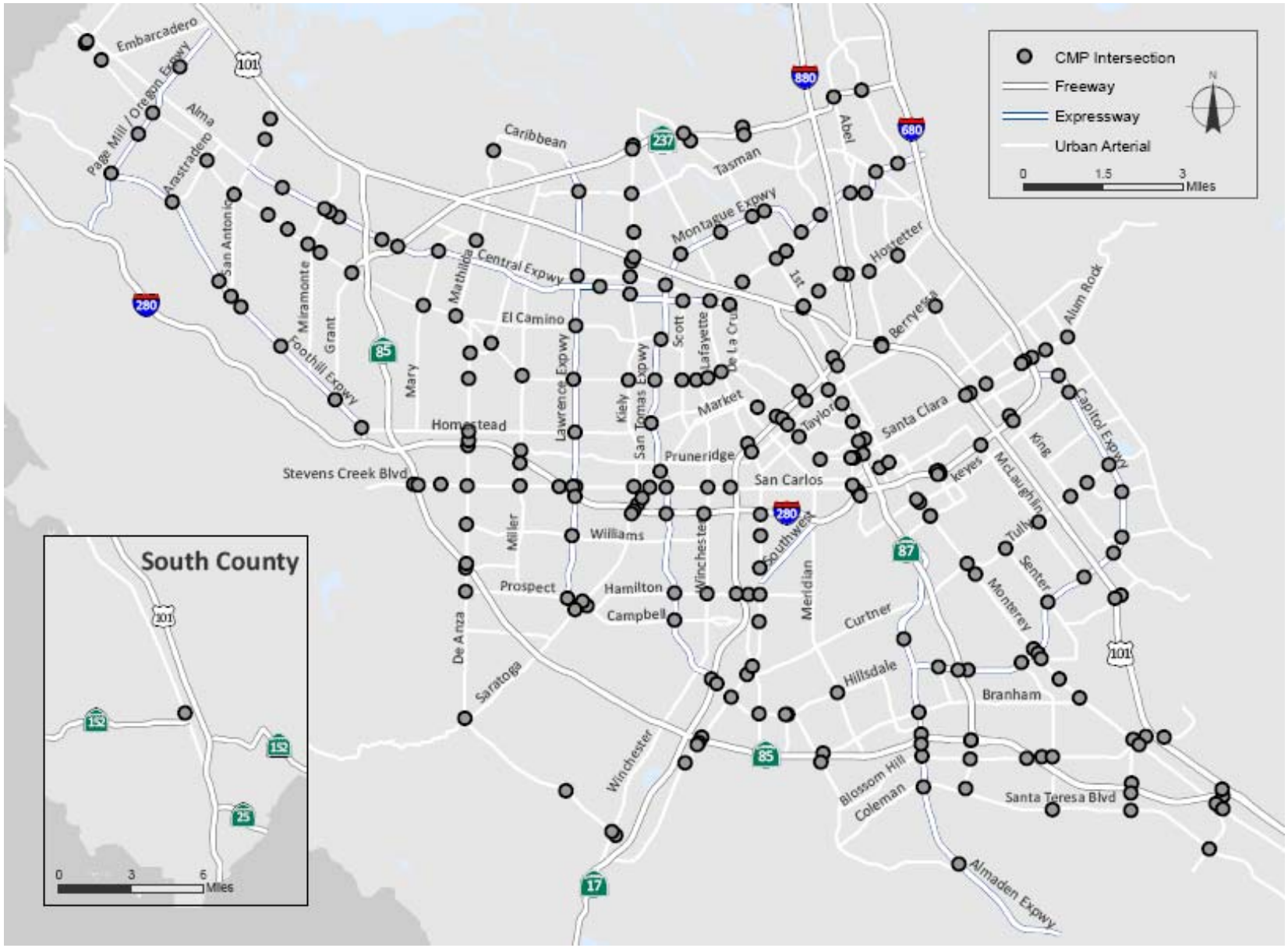


FIGURE 2.3 CMP INTERSECTIONS



CMP TRANSIT NETWORK

The CMP statute does not require adoption of a transit network, but does emphasize the importance of transit service. Furthermore, legislation enacted in 1994 requires that CMPs include multimodal transportation system performance measures which incorporate "measures established for the frequency and routing of public transit, and for the coordination of transit service provided by separate operators." (Gov. Code 65089 (b) (2)). As a result, the VTA CMP contains a transit network. The CMP transit network consists of rail transit service (Caltrain, Light Rail, and future BART service) and bus service (grid routes and regional routes). The CMP transit network is illustrated in Figure 2.4. Appendix C lists the routes that are part of the transit network.

EXISTING TRANSIT SERVICE

Santa Clara County is currently served by two major transit operators: the Santa Clara Valley Transportation Authority (VTA) and Caltrain. VTA operates public transit buses, light rail, shuttles, and paratransit within Santa Clara County, as well as providing transit service to major regional destinations and transfer centers in adjoining counties. There are a number of other operators that provide some service within Santa Clara County. Brief descriptions of the different existing services and operators are provided below.

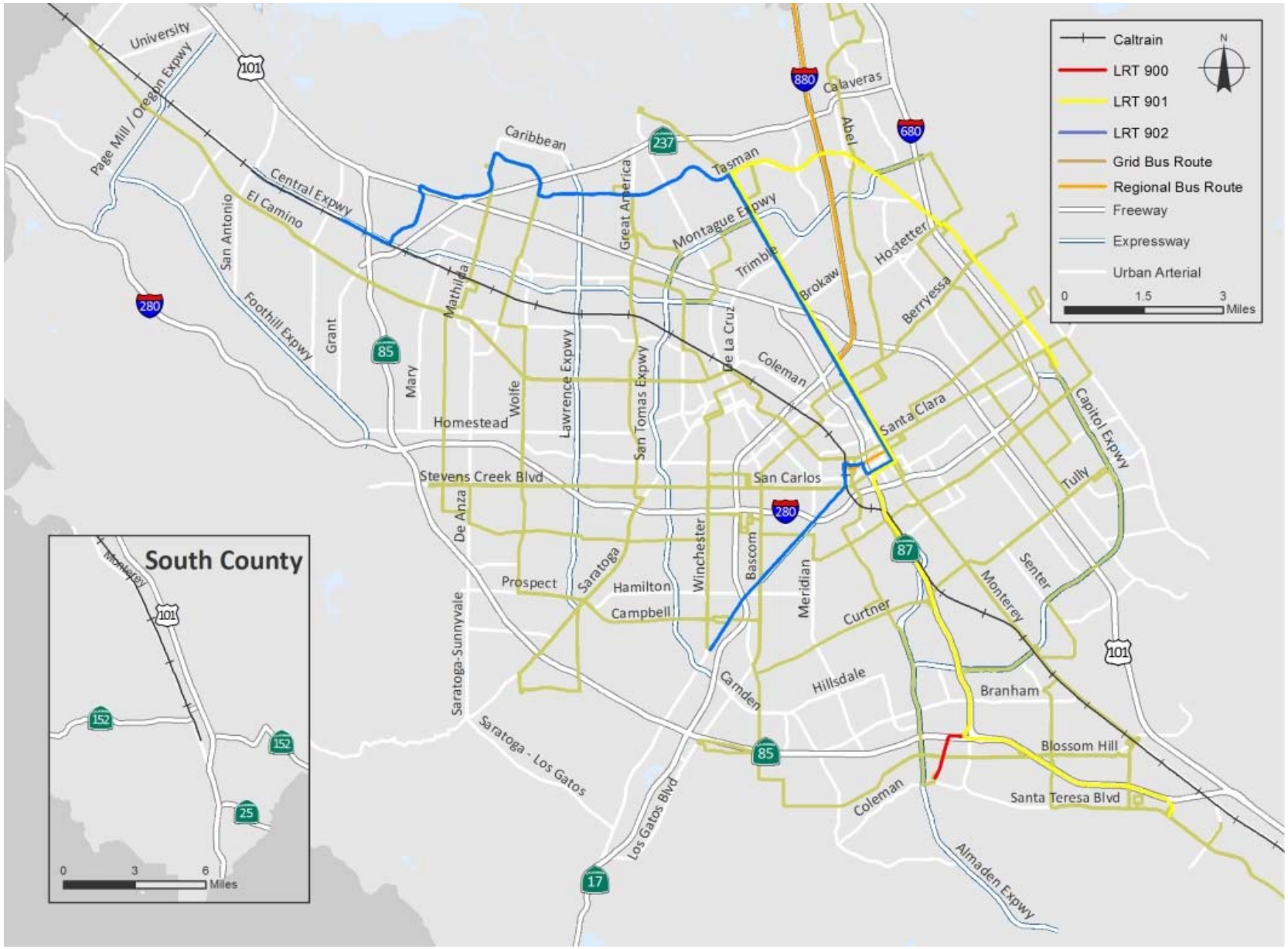
VTA Light Rail — VTA currently operates a 42-mile light rail system linking South San Jose, East San Jose, Downtown San Jose, North San Jose, Campbell, Santa Clara, Milpitas, Sunnyvale, and Mountain View.

VTA Core/Grid Bus Routes — Operated by VTA, core grid routes are the lifeblood of the bus route network. These routes are typically long mainline routes that operate along major corridors and serve the urbanized areas of Santa Clara Valley. They are relatively straight, evenly spaced bus routes operate from early morning into the late evening. Line 22, a grid line, provides the highest ridership line in the bus system. This route provides east-west service along El Camino Real, Santa Clara Street, and Alum Rock Avenue between the Eastridge Shopping Center in San Jose and the Palo Alto Transit Center.

VTA Regional Bus Service — Regional bus routes serve intercity, long distance trips. Two regional bus routes are currently included in the CMP transit network: Highway 17 Express and the Dumbarton Bridge Express (described below) are operated and funded jointly with neighboring counties and transit operators.

Dumbarton Express Bus (DB) — VTA is a member of a consortium including Alameda-Contra Costa Transit District (AC Transit), BART and Union City Transit. This group is responsible for funding and overseeing the operation of the Dumbarton Bridge (DB) weekday express bus services, DB and DB

FIGURE 2.4 | CMP TRANSIT NETWORK



1. These express buses link the Union City BART station in Alameda County to the Palo Alto Transit Center, Stanford University and the Stanford Research Park.

Highway 17 Express Bus Service — VTA and the Santa Cruz Metropolitan Transit District (SCMTD) jointly fund and oversee the operation of the Highway 17 Express bus service between the cities of Santa Cruz, Scotts Valley, and downtown San Jose.

Caltrain — Caltrain operates 77 miles of commuter rail service between San Francisco and San Jose throughout the day and extended rail service from San Francisco to Gilroy during commute periods. The service is operated under the authority of the Peninsula Corridor Joint Powers Board (JPB) consisting of VTA, SamTrans and San Francisco MUNI. SamTrans acts as the operator of the service on behalf of the JPB. On an average weekday, Caltrain operates 92 trains - including 22 Baby Bullet trains, which provide limited stop service along the corridor.

SamTrans — San Mateo County Transit District (SamTrans) provides bus service in San Mateo County, including connections at the Palo Alto Transit Center in Santa Clara County.

AC Transit Service — Alameda-Contra Costa Transit District (AC Transit) provides bus service within Alameda County and provides connections to VTA transit facilities in Milpitas, including VTA's LRT and local buses at the Great Mall Transit Center.

Altamont Corridor Express (ACE) — The Altamont Corridor Express (ACE) rail service is overseen by a Joint Powers Authority created by the Alameda County Congestion Management Agency, VTA, and the San Joaquin Regional Rail Commission. ACE service extends approximately 85 miles from Southern San Joaquin County through the Tri-Valley area and Alameda County to Santa Clara County's Great America, Santa Clara University and San Jose Diridon stations. The service operates four round trips daily during the weekday peak commute periods. The trains operate in the peak direction only, originating in Stockton during the morning peak period and leaving San Jose Diridon Station during the evening peak period. Eight ACE Shuttle routes, operated by VTA, provide "last mile" connections from the Great America station to destinations throughout northern Santa Clara County.

Capitol Corridor Intercity Rail Service — Capitol Corridor is 170 mile commuter rail service that links Sacramento, Oakland and San Jose (Santa Clara/Great America and San Jose Diridon stations). The service is managed by BART and VTA is a member of the Joint Powers Board, which oversees the service. The Capitol Corridor intercity rail service provides seven daily round trips from Sacramento via Oakland to San Jose and additional daily round trips from Sacramento to Oakland with connecting motorcoach bus service to San Jose.

PLANNED TRANSIT IMPROVEMENTS

There are a number of transit improvements and capital projects planned within Santa Clara County in the coming years. The following is a description of several planned improvements. This section is not meant to be an exhaustive list, but rather to highlight key projects in the planning and/or design stages.

BART Silicon Valley – VTA has partnered with BART to develop an extension of the rail system from Fremont to Santa Clara via Milpitas and San Jose. The planned 16.1-mile extension of the BART system will operate along the existing railroad alignment south of the BART Warm Springs Station in Fremont, continue in a tunnel through downtown San Jose, and end near the Santa Clara Caltrain Station. The BART extension from Fremont to Warm Springs is now complete. The extension from Warm Springs to Santa Clara County will be delivered in two phases. The first phase of the extension, from Warm Springs to Berryessa, broke ground in 2012 and is expected to be complete by 2018. VTA is currently conducting the environmental analysis of the second phase in the BART to Silicon Valley project, a 6-mile link from Berryessa to Downtown San Jose, Diridon Station, and the Santa Clara station near the Mineta San Jose International Airport. This section includes 5 miles of tunnel construction.

Light Rail Enhancement Project — VTA's Light Rail Enhancement Project is advancing a series of capital improvements and service changes that were recommended in the 2010 Light Rail Improvement Plan. These changes are necessary to support anticipated growth in the county, including increased density in key areas identified by local governments, as well as the opening of the San Francisco 49ers Levi's Stadium, and the upcoming extension of BART service to Silicon Valley. Investment in these capital improvements and new service will enable VTA to meet increased ridership demand and improve the system for current riders. Current modeling projects that these changes, when fully implemented, will result in travel time savings of as much as 20 - 30% between key origins and destinations.

The Light Rail Enhancement Project will focus on the following key improvements:

- Initiating a new operating plan to serve the anticipated increase in ridership from the BART Silicon Valley Extension. This will include adding a new line to the Light Rail system to provide a direct connection from the future Milpitas BART station to destinations in Santa Clara, Sunnyvale and Mountain View.
- Speed and reliability improvements along North First Street in San Jose.
- Safety and reliability improvements in Downtown San Jose.
- Signal timing and other speed improvements system-wide.

Bus Rapid Transit — Bus Rapid Transit (BRT) refers to a combination of capital and service design improvements, designed to provide faster, more efficient service than standard bus transit. VTA

implements BRT projects in phases, with the first Rapid phase focusing on service design improvements such as simple/direct routing, limited stops, frequent headways, generous hours of operation, and specialized vehicles. These service design improvements are paired with transit signal priority measures, queue-jump lanes, and other small-scale corridor infrastructure improvements to increase the route's speed as a Rapid service. The second BRT phase involves more significant corridor infrastructure improvements, including dedicated transit lanes and upgraded stations, to prioritize transit in the corridor. VTA's Rapid 522 is VTA's first implementation of Rapid service. The line serves El Camino Real, The Alameda, Santa Clara Street and King Road between Palo Alto and the Eastridge Shopping Center in San Jose. The route also features a BRT segment between Downtown San Jose and the Eastridge Transit Center with a dedicated lane segment and upgraded stations.[2]

Building on the success of Rapid 522, VTA will implement two new Rapid services in mid-2018, both connecting to the Berryessa BART station in North San Jose. Rapid 523 will provide a fast and frequent connection between Berryessa BART and downtown San Jose, Stevens Creek Boulevard, De Anza College, downtown Sunnyvale, and Lockheed Martin Transit Center. Rapid 500 will provide fast and frequent service between Berryessa BART, downtown San Jose, and San Jose Diridon Station.

Transit Network Redesign – In mid-2018, concurrent with the opening of the Silicon Valley Berryessa BART Extension, VTA will implement a completely redesigned transit network aimed at maximizing ridership by prioritizing frequent service along transit-supportive corridors. Along with the new transit service network, VTA will implement a number of changes designed to make the transit network easier to understand and use, including a redesigned transit map, new bus stop signage, and new transit hand schedules.

Frequent Transit Network – As part of its transit system redesign for implementation in mid-2018, VTA will introduce a new network of frequent routes that will form the backbone of VTA's transit network. These bus and light rail routes will operate along transit-supportive dense urban arterials every 15 minutes or better on weekdays, and will collectively form a grid to maximize the number of trips possible on the transit network.[3]

Caltrain Modernization Program – This project includes the electrification of the existing Caltrain corridor between the 4th and King Station in San Francisco and Tamien Station in San Jose, upgrades to Caltrain's signaling system, construction of overhead catenary, and the replacement of a majority of Caltrain's diesel trains with high-performance electric trains. These improvements will support a blended High Speed Rail/Electrified Caltrain rail system on the existing two track configuration. These

[2] This service is termed 'BRT 1' in VTA's *Service Design Guidelines.*

[3] This network of frequent routes will be implemented in mid-2018 filling the role of VTA's existing Core Network.

investments will realize early implementation of modernized electrified Caltrain service by 2022, reduce noise and air pollution, minimize impacts on surrounding communities, reduce project costs, and expedite the implementation of High Speed Rail.

High Speed Rail - VTA has also coordinated with the State High Speed Rail Authority (HSRA) on their efforts to develop high-speed rail service from Southern California to San Francisco. VTA's stake in High Speed Rail (HSR) comes in several areas:

- VTA will work with the HSRA, the JPB and local cities on planning and engineering studies defining capital improvements in the alignment and an ultimate corridor "footprint".
- VTA will work with the JPB and local cities on specific HSR projects, such as grade separations, impacting local road systems and the rail alignment.
- VTA will work with cities on station area plans and land use issues.

CMP BICYCLE NETWORK

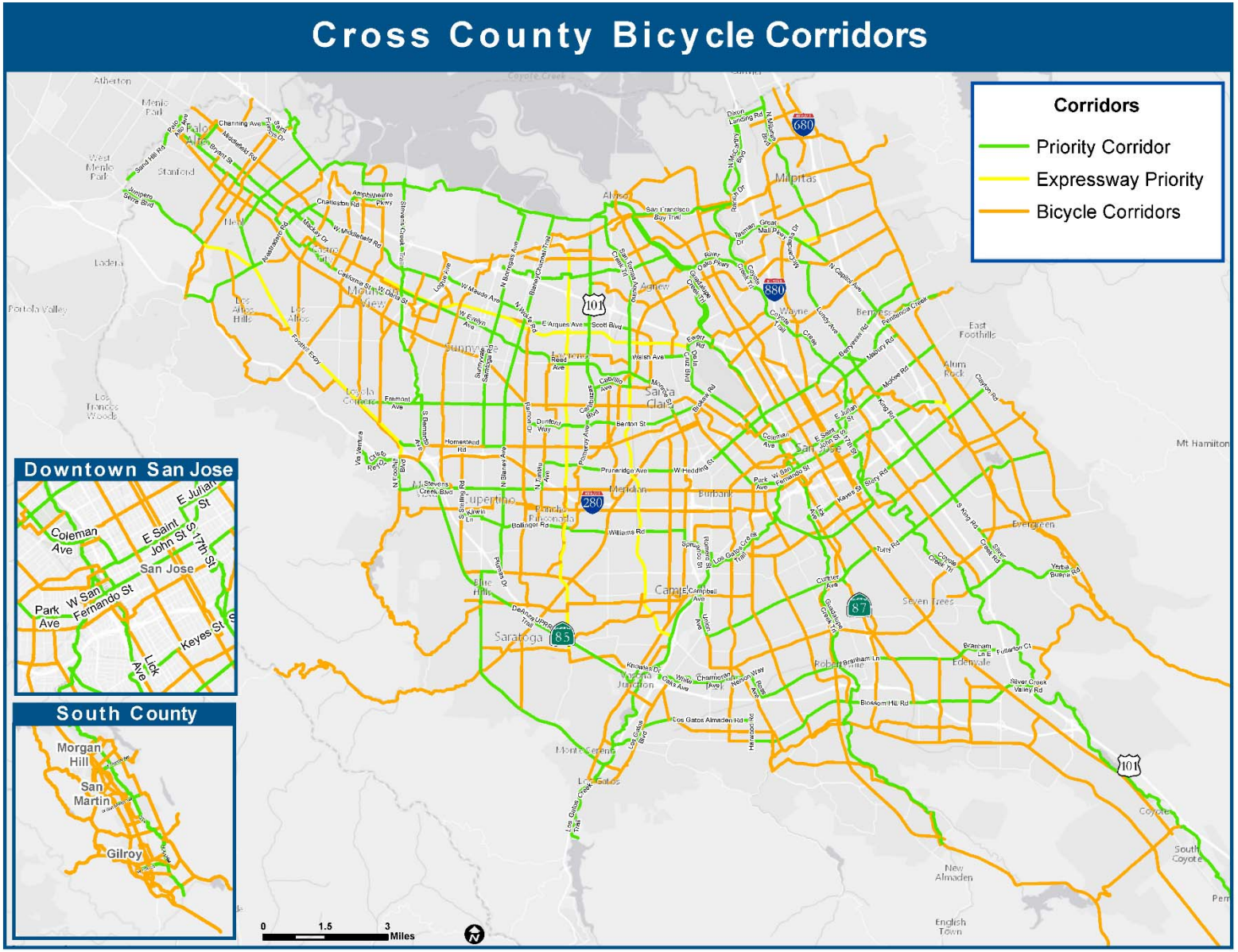
Bicycles play a significant role in the transportation system. They provide direct transportation as well as access to transit services. Therefore, while not a requirement of the CMP Statute, VTA has included a bicycle network as part of its CMP Transportation System.

VTA is currently in the process of updating the Santa Clara Countywide Bicycle Plan (CBP), which was last adopted in 2008. The CBP identifies Cross County Bicycle Corridors (CCBC) and barriers to bicycle route connectivity which require improvements such as freeway interchanges, or bridges without bicycle facilities. The current update expands the plan in several ways, and is a collaborative effort between VTA, Member Agencies, and members of the public. The update focuses on bicycling for all ages, and adds new low-stress corridors to the CCBCs. The update also uses a geographic analysis and public input to prioritize CCBCs, and sets expectations for the quality of bicycle infrastructure on priority CCBCs. The update will also include an implementation plan, and showcase out-of-the-box projects to inspire the community, elected officials, and city staff.

The draft 2017 CCBCs are shown in Figure 2.5. Priority corridors are highlighted.

The Countywide Bicycle Plan forms the basis for the financially constrained list of bicycle projects considered for Valley Transportation Plan 2040 (VTP). This list, the Bicycle Expenditure Program (BEP), will be updated with the next update of the VTP. Additionally, projects within the Countywide Bicycle Plan are eligible to compete for 2016 Measure B Bicycle and Pedestrian funds.

FIGURE 2.5 | CROSS COUNTY BICYCLE CORRIDORS



CHAPTER 3 | TRANSPORTATION ANALYSIS STANDARDS ELEMENT

This chapter describes VTA's Congestion Management Program (CMP) transportation analysis standards. It includes the following five sections:

- CMP Transportation Analysis Standards – Current Practice and Potential Future Updates
- CMP Auto Level of Service Standards
- CMP Auto Level of Service Evaluation Techniques
- CMP Roadway Network Level of Service
- Compliance and Conformance

CMP TRANSPORTATION ANALYSIS STANDARDS – CURRENT PRACTICE AND FUTURE UPDATES

BACKGROUND

For the purpose of congestion monitoring and management, the CMP statute requires that CMAs develop a minimum auto level of service (LOS) standard for CMP Network roadways. Government Code Section 65089 (b) states that the CMP shall contain "Traffic level of service standards established for a system of highways and roadways designated by the agency." In addition, the CMP statute states that "In no case shall the LOS standards established be below the level of service E or the current level, whichever is farthest from level of service A." Thus, the statutes also allow for CMP System facilities that were operating at LOS F during the baseline year to remain at LOS F.

The CMP statute was amended in 1994 (Assembly Bill (AB) 1963, Katz) to require that the CMP include multimodal transportation system performance measures. Although VTA satisfied this requirement by establishing CMP Performance Measures for Santa Clara County (see Chapter 3), these performance measures are informational in nature and are not used to determine Member Agency conformance with the CMP in the Monitoring or Land Use Impact Analysis Programs. The CMP auto LOS standard is the only transportation analysis standard used to determine conformance with the CMP.

The CMP auto LOS standard is used by Member Agencies to analyze transportation impacts and mitigation measures for CMP facilities both when preparing a Transportation Impact Analysis (TIA) report for CMP purposes and when analyzing environmental impacts of a project per the California Environmental Quality Act (CEQA). The CEQA Guidelines establish the link between CEQA and the CMP by including the following question in the Appendix G Checklist:

- "Would the project… b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?"

SENATE BILL (SB) 743 – CHANGES TO TRANSPORTATION ANALYSIS IN CEQA

In September 2013, the California legislature enacted Senate Bill (SB) 743, directing the Governor's Office of Planning and Research (OPR) to develop new significance criteria to evaluate transportation impacts under CEQA. Notably, the bill states that once the new criteria are adopted, "Automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment" in the locations where the new criteria will apply (21099 (b) (2)). SB 743 gave OPR discretion to determine the specific metric(s) to replace LOS, based on the criteria that the new metric(s) "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses" (21099 (b) (1)). In addition, the bill required that the new metric(s) apply within Transit Priority Areas[1] but allowed OPR to apply the new metrics in other locations as well. OPR released a *Preliminary Evaluation of Alternative Methods of Transportation Analysis* in December 2013, which included an initial discussion of various alternative metrics such as vehicle miles traveled (VMT), automobile trips generated, multimodal level of service, fuel use, motor vehicle hours traveled, and a presumption of less than significant impacts based on location.

Recognizing the magnitude of this change to transportation analysis on the horizon, VTA brought informational presentations on SB 743 to the Systems Operations & Management (SOM) and Land Use / Transportation Integration (LUTI) Working Groups, VTA Advisory Committees and the Congestion Management Program and Planning Committee (CMPP) in early 2014. VTA staff also participated in Bay Area CMA staff-level working groups on SB 743 and was involved in discussions of SB 743 through the Bay Area CMA Directors and Bay Area CMA Planning Directors meetings. In addition, VTA staff engaged the Governor's Office of Planning and Research (OPR) directly through phone calls and submitted a comment letter in April 2014 addressing potential statewide implementation of new metrics, threshold-setting, and impacts to transit facilities.

In August 2014, OPR released a *Preliminary Discussion Draft of Updates to the CEQA Guidelines Implementing Senate Bill 743*. This document indicated that OPR intended to replace LOS with VMT in the evaluation of transportation impacts, and that the new criteria would apply statewide. Specifically, the document suggested the following transportation impact thresholds:

[1] See Appendix A – Glossary for definition.

- Land use development projects that result in vehicle miles traveled greater than the regional average for that land use type may indicate a significant impact. Projects within ½ mile of frequent transit service, projects that reduce area-wide VMT, and land use plans that are consistent with the applicable Sustainable Communities Strategy may be presumed to have less than significant impacts.

- Transportation projects that include new general purpose highway or arterial lanes, and other projects that induce vehicle travel, may have significant impacts. Projects to primarily improve safety or operations and multimodal (transit, bicycle or pedestrian) improvements may be presumed to have less than significant impacts.

The *Preliminary Discussion Draft* also included guidelines for the analysis of safety impacts, mitigation measures and alternatives.

VTA continued the process of engagement with Member Agencies, other Bay Area CMAs and OPR, and submitted a comment letter on the *Preliminary Discussion Draft* in November 2014. Overall, VTA supported OPR's effort to shift the emphasis of transportation analysis from LOS to VMT and apply the new criteria statewide. VTA also provided detailed comments on the link between CEQA and the CMP, the analysis of VMT impacts of land use and transportation projects, safety impacts, impacts on bicycle, pedestrian and transit facilities, mitigation measures, and the implementation process.

In January 2016, OPR released a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA.* This document is available on the OPR website at https://www.opr.ca.gov/s_sb743.php. VTA staff brought an update on SB 743 to VTA Advisory Committees and CMPP, and submitted a comment letter to OPR, in February 2016. In the letter, VTA encouraged OPR to move its process forward in a timely manner, offered suggestions regarding transit, bicycle and pedestrian analysis, commented on the role of Congestion Management Programs, and provided other detailed technical comments.

While OPR has not yet submittal final draft guidance to the Secretory of Natural Resources for rule-making as of September 2017, some cities (such as San Francisco, Oakland and Pasadena) have already changed their CEQA metrics and practices, and other cities (such as City of San Jose) are in the process. Based on indications from OPR, VTA expects that mandatory statewide implementation of VMT analysis to replace LOS analysis in CEQA will be phased in over the next few years. VTA will continue to monitor the SB 743 implementation process and provide assistance to Member Agencies in updating local CEQA standards, and considering potential changes to the CMP and Technical Guidelines as appropriate.

POTENTIAL UPDATES TO THE CMP IN RESPONSE TO SB 743

As noted above, the current CEQA Guidelines include an explicit linkage between the CMP and CEQA within the Appendix G Checklist. One question that remains to be resolved as SB 743 implementation moves forward is whether this link will be retained. However, with or without the explicit linkage, it will be desirable for the transportation analysis required by the CMP to be compatible with the transportation analysis required by CEQA.

During discussions with Member Agencies, Bay Area CMAs and OPR, the issue has been raised that a CEQA requirement to analyze and mitigate VMT impacts could be in conflict with the requirement in the CMP to maintain certain transportation facilities at LOS E. For example, a VMT threshold in CEQA leads to the goal to reduce the overall amount of vehicle travel generated by the project, which could incentivize developers to locate projects in infill locations within walking distance of existing jobs, homes, retail, services and transportation facilities. However, this strategy could result in additional traffic on CMP facilities already at LOS E or F, which could result in significant impacts according to CMP criteria. Similarly, to mitigate a facility back to compliance with the CMP LOS standard could require adding auto capacity in the form of additional turn lanes or through lanes, but such mitigation measures could also induce additional vehicle travel and degrade conditions for pedestrian, bicycle and transit modes, potentially increasing VMT.

In February 2015, legislation (AB 1098) was introduced that would amend California Statutes related to the CMP for consistency with the new CEQA metrics under development per SB 743. However, this bill did not advance through the legislative process. VTA will continue to monitor this issue and other legislation affecting the CMP that may be introduced in the future.

Regardless of the timing of amendments to the CMP statutes, VTA intends for the CMP to be compatible with the transportation analysis requirements of CEQA and support the stated goals of SB 743 to “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” The CMP auto LOS standard described in the remainder of this chapter should be considered one piece of the overall CMP toolkit for evaluating land use developments and transportation capital projects along with the Multimodal Performance Measures (Chapter 4), Transportation Demand Management (Chapter 5), Land Use and Transportation Integration efforts (Chapter 5), and Multimodal Improvement Plans (Chapter 10). Altogether, these elements of the CMP are designed to support a sustainable multimodal transportation system for Santa Clara County.

CMP AUTO LEVEL OF SERVICE STANDARDS

Auto Level of Service (LOS) describes the operations of roadway segments or intersections in terms of vehicle speed, volume and capacity, freedom of movement, and traffic delay. LOS measurements are given by letter designations, from A (least congested) to F (most congested).

The LOS standards for Santa Clara County were established in October 1991. The minimum level of service is LOS E, except for facilities grandfathered in at LOS F. The performance of the CMP facilities is monitored at a minimum every two years. If the minimum level of service cannot be maintained on a CMP roadway, Member Agencies must develop Multimodal Improvement Plans to remain in conformance with the CMP. For complete descriptions of the LOS grading scales for the CMP Roadway Network refer to Appendix E.

The LOS of each CMP facility was originally evaluated in the base year of 1991. Baseline trips were defined as the total number of vehicles trips for existing year 1991 traffic plus new trips generated from all approved projects. The baseline auto LOS is the point of comparison for determining conformance with the CMP auto LOS standard. Approved project traffic was included in the 1991 baseline to ensure that all traffic which would be added to CMP roadways was included in the analysis and to ensure that development projects that had received final land use approval would not penalized by the CMP. Existing 1991 data and any anticipated project traffic data were provided by Member Agencies.

The VTA CMP auto LOS standards consist of the following:

1. The CMP auto LOS standard is LOS E. This standard applies across the CMP roadway network, including freeways, urban arterials, County Expressways, and rural highways.
2. Facilities that have a baseline (1991) LOS F for the AM or PM peak period are allowed to remain at LOS F. These facilities are listed in Tables 3.1 and 3.2 and shown in Figures 3.1, 3.2, and 3.3 below. It is important to note these facilities are not exempt from California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) review requirements when applicable.
3. If the auto LOS for a CMP facility is currently LOS F and the facility is not included in an approved Multimodal Improvement Plan, then a project is said to impact the facility if it will cause changes to traffic conditions greater than the following thresholds:
    - **Intersections at LOS F:** addition of the project traffic increases the average control delay for critical movements by four (4) seconds or more, and project traffic increases the critical volume-to-capacity ratio (v/c) by 0.01 or more.

- **Freeway Segments at LOS F**: the number of vehicle trips added by the project is more than one percent of the freeway capacity (the calculation shall be for each direction of travel).
- **Rural Highway at LOS F:** the number of vehicle trips added by the project is more than one percent of the rural highway capacity.

It is important to emphasize that local land use and mitigation decisions can be made based on a stricter LOS standard if established by a Member Agency.

FIGURE 3.1 | FREEWAY SEGMENTS OPERATING AT LOS F IN THE 1991 BASELINE AM PEAK PERIOD

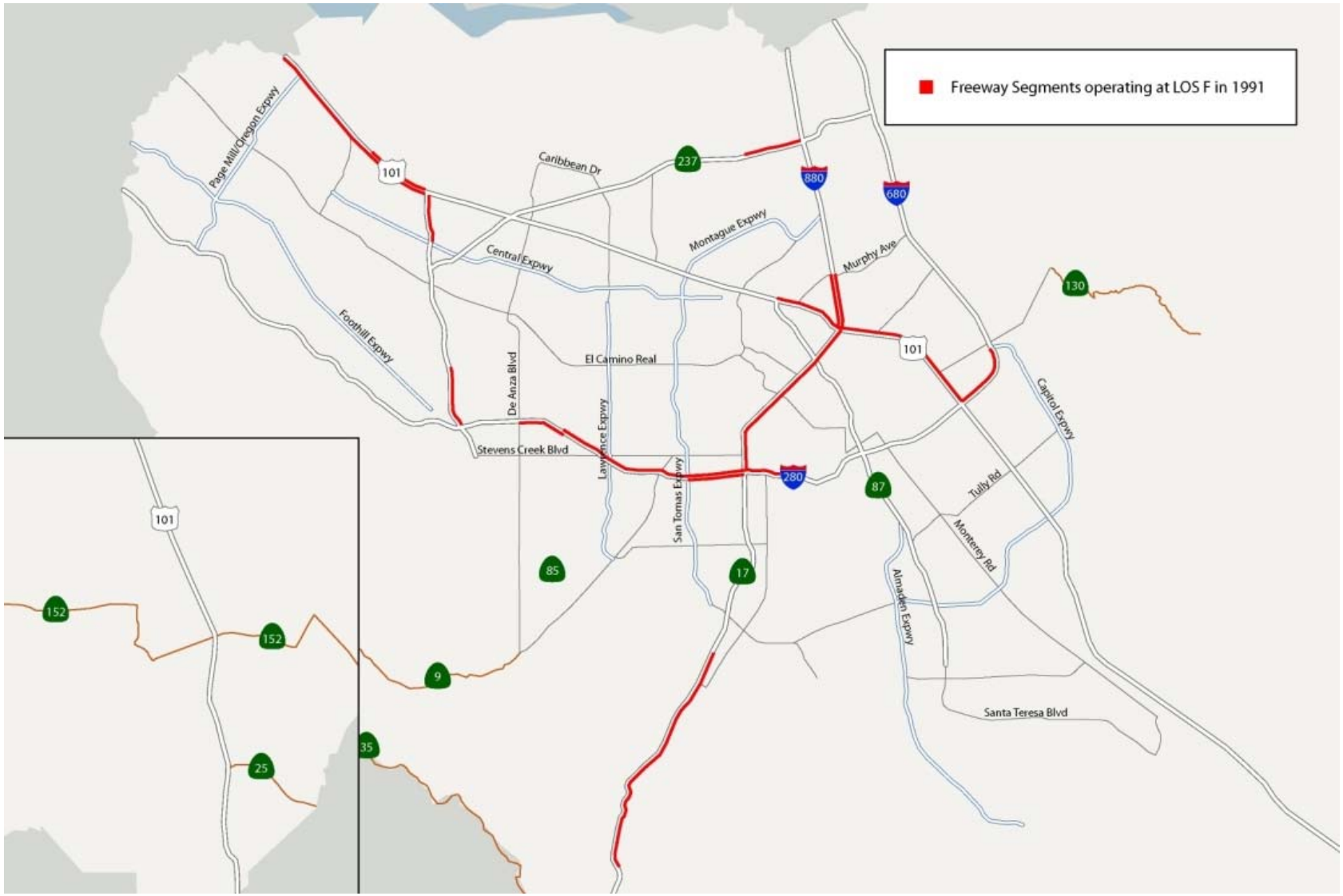


FIGURE 3.2 | FREEWAY SEGMENTS OPERATING AT LOS F IN THE 1991 BASELINE PM PEAK PERIOD

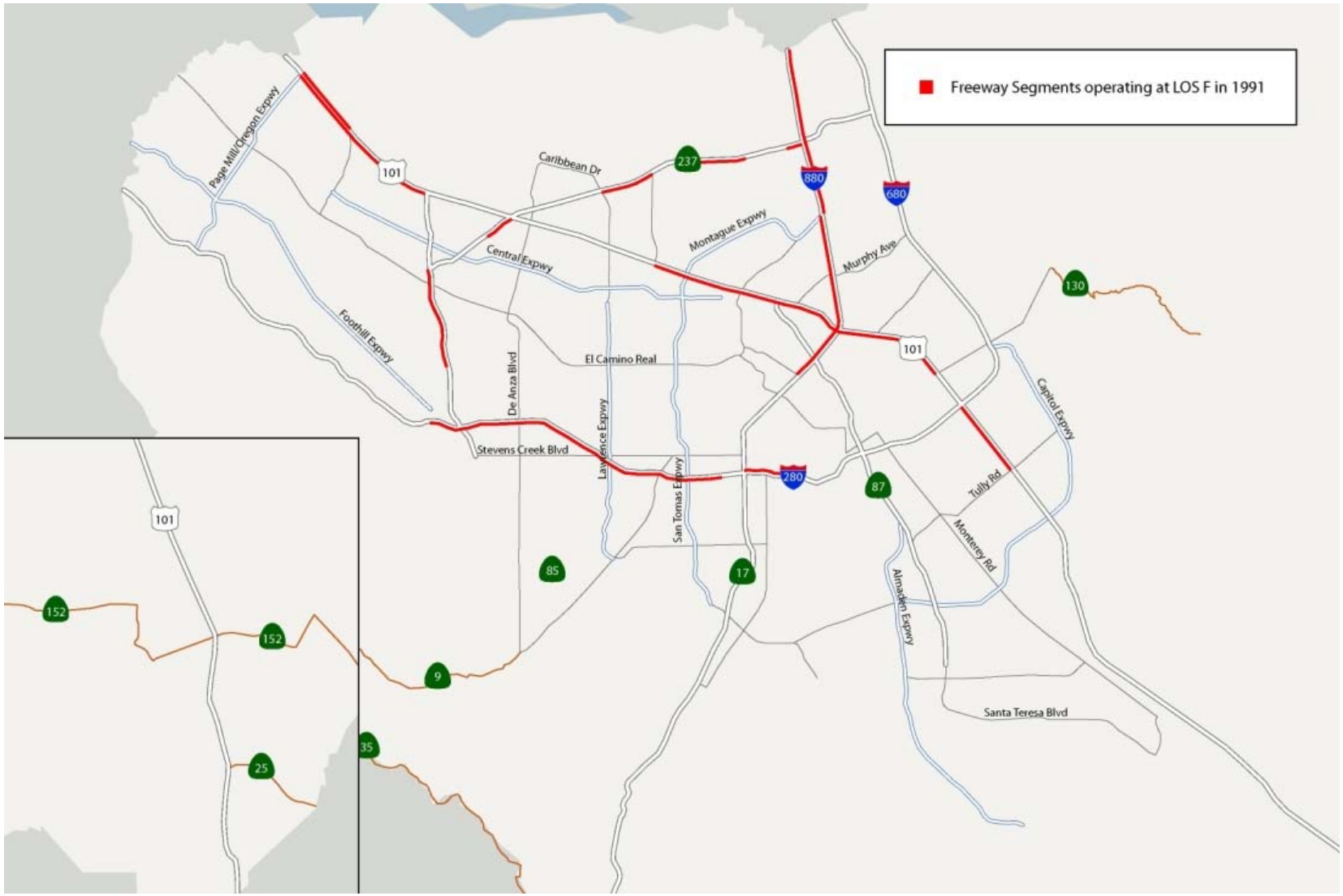


TABLE 3.1 | FREEWAY SEGMENTS AT LOS F IN EITHER 1991 BASELINE PERIOD

CMP ID	Facility	Dir	From/To	From/To	Miles	LOS F	
						AM	PM
1	I-880	NB	SR 237	Dixon Landing	1.99		X
2	I-880	NB	Great Mall Pkwy	SR 237	0.72		X
3	I-880	NB	Montague Expwy	Great Mall Pkwy	0.98		X
5	I-880	NB	US 101	E. Brokaw Rd	1.29	X	
6	I-880	NB	N. 1st ST	US 101	0.49	X	
7	I-880	NB	SR 87	N. 1st ST	0.4	X	
8	I-880	NB	Coleman Ave	SR 87	0.51	X	
9	I-880	NB	The Alameda	Coleman Ave	0.59	X	
10	I-880	NB	N. Bascom Ave	The Alameda	0.82	X	
11	I-880	NB	Stevens Cr	N. Bascom Ave	0.84	X	
12	I-880	NB	I-280	Stevens Cr	0.41	X	
16	I-880	SB	Montague Expwy	E. Brokaw Rd	1.35		X
17	I-880	SB	E. Brokaw Rd	US 101	1.29	X	X
18	I-880	SB	US 101	N. 1st ST	0.49		X
19	I-880	SB	N. 1st ST	SR 87	0.4		X
20	I-880	SB	SR 87	Coleman Ave	0.51		X
29	SR 17	NB	Saratoga	Lark Ave	1.81	X	
30	SR 17	NB	Bear Creek	Saratoga	2.9	X	
39	I-680	SB	King Rd	US 101	0.4	X	
40	I-680	SB	Capitol Expwy	King Rd	1	X	
77	SR 237	EB	McCarthy Blvd	I-880	0.4		X
79	SR 237	EB	N. First St	Zanker Rd	1.61		X
81	SR 237	EB	Lawrence Expwy	Great America Pkwy	1.27		X

FIGURE 3.3 | INTERSECTIONS OPERATING AT LOS F IN THE 1991 BASELINE PM PEAK PERIOD

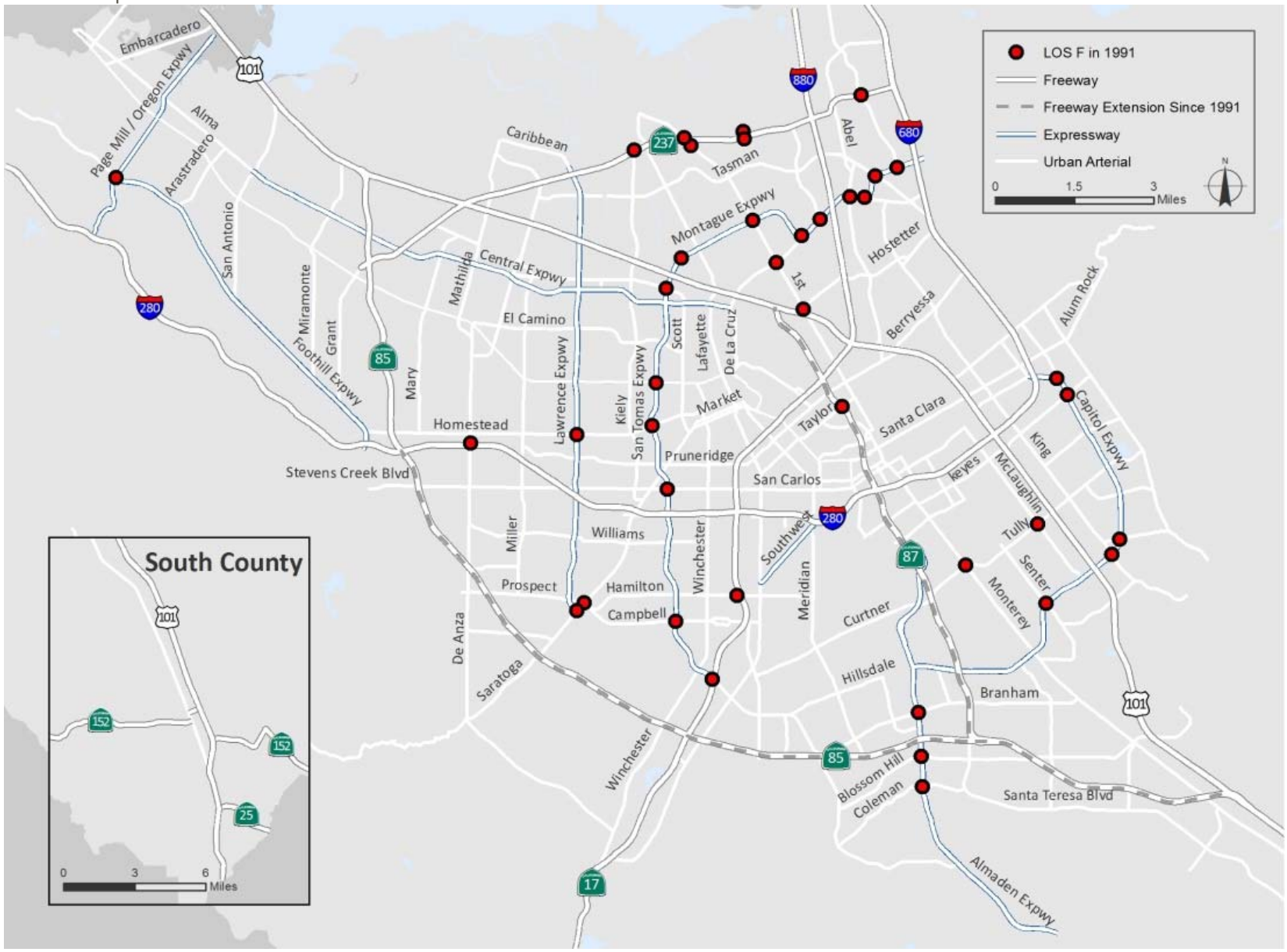


TABLE 3.2 | INTERSECTIONS OPERATING AT LOS F IN THE 1991 BASELINE PM PEAK PERIOD

ID	CMP System Roadway	Cross Street	Location	Jurisdiction
5802	Hwy 17 (SB)	Hamilton Av.	Campbell	State
3108	Hwy 17 (SB)	San Tomas Expwy./Camden Av.	Campbell	SC County
3101	San Tomas Exp.	Campbell Av.	Campbell	SC County
104	Hwy 280 NB Ramps	De Anza Blvd.	Cupertino	Cupertino
213	Calaveras Blvd. (Rte. 237)	Milpitas Blvd.	Milpitas	Milpitas
5720	Montague Exp.	Capitol Av.	Milpitas	SC County
5723	Montague Exp.	Milpitas Blvd.	Milpitas	SC County
5625	Montague Exp.	Main St./Old Oakland Rd.	Milpitas/San Jose	SC County
5801	Montague Exp.	McCarthy Blvd./O'Toole Av.	Milpitas/San Jose	SC County
5640	Montague Exp.	Trade Zone Blvd./McCandless	Milpitas/San Jose	SC County
3031	Page Mill/Oregon Exp.	Foothill Expwy.	Palo Alto	SC County
5405	Almaden Exp.	Blossom Hill Rd.	San Jose	SC County
5205	Almaden Exp.	Branham Ln.	San Jose	SC County
5408	Almaden Exp.	Coleman Rd.	San Jose	SC County
702	Brokaw Rd.	First St.	San Jose	San Jose
3026	Campbell Avenue	Saratoga Av.	San Jose	San Jose
5512	Capitol Exp.	Aborn Rd.	San Jose	SC County
5516	Capitol Exp.	Excalibur Dr. (Capitol Av.)	San Jose	SC County
5430	Capitol Exp.	Senter Rd.	San Jose	SC County
5432	Capitol Exp.	Silver Creek Rd.	San Jose	SC County
5513	Capitol Exp.	Story Rd.	San Jose	SC County
5803	Hwy 237	First St. (North)	San Jose	State
5804	Hwy 237	First St. (South)	San Jose	State
5805	Hwy 237	Great America Pkwy (N.)	San Jose	State
5807	Hwy 237	Great America Pkwy (South)	San Jose	State
5808	Hwy 237	Zanker Rd. (North)	San Jose	State
5809	Hwy 237	Zanker Rd. (South)	San Jose	State
5419	Lawrence Exp.	Saratoga Av.	San Jose	SC County
5732	Montague Exp.	First St.	San Jose	SC County
5734	Montague Exp.	Trimble Rd.	San Jose	SC County
3027	Monterey Hwy. (Rte. 82)	Curtner Av.	San Jose	San Jose

3028	Trimble Rd.	First St.	San Jose	San Jose
3030	Tully Rd.	McLaughlin Av.	San Jose	San Jose
5724	Montague Exp.	Mission College Blvd.	Santa Clara	SC County
3095	San Tomas Exp.	El Camino Real (Rte 82)	Santa Clara	SC County
3098	San Tomas Exp.	Homestead Rd.	Santa Clara	SC County
3090	San Tomas Exp.	Scott Blvd.	Santa Clara	SC County
3083	San Tomas Exp.	Stevens Creek Blvd.	Santa Clara/San Jose	SC County
5416	Lawrence Exp.	Homestead Rd.	Sunnyvale	SC County

CMP AUTO LEVEL OF SERVICE EVALUATION TECHNIQUES

In addition to adopting a Level of Service standard, the CMP statute requires that a uniform methodology be used to evaluate LOS on CMP System roadways. As part of the 1991 CMP development, the Technical Advisory Committee evaluated various LOS techniques and recommended that the Santa Clara County CMA use methodologies described in the 1985 Highway Capacity Manual (HCM) to evaluate LOS. The current VTA Traffic LOS Analysis Guidelines (2003) are based on the 2000 HCM.

The most recent edition of the HCM (2010) contains minor modifications to the methodologies for calculating automobile LOS on roadways, and also introduces new methodologies for evaluating level of service for non-auto modes including pedestrians, bicycles and transit. From 2011 to 2013, VTA staff engaged in an extensive program of testing, education and outreach on the new multimodal performance measures included in HCM 2010. Based on these activities as well as input from Member Agency staff, VTA staff concluded that the measures are not ready to be required for all CMP analysis, but could provide valuable information in certain cases, such as for development projects that propose changes to street geometry. For more information on HCM 2010 Multimodal Level of Service and other multimodal performance measures, see Chapter 4.

The CMP has two methods for monitoring the level of service of the CMP roadway network:

1. The CMP Monitoring and Conformance Report — A periodic study that collects level of service data on CMP roadways as well as land use approval data by Member Agencies.
2. Transportation Impact Analysis Requirement — The CMP requires cities and the County to prepare a Transportation Impact Analysis (TIA) that documents the impacts new developments would have on the CMP roadway network (as well as other parts of the transportation system) and the transportation improvements required to mitigate these impacts.

CMP LEVEL OF SERVICE METHODOLOGIES

The following section outlines specific auto LOS methodologies used in VTA's CMP. The Traffic LOS Analysis Guidelines of the CMP Technical Standards and Procedures include more technical information on auto LOS measurement.

Urban Arterials — The 2000 HCM intersection analysis operations methodology, which is based on Average Control Delay, is used to monitor auto LOS on urban arterials (this includes expressways and principal arterials).

Freeway Segments — Freeway segments are evaluated based on the procedures of the 2000 HCM. Beginning in June 2003, VTA adopted density as the standard for monitoring traffic conditions and traffic impacts due to new developments. Prior to 2003, the CMP used travel speed as the criteria for monitoring traffic conditions.

Rural Highways — Procedures described in Chapter 20 of the 2000 HCM are used to measure the percent time-spent following and average travel speed, with appropriate inputs for peak hour and peak 15 minute traffic volumes, the percentage split between the two directions of traffic, the percentage of trucks in the traffic flow, and the type of terrain.

CMP LOS CONFORMANCE EXCLUSIONS

The CMP legislation excludes certain types of traffic and situations from the determination of conformance with CMP traffic LOS standards (California Government Code Section 65089.4 (f), provided in Appendix J of this document). Exclusions can include traffic caused by interregional travel, construction, ramp metering, traffic signal coordination, and traffic generated by certain types of land use development. The VTA CMP Traffic Level of Service Analysis Guidelines contains complete information on how each of these exclusions is to be addressed in a TIA.

While the traffic problems caused by these situations are technically exempt under statute, local jurisdictions should try to develop solutions for congested roadway facilities to improve traffic conditions on the CMP System. VTA will assist Member Agencies in the effort. In addition, it is important to note that although these projects or situations are exempt from CMP standards, these exemptions do not necessarily apply to the CEQA process.

CMP ROADWAY NETWORK LEVEL OF SERVICE

The CMP Monitoring and Conformance Report summarizes the Level of Service for the CMP Roadway network. The 2016 CMP Monitoring and Conformance Report, the most recent edition released as of fall 2017, includes data from the baseline year (1991) through the year 2016. Auto

Level of Service data is presented for the three types of roadway facilities included in the CMP roadway network: arterial roadways (CMP intersection data), freeways, and rural highways.

A brief summary of the results from the 2016 report is provided below.

ARTERIAL ROADWAYS (CMP INTERSECTIONS)

Auto LOS data was most recently collected and evaluated by VTA and Member Agencies in the fall of 2016.The data collection for 2016 analyzed 242 of the 252 CMP intersections. Ten intersections were not analyzed due to ongoing construction activities during the data collection period. In 2016, there were six CMP intersections that operated below the CMP level of service standard. Five of these intersections, Page Mill Road/Oregon Expressway and Foothill Expressway, San Tomas Expressway and Campbell Avenue, Capitol Expressway and Aborn Avenue, Montague Expressway and Main Street/Old Oakland Road, and Montague Expressway at McCarthy Boulevard/O'Toole Avenue, are exempt from meeting CMP conformance requirements due to operating at LOS F under 1991 baseline conditions. One intersection, Central Expressway & De La Cruz Boulevard, has been operating at LOS F since 1996, prior to which it was operating at LOS E.

The non-exempt intersection of Foothill Expressway and El Monte Avenue was found to operate at LOS F for the first time since 2001 in 2014. However, in 2016 the LOS decreased to LOS E. The change in LOS may be in part due to changes in signal operations at the intersection. The County worked with VTA and the City of Los Altos to improve the LOS to an acceptable level while optimizing Expressway operations, and identify other offsetting measures.

Table 3.3 shows the percentage breakdown by level of service for all CMP intersections since 1991. The detailed listing of LOS levels at each CMP intersection is included in the 2016 Conformance and Monitoring Report.

TABLE 3.3 | CMP INTERSECTION LEVEL OF SERVICE BY PERCENTAGE, 1991 – 2016

LOS	1991	1992	1994	1996	1997	1998	2000	2001	2002	2004	2006	2008	2010	2012	2014	2016
A	4%	5%	4%	3%	1%	1%	1%	2%	0%	4%	3%	4%	4%	4%	4%	4%
B	19%	17%	18%	17%	19%	19%	18%	18%	19%	16%	15%	16%	15%	15%	15%	14%
C	13%	14%	23%	22%	22%	22%	24%	20%	21%	30%	30%	24%	30%	27%	28%	23%
D	27%	36%	37%	36%	31%	34%	34%	37%	40%	41%	41%	40%	38%	45%	38%	39%
E	19%	16%	14%	15%	18%	15%	12%	15%	14%	8%	10%	15%	12%	8%	12%	14%
F	17%	11%	4%	7%	9%	10%	10%	9%	6%	3%	2%	1%	1%	1%	3%	3%

FREEWAYS

Auto LOS data was most recently collected and evaluated in the fall of 2016. In 2016, 93 segments, with a combined length of 95 miles, operated at LOS F in the AM peak hour and 77 segments, with a combined length of 70 miles, operated at LOS F in the PM peak hour. In total, 177 out of 313 directional miles of freeway segments were found to be operating at LOS F in at least one of the peak periods. This is about 6 more lane-miles than the 2015 results.

Of these miles, 24 miles during the AM and 27 miles during the PM were at LOS F in the baseline 1991 year and therefore considered LOS-exempt. The remaining 71 directional miles during the AM and 67 directional miles during the PM are considered deficient.

Figures 3.4 and 3.5 show the auto LOS on the freeway system in 2016 for the AM and PM Peak Periods, respectively. The detailed listing of LOS levels for each freeway segment is included in the 2016 Conformance and Monitoring Report.

RURAL HIGHWAYS

Traffic counts were conducted at the 12 rural highway locations during the fall of 2016. All 12 rural highways operated at LOS E or better in 2016. Three locations recorded minor changes in LOS in 2016 compared to 2014: SR 35 north of SR 9 degraded from LOS B operations in 2014 to LOS C operations in 2016; SR 35 south of SR 9 degraded from LOS A operations in 2014 to LOS B operations in 2016; and Saratoga-Sunnyvale Road north of Big Basin degraded from LOS A operations in 2014 to LOS B operations in 2016. One rural highway, SR 152 west of Holsclaw, saw an improvement from LOS B in 2014 to LOS A in 2016. LOS conditions for all other segments remained the same. For further details on rural highway LOS, refer to the 2016 CMP Monitoring and Conformance Report.

COMPLIANCE AND CONFORMANCE

To be in conformance with the VTA Congestion Management Program, Member Agencies are required to monitor and submit a report on the level of service on CMP intersections within their jurisdiction biennially. Intersections LOS must be calculated using software and procedures that are compliant with CMP adopted standards. Beginning with the 2012 Monitoring cycle, VTA conducts the monitoring and LOS analysis for CMP intersections on behalf of the Member Agencies.

VTA is responsible for monitoring the performance of CMP intersections, freeways and rural highways. VTA must also determine consistency with the LOS standards for the entire CMP roadway network. If a roadway segment is not conforming to the LOS standards based on the monitoring process, the affected local jurisdiction will be notified, and may elect to remedy the LOS problem or prepare a Multimodal Improvement Plan.

FIGURE 3.4 | 2016 FREEWAY MIXED FLOW LEVEL OF SERVICE IN THE AM PEAK PERIOD

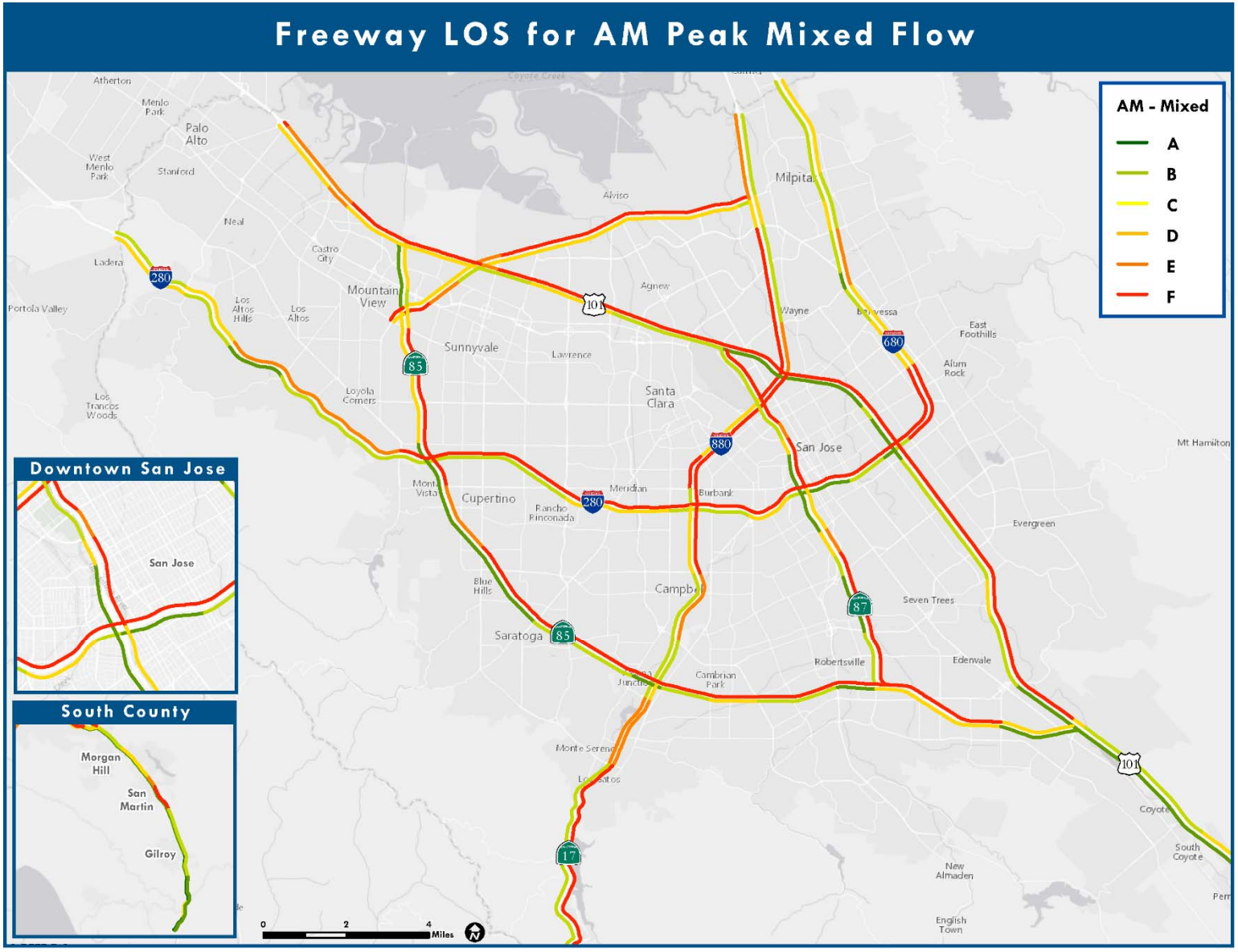
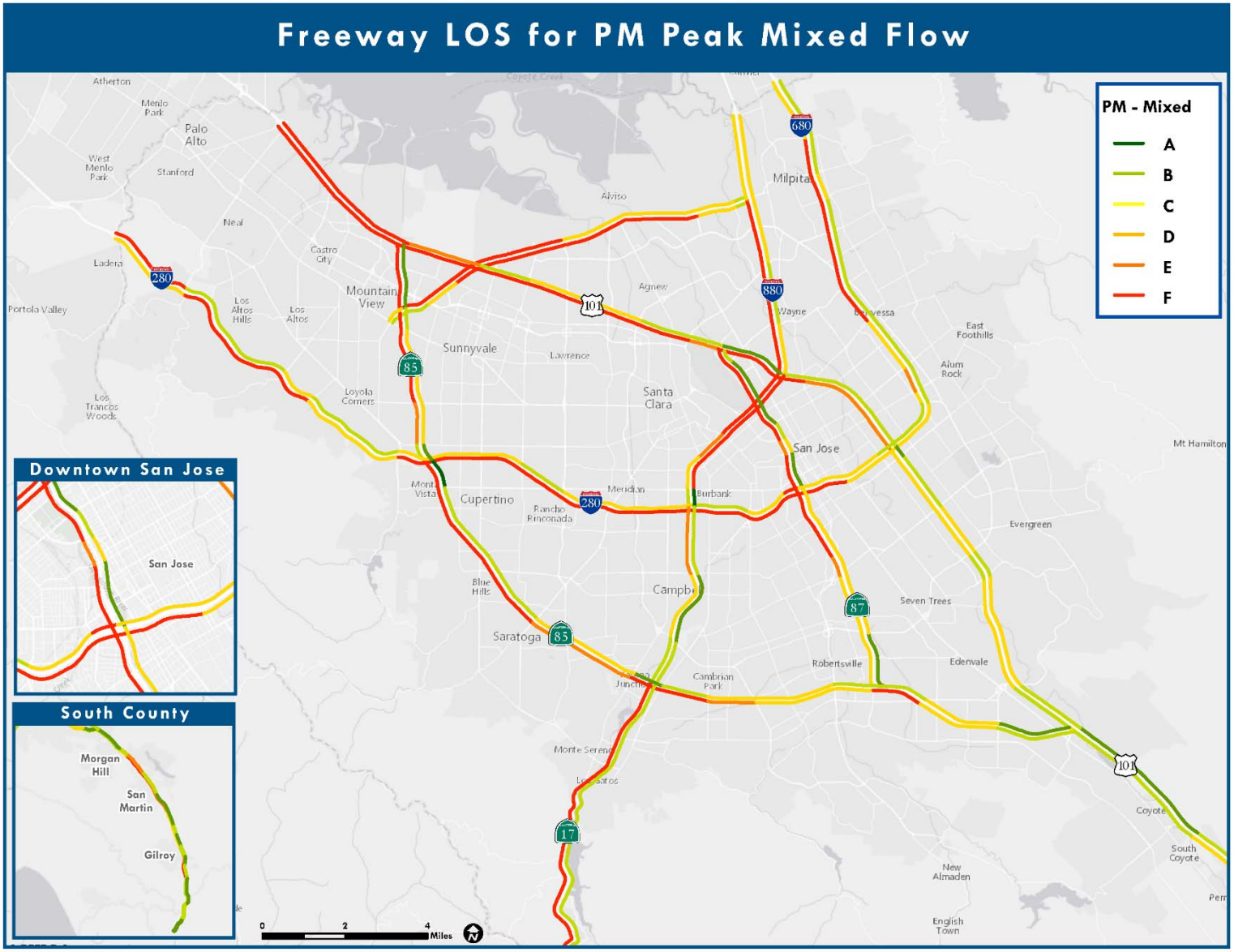


FIGURE 3.5 2016 | 2016 FREEWAY MIXED FLOW LEVEL OF SERVICE IN THE PM PEAK PERIOD



CHAPTER 4 | MULTIMODAL PERFORMANCE MEASURES ELEMENT

This chapter presents the CMP Multimodal Performance Measures Element. The CMP statute was amended in 1994 (Assembly Bill (AB) 1963, Katz: Chapter 1146, Stats 1994) to require that the CMP include multimodal transportation system performance measures.

This chapter is divided into the following sections:

- Background
- Development of Multimodal Performance Measures
- VTA CMP Multimodal Performance Measures
- Use of Multimodal Measures in CMP Elements
- Compliance and Conformance

BACKGROUND

How a problem is defined often leads to how it is solved; and how a problem is defined is frequently a function of its measurement. Transportation problems are traditionally defined in terms of congestion at specific locations (measured in terms of auto level of service—or LOS), and traffic solutions are typically developed to reduce congestion at these specific locations to improve auto LOS.

However, solutions that improve auto LOS may simply shift congestion to another location, not necessarily improving the operation of the overall transportation system. Therefore, while traffic delay on a single roadway may be reduced, overall travel times may not be significantly affected. Over-reliance on auto LOS as a measure of congestion can lead to ineffective choices in capital improvement programs or land use decisions, and can contribute to sprawl or have other unintended consequences. Similarly, solutions designed to improve auto LOS may adversely impact pedestrian and bicycle travel, for example by widening streets and crossing distances or by eliminating bike lanes at the intersection approach to provide a right-turn only lane. Focusing exclusively on auto LOS may also negatively impact transit, for instance by leading to intersection signal timing that heavily prioritizes automobile throughput at the expense of transit vehicle movement. These problems illustrate that Santa Clara County cannot build its way out of congested conditions. Instead, a balanced program of improvements beyond typical physical infrastructure – such as changes to land use development policies and pricing policies that discourage reliance on single-occupant vehicles – is needed to address transportation issues in the coming years.

The Multimodal Improvement Plan process (see Chapter 10) recognizes the inability of facility-based LOS evaluation to measure the performance of the overall transportation system and recognizes the need for implementing alternative actions in solving transportation problems. Performance measures are important tools in addressing transportation problems and developing alternative transportation solutions because they provide an indication of how well the transportation system serves the traveling public and contributes to economic development, environmental sustainability and quality of life. If multimodal transportation solutions are envisioned, then multimodal performance measures are essential analytic tools.

The 1994 amendment to the CMP statute (AB 1963) requires that the CMP include multimodal transportation system performance measures, and that these be used to develop the performance element described in Section 65089 of the statute, which was amended to include a multimodal performance measure. The Government Code Section 65089 (b) states:

> "The program shall contain the following elements:
>
> (2) A performance element that includes performance measures to evaluate current and future multimodal system performance for the movement of people and goods. At a minimum, these performance measures shall incorporate highway and roadway system performance, and measures established for the frequency and routing of public transit, and for the coordination of transit service provided by separate operators. These performance measures shall support mobility, air quality, land use, and economic objectives, and shall be used in the development of the capital improvement program required pursuant to paragraph (5), deficiency plans required pursuant to section 65089.4, and the land use analysis program required pursuant to paragraph (4). "

The VTA Board adopted the ten CMP Performance Measures as part of the 1995 CMP in compliance with AB 1963. The current CMP Performance Measures are summarized below, and technical documentation is provided in Appendix I.

In September 2013, the California legislature enacted Senate Bill (SB) 743, directing the Governor's Office of Planning and Research (OPR) to develop new significance criteria to replace level of service (LOS) in the evaluation of transportation impacts under CEQA. OPR has indicated that LOS will be replaced by Vehicle Miles Traveled (VMT). Further information about SB 743 and its implementation is provided in Chapter 3.

Although SB 743 did not directly call for changes to the Transportation Analysis Standards Element or Multimodal Performance Measures Element of the CMP, it is expected that these Elements will be updated for compatibility with the new CEQA Guidelines once they are adopted. Specifically, VTA will be revisiting the CMP auto LOS standard (see introduction to Chapter 2) and considering

providing further guidance for applying the performance measures described below, particularly VMT, for the analysis of the transportation impacts of land use and transportation projects. These efforts are expected to take place with the next update of the CMP in 2019.

DEVELOPMENT OF MULTIMODAL PERFORMANCE MEASURES

The development of appropriate performance measures is critical to demonstrate and compare the effects of alternative transportation plans or land use decisions. Performance measures provide a common framework in which to evaluate investments and strategies that might otherwise be difficult to compare. They allow an apples-to-apples comparison, illustrating tradeoffs between the alternatives as well as mitigation measures.

The purpose of multimodal performance measures is to evaluate how well Santa Clara County's transportation system serves the traveling public and contributes to economic development, environmental sustainability and quality of life. Individual performance measures may be applied to a specific geographic area or to a single mode type within the County. The results of these individual measures can be used to compare performance during a specific time period or under alternative investment strategies. However, because some measures will be more sensitive to changes that are specific to a particular type of improvement, mode or time, a comprehensive set of measures must be selected to capture the effects on the entire transportation system.

The key considerations when selecting performance measures are:

Suitability — Does the measure meet the goals and objectives of the plan or project they are evaluating?

After defining the suitability of the performance measure, it is important to determine if the following features are met:

Clarity — Is the measure understood by policy-makers, professionals, and the public?

Measurability — Is it possible to use available tools and resources to measure performance? What is the level of accuracy? Is the data reliable? Is the measure related to performance?

Forecastability — Can the performance measure be used to determine if alternatives are comparable? Can existing forecasting tools be used to measure performance?

Multimodality — Does the measure evaluate the travel modes being considered? Does it indicate meaningful tradeoffs between alternative modal investments?

Temporal Issues — Is the measure comparable over time? Is it capable of measuring the magnitude and location of temporal issues on travel demand? Can the measure differentiate between peak-period, off-peak, and daily travel demand?

Geography — Is the measure applicable to all areas of the County? Can it differentiate facility types? Can it be applied at a regional, subarea, corridor, or location specific level?

The first three criteria above: clarity, measurability, and forecastability are critical concepts that must be addressed across all performance measures. The remaining three criteria: multimodality, temporal issues and geography answer performance measure-specific questions; therefore, the degree these criteria are used will vary for each of the performance measures. As a result, some of the performance measures will be more sensitive to changes that relate to a particular type of improvement, mode choice, time of day, or place. To address each issue that affects the transportation system, a comprehensive set of performance measures must be selected.

VTA EVALUATION OF HCM 2010 MULTIMODAL LEVEL OF SERVICE MEASURES

In December 2010, the Transportation Research Board released the 2010 edition of the Highway Capacity Manual (HCM 2010). The HCM is a nationally-accepted resource that contains concepts, guidelines, and procedures for computing the capacity and quality of service of various roadway facilities, including freeways, arterial roads, signalized and unsignalized intersections, and rural highways. The 2010 edition of the HCM contains extensive new methodologies to evaluate level of service (LOS)/quality of service (QOS) for pedestrian, bicycle and transit modes on urban arterial roadways. One of the most significant elements introduced in HCM 2010 is a quality of service orientation in the methodologies, in which the evaluation is based on the perception of safety and/or comfort on the part of the pedestrian, bicyclist or transit rider, in addition to the capacity-based analysis methods presented in previous versions of the HCM.

VTA and Member Agency staff anticipated that the new multimodal LOS measures in HCM 2010 could be useful in evaluating the benefits and impacts of development proposals and roadway projects on pedestrians, bicyclists, and transit riders, as well as drivers. Therefore, to learn more about the multimodal LOS measures and consider potential applications in Santa Clara County, VTA and its Member Agencies engaged in an extensive program of education and testing from 2011-2013. These activities included pilot analyses of key intersections and corridors in the CMP network as well as studies to measure the magnitude of changes in multimodal LOS associated with hypothetical geometric modifications to roadway facilities. These activities were described in greater detail in the 2013 CMP and a Technical Memo prepared by VTA staff (March 2013). VTA staff continually updated the Systems Operations & Management (SOM) Working Group, the Land Use / Transportation Integration (LUTI) Working Group, and Advisory Committees as appropriate during this process, and organized two hands-on multimodal LOS training sessions for Member Agency staff.

The following is a summary of general observations on the HCM 2010 multimodal LOS measures by VTA and Member Agency staff based on the testing, education and outreach described above:

- Street modifications produce LOS changes in the direction (positive or negative) that generally aligns with the intuitive assumptions of VTA and Member Agency staff, with occasional anomalies.
- The magnitude of MMLOS changes are not as predictable as the direction, and require further evaluation.
- Proper application of HCM 2010 multimodal LOS methodologies may require consistent judgment calls and/or the development of guidelines for interpreting certain variables of street geometry.
- HCM 2010 formulas may need to be customized to adjust or disregard certain variables to bring multimodal LOS evaluations more in line with VTA and Member Agency assumptions (for example, results related to right turn islands and road diets). HCM 2010 explicitly states that formulas can be adjusted to reflect local conditions.

Based on the observations noted above, VTA identified the following next steps:

- The potential establishment of HCM 2010 multimodal LOS thresholds in the VTA CMP is not likely in the near term unless new industry standards for implementation and/or revised multimodal LOS formulas are released.
- The 2014 VTA Transportation Impact Analysis (TIA) Guidelines update included a new requirement for projects that modify roadway or intersection geometry to include an informational quality of service (QOS) evaluation of bicycle and pedestrian modes on the modified facility. The TIA Guidelines allow the Lead Agency latitude in selecting the QOS methodology but include the HCM 2010 Multimodal LOS measures as one option recommended for consideration. See Chapter 6 for more details on the 2014 TIA Guidelines update.
- VTA will continue to test and evaluate multimodal evaluation measures used in the Bay Area and elsewhere.

VTA CMP MULTIMODAL PERFORMANCE MEASURES

The 1995 CMP identified nine performance measures intended to meet specific statutory requirements unique to the CMP legislation. Through subsequent planning efforts, the performance measures have continued to evolve to meet the CMP statutory requirements while taking a more sensitive, effective, and efficient approach to measuring performance. In 2006 and 2007, VTA developed the Transit Sustainability Policy which identifies performance measures and thresholds for transit. The Policy ensures that investments in transit service are used efficiently

and serve the corridors with the greatest transit demand. In 2014, the VTA TIA Guidelines were updated to include Pedestrian/Bicycle Quality of Service analysis for certain projects, and Transit Vehicle Delay analysis (due to automobile congestion) for all projects.

This section describes the twelve CMP multimodal transportation system performance measures currently in use. These measures are summarized in Tables 4.1 and 4.2, and a more detailed discussion of each measure is provided below. A technical discussion of the measures and their application can be found in Appendix I.

AUTO LEVEL OF SERVICE

The Highway Capacity Manual defines Level of Service (LOS) as "…qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers." The terms used in describing auto LOS include speed and travel time, freedom to maneuver, comfort/convenience, and traffic interruptions. Auto LOS is categorized from A through F; with LOS A representing free-flow travel and LOS F representing congested traffic flow at specific intersections or along roadway segments. Chapter 2 of this document summarizes the VTA CMP auto LOS standards and describes which facilities are considered to be deficient according to these standards.

Auto LOS is a vehicle-based performance measure that is used to measure imbalances between traffic volume (demand) and capacity (supply) in specific locations on the roadway system. Adding lanes, modifying intersections, increasing transit infrastructure on parallel routes, and using ITS strategies such as signal synchronization, are some of the strategies to increase capacity and improve operations and through-put of roadway facilities. Changes in volume can be caused by intensification of development, mode shifts, time of day shifts, or changes in travel patterns (i.e. changing origins or destinations).

Auto LOS is a widely accepted measure of roadway and intersection performance. Auto LOS alone is a good indicator of trouble spots in the road network. When used in conjunction with other performance measures such as passenger throughput, auto LOS can be a much more meaningful performance measure. Nevertheless, auto LOS has significant shortcomings. An example of this is that a singular focus on traffic auto LOS may encourage the belief that a significant increase in roadway, intersection or interchange capacity is the most effective mitigation measure for traffic impacts. Using other performance measures in addition to auto LOS can help decision makers see the benefits of a wider range of improvements that encourage multimodal uses.

TABLE 4.1 | SUMMARY OF VTA 2017 CMP MULTIMODAL PERFORMANCE MEASURES

Performance Measure	Mode(s) Analyzed	Brief Definition	Metric Improves If…
Auto Level of Service (LOS)	Auto	A measure of vehicle delay and traffic flow at intersections and along roadway segments	Congestion and delay decrease and traffic flows more smoothly at specific intersections or roadway segments.
Vehicle Miles Traveled (Per Capita, Employee or Person-Trip)	Auto	A measure of the total amount of auto travel (trips multiplied by average trip length), associated with a specific site or within a defined area	The total amount of auto travel to/from a specific site or within a defined area decreases, or grows more slowly than the number of residents or employees or the amount of travel by non-auto modes.
Modal Split	All Modes	The percentage of travelers using the major transportation modes (e.g. drive-alone auto, HOV, transit, pedestrian and bicycle)	The total number of trips by transit, pedestrian, bicycle, and HOV modes increases faster than the total number of auto trips to/from a specific site or within a defined area.
Pedestrian and Bicycle Quality of Service (QOS)	Pedestrian and Bicycle	A measure of features of the environment that affect the comfort and safety of pedestrians and bicyclists from the user's perspective.	Physical modifications to intersections or roadway segments provide a greater level of comfort and safety for pedestrians and bicyclists.
Transit Vehicle Delay	Transit	A measure of delay experienced by transit vehicles, associated with overall automobile congestion at specific intersections or along a transportation corridor	Transit vehicles experience reduced delay at an intersection or along a corridor, either through an overall decrease in congestion or through the implementation of transit priority measures.
Transit Accessibility	Transit	An aggregate index of transit frequency, accessibility and coordination to determine how well transit serves the population of Santa Clara County	Transit frequency, accessibility and/or coordination improve.
Air Quality	N/A	Countywide measures of specific pollutants emitted by mobile sources (e.g. autos, trucks and transit vehicles)	Travel patterns reflect lower overall vehicle miles traveled (see above), and/or changes to travel speeds, frequency of starting/stopping, or other factors reduce air pollutants.
Duration of Congestion	Auto	The length of time that a transportation facility is congested	The duration of congestion on a transportation facility decreases.
Hours of Delay/Person-Trip	Auto or Transit	The total amount of delay experienced by users of a transportation facility, divided by the total number of person-trips on the facility.	Transportation facility improvements result in reduced delay or the use of more efficient travel modes increases while delay stays the same.
Travel Time Index	Any mode, most often Auto or Transit	The amount of time to travel between two points by a particular mode, or the average across all modes	Travel time between two points by a particular mode or across all modes decreases.
Transit Sustainability Policy (TSP)	Transit	Ridership and revenue targets for VTA transit service	Average Boardings per Revenue Hour and Average Daily Boardings per Station increase to meet/exceed the target ranges identified in the TSP for each type of transit
Travel Pattern (in Person Trips)	All Modes	The total amount of directional travel between given geographic areas, such as Traffic Analysis Zones (TAZs), cities, or counties	N/A

TABLE 4.2 | APPLICABILITY OF VTA 2017 CMP MULTIMODAL PERFORMANCE MEASURES

Performance Measure	Member Agencies		VTA/Member Agencies	VTA		
	Evaluation of Development Projects	**Evaluation of Long-Range Planning Efforts**	**Evaluation of Transportation Capital Projects**	**Countywide Transportation Plan**	**Monitoring & Conformance**	**Transit Service & Operations Planning**
Auto Level of Service (LOS)	*Required* per CMP Transportation Analysis Standards	*Required* per CMP Transportation Analysis Standards	*Required* per CMP Transportation Analysis Standards	*Required* per CMP Transportation Analysis Standards	*Required* per CMP Transportation Analysis Standards	N/A
Vehicle Miles Traveled (Per Capita, Employee or Person-Trip)	*Recommended* for consistency with recent state legislation	*Recommended* for consistency with recent state legislation	*Recommended* for consistency with recent state legislation	*Included;* Anticipated updates in response to state legislation	Under evaluation for future reporting with Big Data (See Ch. 8)	N/A
Modal Split	*Recommended*	*Recommended*	*Recommended*	*Included*	N/A	N/A
Pedestrian and Bicycle Quality of Service (QOS)	*Required* for per CMP TIA Guidelines changes to roadway geometry or signal operations; *Recommended* for other projects	*Recommended*	*Recommended*	N/A	Key CMP facilities evaluated in pilot studies (2011-2013)	N/A
Transit Vehicle Delay	*Required* per the CMP TIA Guidelines	*Recommended*	*Recommended*	N/A	N/A	N/A
Transit Accessibility	N/A	*Recommended*	*Recommended* for projects changing frequency, accessibility or coordination of transit routes/facilities	*Included*	N/A	*Included*
Air Quality	*Recommended;* Often required in CEQA evaluation	*Recommended;* Often required in CEQA evaluation	*Recommended;* Often required in CEQA evaluation	*Included*	N/A	N/A
Duration of Congestion	N/A	*Recommended*	*Recommended*	*Included*	Under evaluation for future reporting with Big Data (See Ch. 8)	N/A
Hours of Delay/Person-Trip	N/A	*Recommended*	*Recommended*	*Included*	N/A	N/A
Travel Time Index	N/A	*Recommended*	*Recommended*	*Included*	Under evaluation for future reporting with Big Data (See Ch. 8)	N/A
Transit Performance Monitoring	N/A	N/A	*Under Development*	N/A	N/A	*Under Development*
Travel Pattern (in Person Trips)	N/A	N/A	N/A	*Included*	N/A	N/A

VEHICLE MILES TRAVELED

Vehicle Miles Traveled (VMT) is a measure of the total amount of vehicle travel on the roadway network. VMT is calculated by multiplying the total number of vehicle trips by the average distance of each trip. VMT can be normalized to reflect travel efficiency, such as measuring VMT per capita, employee or person-trip. Normalization is an important step to understand the meaning of a given change in VMT. For example, an absolute increase in VMT could indicate a greater number of single-occupant vehicle trips, or an increase in trip lengths; however, if the rise in VMT is slower than the rise in population (showing an overall decrease in VMT/capita), it would indicate that the usage of the transportation network is becoming more efficient over time.

VMT (per capita, employee or person-trip) is therefore a compound performance measure encompassing auto trip generation, average auto trip length, and modal split. This makes it a good indication of the overall efficiency of the multimodal transportation network, but not an ideal tool to identify specific problems in specific locations within the network. An improvement (e.g., a decrease) in VMT per capita, employee or person-trip could be an indication of any combination of the following:

- The total number of auto trips decreases;
- The average length of auto trips decreases;
- Usage of non-auto travel modes, such as transit, bicycle, pedestrian and high-occupancy vehicle (HOV) increases while auto usage stays the same or decreases.

The effects described above could be caused by:

- A more efficient land use pattern, bringing residences, work sites and retail/services in closer proximity to each other (improving accessibility), leading to shorter auto trips and/or a greater share of trips by walking, bicycling and transit;
- Improvements to transportation infrastructure to make transit, bicycle and pedestrian travel faster, safer, and more attractive relative to auto travel;
- Transportation Demand Management (TDM) programs to incentivize other travel modes and reduce auto trips (see Chapter 4).

Conversely, an increase in VMT per capita, employee or person trip could be an indication that the total amount of auto travel is increasing and/or travel by transit, bicycle, pedestrian and HOV modes is decreasing, or not increasing as fast as auto travel. These effects could be caused by an inefficient land use pattern, a degradation of non-auto transportation infrastructure or a significant enhancement to auto infrastructure without equivalent investments in non-auto modes, a reduction in TDM incentives to residents or employees in an area, or any combination of these factors.

During the development of the 1995 CMP, the CMA Board selected VMT per Person-Trip (VMT/P-T) as one of the CMP Multimodal Performance Measures. With the passage of SB 743, VMT measures will take on greater prominence in transportation analyses for CEQA as well as CMP purposes (see intro sections to this chapter and Chapter 2). As such, VTA will revisit this performance measure to consider updates for future versions of the CMP.

MODAL SPLIT

Modal Split shows the percentage of travelers using the major transportation modes (e.g., drive-alone auto, HOV, transit, pedestrian and bicycle). Modal Split can be used in making programming decisions such as determining the trade-offs between highway, HOV, and transit improvements or it can be used to answer policy related questions such as measuring the effectiveness of increasing parking costs in a downtown area to encourage transit ridership. Some recent major development projects and long-term land use plans in Santa Clara County have set modal split targets, such as Apple Park in Cupertino, San Jose's Envision 2040, and the North Bayshore Precise Plan in Mountain View.

Modal Split is useful in identifying transportation capital projects, TDM strategies and long-term land use planning alternatives that provide the greatest increases in transit, bicycle and pedestrian activity, relative to automobile usage. It is also useful in measuring long-term trends in the usage of various transportation modes in a specific area, within a city or countywide.

PEDESTRIAN AND BICYCLE QUALITY OF SERVICE

As part of the 2014 update of the VTA TIA Guidelines, VTA established a requirement for projects proposing changes to existing roadway or intersection geometry or changes to signal operations to include a Quality of Service (QOS) analysis for bicyclists and pedestrians. A QOS analysis is also recommended for other projects and for documenting existing conditions. QOS methodologies typically measure features of the environment that affect the comfort and safety of bicyclists and pedestrians from the user's perspective, such as the presence and width of sidewalks and bicycle lanes, intersection crossing distance and delay, lateral separation from auto traffic, auto volumes, and the presence of landscaping or trees. These considerations are in contrast to capacity-based methodologies for evaluating pedestrian and bicycle conditions in the previous TIA Guidelines. The updated TIA Guidelines recommend a capacity-based analysis only for large or unique projects generating large volumes of pedestrian and/or bicycle trips.

The 2014 VTA TIA Guidelines provide informational summaries of six QOS methodologies, including the multimodal LOS approach presented in the Highway Capacity Manual (HCM) 2010 (see "VTA Evaluation of HCM 2010 Multimodal Level of Service," above, for further information). Lead Agencies have discretion to select appropriate methodologies for bicycle and pedestrian QOS analysis.

TRANSIT ACCESSIBILITY

For the purpose of the VTA CMP, one measure of transit service performance is the local Transit Accessibility Index, which disaggregates transit performance by geographic zone. In contrast to the traditional mobility-based approach for the measurement of transit service performance, accessibility provides a place-based approach for understanding how transit service is divided between areas in Santa Clara County.

The Transit Accessibility Index indicates how well transit serves the population of Santa Clara County. This measure shows where changes in transit service parameters (such as headway and frequency) are desirable and highlights areas where the addition or modification of transit routes and stops may be beneficial. The accessibility index is a sophisticated tool for measuring the effects of changing land uses and densities by striking a balance between zonal travel and household and employment figures. Because it is tied to Traffic Analysis Zones (TAZ), the index can be used to quickly analyze and incorporate both travel demand and demographic data into any accessibility analysis.

The index is derived from travel demand model data, so its outputs are fully in line with the travel model estimations and assumptions used in VTA's transportation demand model. Furthermore, this method of evaluating transit accessibility encourages a systems approach to accessibility analysis through the combined estimation of multiple transit operator performance. Transit Accessibility was used as one of the performance measures during VTA's Next Network transit service redesign effort in 2016 and 2017 in preparation for the opening of the BART Phase 1 extension to the Milpitas and Berryessa Stations.

AIR QUALITY

Vehicle emissions of air pollutants are measured in tons of pollutants and are related to several factors. These factors include vehicle miles traveled, cold and hot starts and stops, speed changes, and idling time. The air quality performance measure is necessary for conformance with state CMP guidelines for air quality impacts, and is often required in CEQA evaluation.

Air Quality is measured countywide by pollutant type during the A.M. and P.M. peak hours using the VTA transportation model and Direct Travel Impact Model 3.1 (DTIM 3.1) designed by Caltrans. The pollutants measured include Carbon Monoxide (CO), Hydrocarbons (HC), Oxides of Nitrogen (NOx), and Particulate Matter (PM).

Air Quality is a good measure of the overall external impacts of transportation system operation, but it does not directly correlate to the benefits of an efficient multimodal transportation system. While increased traffic speed and a reduction in the amount of stopping

and starting reduce most emissions, oxides of nitrogen tend to increase as travel speeds increase. In addition, reductions in air pollution have been achieved in recent years by modifying the composition of gasoline, improving the overall fuel economy of the vehicle fleet on the road, and taking measures to reduce pollution of stationary sources (e.g. power plants, factories, etc). Therefore, it is difficult to know whether improvements in Air Quality are due to efficient modal use or other factors.

Other performance measures related to Air Quality can be used to assess related environmental impacts. For example, energy and fuel consumption can measure the amount of energy required to perpetuate or operate an individual project or the transportation system in an area. For automobiles and buses, fuel or diesel fuel consumption can be a measure, and for light and heavy rail transit, electricity consumption can be used. VTA is proactively seeking opportunities to incorporate energy and air quality improvements into all aspects of VTA operations (See "VTA Activities Related to Energy and Air Quality," Chapter 6).

DURATION OF CONGESTION

Duration of Congestion measures the length of time that particular transportation facilities are subject to congested conditions. When travel demand begins to exceed capacity, travelers have four possible ways to avoid the congestion:

1. Shift modes
2. Choose not to travel (e.g. telecommute)
3. Take alternative routes
4. Travel at less congested times

The first three options will not directly affect the Duration of Congestion; however, if travelers choose to shift travel to less congested times, the duration of congestion will increase over a longer period. This is sometimes referred to as "peak spreading."

Duration of Congestion is an auto-oriented performance measure typically used on highway segments and arterial streets. Duration of Congestion can be affected by changes in travel demand (such as congestion pricing, land-use policies that result in shorter trip patterns, and mode shifts) or changes in transportation capacity (adding highway lanes, modifying intersections, increasing transit infrastructure, and using ITS strategies).

HOURS OF DELAY PER PERSON-TRIP

This measure identifies the system-wide hours of delay travelers experience due to congestion on the transportation system. It is generally measured for private vehicle users including SOV and HOV, but can also be used to measure delay experienced by users of transit or other modes. Delay is generally determined by comparing travel time on the transportation facilities

during peak/congested conditions with off-peak/uncongested conditions. Dividing delay by person-trips accounts for the changes associated with population and job growth.

Delay tends to be more sensitive to mitigation efforts than auto LOS. For example, consider an intersection that is currently operating at LOS F with an average control delay of 100 seconds. An action (or group of actions) could improve the delay to 85 seconds, but LOS would remain LOS F.

Hours of Delay/Person Trip is a good supporting performance measure for freeway/expressway ramp and intersection improvements since most of the delays occur in queuing and stop-and-go situations. Hours of delay can be a good indicator of the effectiveness of adding roadway and transit capacity to a travel market or system-wide. It is also a good indicator for system management projects such as ramp metering and signal timing.

TRAVEL TIME AND TRAVEL TIME INDEX

Travel Time is measured for the selected travel markets for a base year and some future year. For autos, the difference in Travel Time indicates the change in congestion over time. For Transit, the different in Travel Time may reflect differences in congestion or changes to the amount of priority received by transit vehicles. Travel Time can be a more intuitive measure of mobility than delay because the traveling public thinks more about how long a trip takes than how long they have to wait in traffic at specific locations.

The Travel Time Index reports the travel time by a particular mode or the average travel time across modes. The index compares Travel Time over different years, between different alternatives, and between different modes. The strength of this measure is its ability to show the differences in point to point travel time by mode. Therefore, it is an effective measure to use for transit projects as well as roadway improvements.

TRANSIT PERFORMANCE MONITORING

VTA Staff is developing a new framework for evaluating bus route performance that accounts for the ridership and coverage goals of public transit. Under this framework, ridership-purposed routes would be judged by productivity and cost metrics and would not be subject to goals based on service class averages. Coverage-purposed routes would not be evaluated strictly on productivity but rather whether the ridership recorded and social good achieved by these routes justifies the opportunity cost of the service. Since there are more needs for transit than VTA can afford to operate, staff will work to ensure that each route represents the best use of public funds, given Board direction on the ridership/coverage balance.

The forthcoming performance evaluation framework will be enforced by a new Transit Performance Monitoring Program that will function like an ongoing comprehensive operations analysis. Every quarter, VTA staff will present system-wide and route-specific performance data to the Board of Directors. A handful of routes will be selected for a thorough analysis and development of service changes designed to improve performance. These proposals may include routing adjustments, changing the frequency of service, changing the span of service or discontinuance. These service changes, along with community input and other Board direction, will inform the development of VTA's annual transit service plans.

The future performance monitoring policy and monitoring program will be brought to VTA's Board of Directors in early 2018.

TRAVEL PATTERN (IN PERSON TRIPS)

Travel Pattern measures the balance between people and activities such as employment, recreation, and shopping. It is evaluated in terms of person trips, which provides a measure of mobility; increasing person trips indicates increased mobility. The Bay Area and Santa Clara County are divided into several subareas; travel patterns are used to capture the travel demand and growth projection, in terms of person movements, among these subareas.

USE OF MULTIMODAL MEASURES IN CMP ELEMENTS

The CMP statute requires that the multimodal transportation system performance measures be used to prepare the CMP Capital Improvement Program (CIP), the Land Use Impact Analysis Program, and Multimodal Improvement Plans. At this point, the multimodal transportation performance measures are not used to determine Member Agency conformance with the CMP, except for auto LOS (see Chapter 2). Additionally, Member Agencies are not currently required to use most of the performance measures in their evaluation of land-use development proposals, general plans/general plan amendments, or specific plans. The 2014 VTA TIA Guidelines Update included a requirement for Pedestrian/Bicycle Quality of Service analysis for certain projects and Transit Vehicle Delay analysis for all projects. However, other multimodal performance measures may be useful in implementing alternative mitigation measures associated with creating pedestrian and transit-friendly development patterns as promoted in VTA's Community Design and Transportation (CDT) Program, and as pursued by Member Agencies in meeting their own development goals.

VTA plans to use the multimodal performance measures described in this chapter in the identification of the capital projects for the Countywide Transportation Plan and Capital Improvement Program, and in the Land Use Analysis Program and Multimodal Improvement Planning. In addition, VTA uses the measures and approach in the TSP to evaluate existing and proposed transit service and improve transit service productivity. In cases where capital investments in transit routes have already been made, it is the policy of VTA to increase

ridership on these lines by working with cities to improve surrounding land uses and develop supporting policies.

The following is a summary of the applicability of these measures to each of these programs:

Countywide Transportation Plan — VTA uses the CMP multimodal performance measures in the development of its long-range countywide transportation plan for Santa Clara County, Valley Transportation Plan. VTP includes an analysis of two scenarios (a) a baseline year, and (b) baseline plus the program of projects outlined in the plan. These performance measures are used to evaluate the systemwide effects of the two alternatives. A similar analysis will be calculated for VTA's future long-range countywide transportation plans.

Land Use Analysis Program — Certain of these multimodal performance measures will serve to evaluate the effects of land use changes on the CMP Transportation System. Each year, land use data is collected and the countywide land use database is updated. The countywide transportation model can be used to calculate the performance measures under current conditions and compare them with previous land use conditions. This comparison will be particularly useful as data is collected over the long term.

Multimodal Improvement Plans — These performance measures may be used to evaluate the alternative packages of improvements and actions considered for Multimodal Improvement Plans. While state law requires the application of performance measures to local Multimodal Improvement Plans, these particular measures may not be meaningful when applied to small geographic areas. Therefore, for deficiencies that occur on principal arterials located on the CMP System, the jurisdiction in which the deficiency occurs will be responsible for preparing a Multimodal Improvement Plan, which includes level of service as a performance measure and may propose other performance measures. The proposed performance measures must be approved by the VTA Board before the Multimodal Improvement Plan can be approved.

COMPLIANCE AND CONFORMANCE

VTA is responsible for collecting transportation performance measurement data for use in the countywide transportation plan, land use analysis, Multimodal Improvement Plans, and the CIP. Member Agencies are responsible for analyzing multimodal performance measures as required per the CMP and associated Technical Guidelines (see Table 4.2).

CHAPTER 5 | TRANSPORTATION DEMAND MANAGEMENT AND TRIP REDUCTION ELEMENT

This chapter describes the Congestion Management Program (CMP) Transportation Demand Management Element. Throughout this chapter, the term Transportation Demand Management (TDM) will be used to refer to the series of programs that are included in the Travel Demand Management Element.

The chapter is divided into the following sections:

- A Definition of Transportation Demand Management
- TDM, Automobile Trip Reduction, and VTA Guidelines
- TDM and Legislation
- Categories of TDM Strategies
- TDM Programs that VTA Implements
- Funding for TDM Programs
- Compliance and Conformance

A DEFINITION OF TRANSPORTATION DEMAND MANAGEMENT

"Transportation Demand Management or TDM refers to various strategies that change travel behavior (how, when and where people travel) in order to increase transport system efficiency and achieve specific planning objectives."[1]

Transportation Demand Management programs range from simple marketing efforts, such as promoting ridesharing, to more complex public policies, such as developing site-design guidelines or parking pricing programs. These programs are designed to improve the overall performance of the CMP System through elimination or shortening of auto trips, mode shifting, time shifting, or trip linking. To be successful, TDM programs must not only encourage ridesharing, transit, cycling, and walking, but also provide attractive alternatives to single-occupant vehicle trips.

TDM, AUTOMOBILE TRIP REDUCTION, AND VTA GUIDELINES

TDM programs play an important role in reducing automobile trips generated by new development. The goals of TDM strategies can vary from eliminating or shortening auto trips

[1] Online TDM Encyclopedia, Victoria Transportation Policy Institute, accessed July, 2013.

(e.g. telecommuting, trip linking, improving accessibility to services), shifting trips from single-occupancy-vehicle to other modes (carpool, transit, walking, bicycling), or shifting trips away from the most congested routes and times of the day. All of these strategies, when successful, reduce the total number of automobile trips on congested facilities during rush hour. This can have important benefits for the transportation system, and can also provide incentives to developments by reducing the extent of transportation impacts found in their environmental review and Transportation Impact Analysis (TIA) processes. Some recent developments in Santa Clara County have applied aggressive trip reduction targets of 30% or more as part of their TDM programs, including annual monitoring and enforcement.

In response to this trend, VTA updated the CMP TIA Guidelines (October 2014) with automobile trip reduction as one of the primary focus areas. A TIA report is required for all development projects in the County that generate 100 or more net new automobile trips during either peak period. As such, the way that transportation impacts and mitigation measures are analyzed and reported in TIAs makes a meaningful difference in how congestion is addressed by major projects. See "Development Review Program," Chapter 7, for further discussion about the TIA Guidelines and relationship to VTA Development Review.

Prior to the 2014 TIA Guidelines Update, the TIA Guidelines listed a table of standard trip reductions for various project features, including a 5% reduction for TDM programs including financial incentives. The TIA Guidelines also noted that some projects could take larger trip reductions, but did not lay out a specific process for this to be achieved. In response to inquiries from Member Agencies and others, VTA retained the Standard Trip Reductions table but included two additional approaches to taking auto trip reductions in a TIA:

- ***Target-Based Reductions*** may be taken when the project applicant has entered into an enforceable agreement with the Lead Agency that limits the number of automobile trips traveling to and from the project site. The trip reduction program must include a commitment to monitor trip generation and determine whether targets are met, an enforcement structure, and a commitment to summary-level data sharing;
- ***Peer/Study-Based Trip Reductions*** may be taken when studies of similar projects, or of other sites occupied by the project applicant, have demonstrated comparable trip reductions through survey results or other data. The trip reduction program must include a commitment to monitor trip generation, and a commitment to summary-level data sharing.

The 2014 TIA Guidelines also include a requirement for projects to complete an Auto Trip Reduction Statement (ATRS) in the Executive Summary of a TIA Report. The ATRS is intended to provide a concise summary of all automobile trip reduction efforts, including any reductions claimed in the Trip Generation section of the TIA and any additional trip reduction efforts undertaken to mitigate or lessen project impacts.

Over the coming years, VTA intends to work with Member Agencies to gather data on TDM and Trip Reduction efforts by major projects utilizing the "Target-Based" and "Peer/Study-Based" approaches to auto trip reductions in TIAs. This data will be used to create a "TDM Clearinghouse" of data for Member Agencies and others to analyze the usage and effectiveness of various TDM strategies in Santa Clara County.

VTA also envisions taking on a more prominent role in coordinating TDM strategies across multiple jurisdictions in high-growth areas of the county, such as taking an active role in the formation of Transportation Management Associations (TMAs). VTA will work proactively with Member Agencies to identify such opportunities to help establish TDM programs or strengthen existing TDM programs.

TDM AND LEGISLATION

California Government Code section 65089(b)(3) requires that the CMP contain a Travel Demand Element that promotes alternative transportation methods and improves the balance between jobs and housing. TDM strategies are a crucial part of meeting the requirements of the California Clean Air Act (CCAA). The TDM Element of the VTA CMP is designed to conform to the requirements of the State CMP statute, and the Federal and California Clean Air Acts.

The CMP statute states in Government code section 65089 (b)(3) that the CMP should contain the following element:

"A travel demand element that promotes alternative transportation methods, including, but not limited to, carpools, vanpools, transit, bicycles, and park-and-ride lots; improvements in the balance between jobs and housing; and other strategies, including, but not limited to, flexible work hours, telecommuting, and parking management programs. The agency shall consider parking cash-out programs and congestion pricing during the development and update of the travel demand element."

The CMP statute also requires that the CMP be responsive to the California Clean Air Act (CCAA) and the requirements of the regional Clean Air Plan. Specifically, the CMP must consider the potential effect of regional air quality measures in the Trip Reduction and Transportation Demand Element, the Capital Improvement Program, and the Multimodal Improvement Plan Element. Appendix F provides a summary of references to air quality included in the CMP statute.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) TRIP REDUCTION REQUIREMENTS

The Bay Area Air Quality Management District (BAAQMD), also referred to as the Air District, recommends programs to reduce solo commuting such as guaranteed ride home programs, shuttles to transit, ride-matching for carpools and vanpools, subsidy programs for transit passes, parking charges, and effective advertising and marketing programs.

In Fall 2012, California Senate Bill 1339 was signed into law authorizing the Air District and MTC to jointly adopt a regional commute benefit program. Pursuant to SB 1339, the Air District and MTC developed the Bay Area Commuter Benefits Program (Program) to promote the use of alternative commute modes such as transit, ridesharing, biking and walking. The Program requires employers with 50 or more full-time employees in the Bay Area to offer commute benefits to employees who work 20 hours or more per week. Employers can meet the requirement by offering any of the following benefits:

- Allow employees to pay for transit, vanpool or bicycle expenses with pre-tax dollars
- Directly subsidize transit or vanpool costs up to $75 per month
- Provide employer-operated transit, shuttle or vanpool services
- Provide an alternative benefit that would be equally effective in reducing auto trips

TRANSPORTATION REQUIREMENTS OF THE CALIFORNIA CLEAN AIR ACT (CCAA)

The CCAA of 1988 expanded the scope and accelerated the pace of air pollution control efforts in California. The intent of the Act was to establish a planning process that would result in attainment of the State's health-based ambient air quality standards at the earliest practicable date.

Each Air District is required to adopt a Clean Air Plan (CAP) that contains a strategy for attaining air quality standards. The Bay Area's Air District's first CAP was adopted in October 1991. In April 2017, the Air District Board adopted the Bay Area 2017 CAP. The 2017 CAP serves to update the Bay Area ozone plan in compliance with the requirements of the California Health & Safety Code. In addition, the 2017 CAP provides an integrated, multi-pollutant strategy to improve air quality, protect public health, and protect the climate. The 2017 CAP will reduce ozone pre-cursors, as well as particulate matter (PM), toxic air contaminants, and greenhouse gases, in order to improve public health and protect the environment and climate.

Recognizing the impact of transportation on ozone, the 2017 CAP includes 23 Transportation Control Measures (TCMs) aimed at reducing motor vehicle emissions due to ozone, particulate matter, air toxics, and greenhouse gas emissions. The TCMs most relevant to TDM are TCM TR2, which calls for supporting voluntary employer-based trip reduction programs, and TCM TR13, which pursues parking policies and strategies. Appendix G contains a list of the 23 TCMs in the Bay Area 2017 CAP.

A significant overlap between the California Clean Air Act and Congestion Management Program's statute occurs in the area of TDM ordinances and programs. TDM implementation is a major feature of the region's Clean Air Plan. VTA administers funding for TDM projects that are aimed at improving air quality, and VTA encourages Member Agencies to implement TDM programs and measures as development projects and land use plans are approved, and as Member Agencies develop and implement Multimodal Improvement Plans (refer to Chapter 10).

CATEGORIES OF TDM STRATEGIES

There is a variety of TDM practices that employers, developers, and local agencies can adopt to manage congestion on the transportation network such as providing cash subsidies, commute options and services, flexible work schedules, and other approaches. The following discussion provides examples of these programs.

PRICING

Pricing strategies aim to adjust the cost of various forms of transportation to encourage more efficient use of the transportation system. These strategies can encourage mode shifts away from single occupant automobile use by adjusting the relative costs of driving and alternative modes. Strategies that raise the price of transportation during the peak period can also shift automobile trips to other times of the day, thus redistributing traffic outside the most congested period of the day.

Parking Cash-Out Program — A parking cash-out program is defined as an employer-funded program under which the employer provides a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space. Under California state law, "parking subsidy" means the difference between the amount out-of-pocket costs paid by an employer on a regular basis to secure the availability of an employee parking space not owned by the employer, and the price, if any, charged to an employee for use of that space. A 1997 survey of eight Southern California businesses using parking cash-out programs found that they reduced single-occupancy commuting by an average of 17% and reduced carbon dioxide emissions by 807 pounds per employee per year. This study also found that the parking cash-out programs were considered fair and efficient by employers and employees, had a benefit/cost ratio exceeding 4.0, and led to increased income tax revenue[2].

[2] Donald Shoup (1997), "Evaluating the Effects of California's Parking Cash-out Law: Eight Case Studies," Transport Policy, Vol. 4, No. 4, 1997, pp. 201-216, as cited in Victoria Transport Policy Institute (VTPI) TDM Encyclopedia chapter on Commuter Financial Incentives (available at http://www.vtpi.org/tdm/tdm8.htm).

Since 1993, California state law (Section 43845 of the Health and Safety Code) has required businesses with at least 50 employees in air basins designated as non-attainment areas to offer parking cash-out. Amendments to the CMP statute adopted in 1992 also require consideration of parking cash-out programs in CMPs. However, the original California parking cash-out legislation (Section 43845) only authorized the California Air Resources Board to enforce the law, and the Board in the past has not had the resources for enforcement. Senate Bill 728 (Lowenthal), approved in October 2009, amended the law to shift enforcement to the local level, by allowing cities, counties and local air districts to impose penalties for violation of the parking cash-out law. These changes to the legislation can be a powerful tool for local agencies to encourage the use of alternative modes, reduce Vehicle Miles Traveled, and reduce GHG emissions due to vehicle use.

The California Air Resources Board (CARB) has developed an informational guide for the implementation of parking cash-out programs. This guide is found in Appendix G.

Unbundled Parking in Residential Developments – While it has historically been commonplace for on-site parking to be provided automatically as part of the rental or purchase price of a residence, some developers are taking up the practice of charging for parking spaces separately. This is known as "unbundling" the price of parking from the price of housing. This practice allows residents who choose to own fewer cars than average for the development to save money by not having to pay for parking spots they are not using, and thus encourages lower rates of car ownership and usage.

Parking Management and Pricing — Charging drivers to pay for parking on city streets or in off-street parking facilities, or increasing the parking costs on city streets and facilities are effective ways to reduce automobile travel. As costs go up, commuters are likely to find alternate ways to reach their destination without paying for parking, such as taking transit to their destination, or carpooling with other commuters. This option is especially useful in dense urban areas where traffic congestion and demand for parking are greatest, and where transit, walking and biking options are typically most available. VTA has recently partnered with the Metropolitan Transportation Commission to provide information and assistance to Member Agencies in Santa Clara County who may wish to pursue parking management and pricing initiatives.

Subsidizing Ridesharing — Employers can encourage carpooling by reimbursing the fuel costs, or by subsidizing, by a pre-determined dollar amount per day, those who choose to carpool. Note, however, that any cash given to carpoolers is taxable income. Employers can encourage vanpooling by subsidizing the cost of the vehicle either directly or indirectly. With vanpools, employers can contribute a certain amount per month tax-free. Employers can also encourage both carpooling and vanpooling by providing preferential parking spaces for these modes close to building entrances.

Employee Pre-Tax Commuter Benefits — Financial incentives for employees through tax credits and other mechanisms are important elements to encourage the use of public transit and other alternatives to driving alone. Promoting such alternatives is critical to reducing traffic congestion and improving air quality. Through changes in federal tax law in the 1990s, employers are free to offer a range of commute fringe benefits without fear of tax consequences. These benefits can either be offered in addition to an employee's base salary, or the employer can offer the benefit "in lieu of compensation." Providing a portion of an employee's income in the form of a transit voucher cuts taxes for both the employer (less FICA tax) and the employee (less income tax).

The Federal TEA-21 legislation clarified that the value of any transportation fringe benefit—including free parking, transit passes or vouchers, and vanpool benefits—is not counted as taxable income if an employee is offered a choice between taxable cash benefits and any combination of transportation fringe benefits. The total amount employers are allowed to offer as a tax free commuter benefit has fluctuated over time; as of 2015, federal legislation allows up to $130.

Transit Subsidies – Some employers and residential developments located near transit are now offering free or discounted transit passes to employees and residents. Programs like VTA's Eco Pass allow employers and residential projects to purchase these passes in bulk to encourage greater usage of the transit system (See the next section, "Programs That VTA Implements" for more details). Caltrain's Go Pass offers a similar program.

Alternative Cash Incentive Programs — These programs allow employees to participate in an incentive program where they are rewarded with gifts and prizes for using alternative commute modes. An example of this program is for companies to hold a monthly raffle for all employees that participate in alternative forms of commuting. In Santa Clara County, many employers offer similar programs to reward employees for not driving alone. For example, Stanford University's Commute Club is a well-established, extensive alternative commuter incentive program. This type of program is a fun and rewarding way to get an entire company or organization involved in promoting alternative commute options.

Road Pricing/Congestion Pricing — Road pricing charges drivers a direct cost for driving on a particular roadway or in a particular area. The related concept of congestion pricing seeks to keep congestion levels on the transportation system below an acceptable threshold by charging users a variable fee. Pricing can encourage some drivers to consider alternative modes of travel, travel times or travel routes, thereby relieving pressure on the most congested facilities at peak hours. This strategy is especially effective in reducing single occupancy commute trips if there are alternative commute options such as transit service and ridesharing to choose from.

Express Lanes — Express Lanes are modified HOV lanes that allow non-carpool drivers to use the lane for a fee that varies depending on traffic conditions. This strategy takes advantage of excess capacity in HOV lanes, making more efficient use of the existing roadway system, and has the added benefit of raising revenue for future corridor improvements, including express bus services operating in those lanes.

ALTERNATIVE MODES

Providing options and services to travelers makes it easy for them to change their travel mode. The following is a list of strategies that can reduce the number of travelers that drive alone to their destination.

Bicycle and Pedestrian Improvements –Perhaps the most basic improvement to encourage a shift away from single occupant automobile travel is an enhanced environment for pedestrians and bicycles. These strategies make the streets safer, more vibrant, and attractive for those who arrive at a destination without a car. Bicycle and pedestrian improvement strategies include traffic calming and complete streets policies; provision of a complete sidewalk and walking path network; bike lanes, racks and other facilities; and publicity campaigns that encourage drivers to share the road safely.

Carpools and Vanpools— An alternative to driving alone is to find other commuters heading to the same or similar destinations and form a carpool or vanpool. This saves commuters money on gas, allows them to partially avoid the stress of driving every day, and reduces congestion and carbon emissions by taking some cars off the road. Employers and other organizations can help employees form carpools by maintaining a central database of potential carpoolers. This database can be web-based to provide easy access to company employees. Additionally, 511.org maintains a free to the public regional ride-matching database for the nine-county Bay Area, and provides employer-exclusive ride-matching. The 511.org web-based matching system allows individuals to instantly access a list of commuters – and a link to their email – with which they could share their commute.

Vanpooling is a convenient and popular way to get to work, especially for people who work far from home. “Official” vanpools have seven to 15 passengers, including the driver (who usually rides for free!), and the vehicle may be owned by one of the vanpoolers or leased from a vanpool rental company. 511.org also helps individuals join an existing vanpool, as well as helps individuals or companies start their own vanpools.

Car Sharing Programs —Car sharing programs make vehicles available to people on a per-use basis. They allow people to use a car when they need it without incurring fixed costs. Fees are

paid based on how much the driver uses the car. Lots are conveniently located throughout the urban area, and reservations are quick and easy, and available on-line.

Car sharing expands mobility options by providing people access to a car when they need one, but frees them from having to select it as the habitual mode of choice. Car-sharing has a multitude of benefits:

- Fewer parking spaces are needed for automobile storage, since multiple people use the same car. This reduces the costs of housing since fewer parking spaces would be required for each dwelling unit.
- Developers are able to build more housing on the same amount of land because fewer parking spaces are required.
- Residents and employees are given access to an entire fleet of cars conveniently located throughout the area.
- Companies have access to fleets of vehicles for meetings outside the office, only incurring charges per hour and/or per mile use.

And as usage grows so does convenience of access to the shared cars, since more people accessing the system means more pick-up and drop off locations.

Bike Sharing Program — Bike sharing programs make bicycles available to people on a per-use basis. Similar to car-sharing programs, in a bike sharing program users generally pay fees based on how long they use the bicycle. Bicycles are conveniently located in "pods" throughout an area, usually near transit stations and major trip generators. Payment is accomplished conveniently with a credit or debit card.

Guaranteed Ride Home — Often employees are not interested in using alternative modes because the modes are perceived as being inflexible. Without a guarantee that they will be able to get around in an emergency, many employees will continue to drive alone to work. Guaranteed Ride Home (GRH) programs are designed to address this issue. Employees who enroll in GRH programs receive access to transportation such as taxi service in the event of a personal emergency, for a limited number of times every year. GRH programs have found that while enrollees rarely use the program they, perhaps more importantly, gain peace of mind from the enrollment and are more willing to commit to alternative forms of transportation.

First and Last Mile Connections — First and last mile services are an integral component of building a viable transit network in a suburban environment. First and last mile conditions can be improved with good park–and–ride facilities and innovative shared-ride and parking strategies, strong bicycle and pedestrian connections with both residential and employment areas, and the application of new technologies or programs such as car and bike sharing.

Park and Ride Lots – These lots provide convenient locations for workers who do not live within easy walking distance of a transit stop to drive to a nearby parking lot and take transit the rest of the way to work. This increases the appeal of the transit system by making it useful even to people who live in outlying, low density areas that are difficult for transit to serve directly.

EMPLOYMENT AMENITIES AND SERVICES

These strategies rely on employers to provide amenities that encourage alternative modes or allow flexibility in where and when work gets done, opening up the possibility of reducing the transportation demand during the most congested periods of the day.

On-Site Amenities and Services — Offering employees the amenities they need at or near their work site can make alternative commute modes more desirable. Popular amenities include bicycle facilities, pedestrian friendly networks, and employee-serving uses (e.g., restaurants, ATMs, postal services) both on-site and off-site. Employers also have the opportunity to provide their employees with transportations services that take their employees offsite such as shuttle services to activity centers during lunch, or the use of company vehicles for personal trips during the day.

Flexible Schedules and Work Arrangements — Simply allowing workers to set their own work hours, or setting staggered working hours, can change the company's peak travel period and reduce peak-period demand on the roadway system.

Telecommuting — Some companies have provided hardware and software so that employees can access the company network from home. Hooked into the network from home, these employees may not need to show up at the office at all. While it may not be reasonable or desirable to send employees home all the time, making telecommuting an option for some employees a few days out of the workweek can significantly reduce a company's overall peak-period trips.

New Working Arrangements — Some companies have begun to question the traditional model of maintaining a central office where workers converge every day. For workers whose primary work is done on a computer rather than at a factory, the traditional office model is not necessarily the only workable one. Evidence suggests that some workers have already discarded the model of going to the office every day.

JOBS/HOUSING BALANCE AND MIXED USES

This category covers a range of strategies that bring the places people go throughout the day – employment sites, shopping, entertainment, etc. – closer to where people live, thus requiring

fewer and/or shorter trips to accomplish daily tasks. This requires a fundamental shift in thinking about the purpose of transportation, which has generally been conceived over the past few decades in the United States to be mobility – or the ability to move unimpeded throughout the region at consistently high speeds. A new paradigm focuses instead on access, the ability to reach destinations. Under this paradigm, some amount of localized congestion in dense, urban activity centers can be a good thing if it results from a mixed use built environment where people are able to get around by walking, biking, transit, and short car trips. In the long run, the region as a whole will experience reduced vehicle travel and improved air quality as a result of such development. See Chapter 7 for more information on VTA's efforts in these areas.

PROMOTIONS AND MARKETING

Public knowledge and attitudes have strong effects on travel behavior, so these strategies are important to TDM implementation. As a general distinction, promotion strategies aim to increase awareness of information people need to participate in TDM programs, while marketing strategies seek to understand, guide and influence travel behavior.

Promotion strategies include: bike, pedestrian, and transit maps that are widely available; education programs for public officials, businesses, and employees about TDM; websites or smartphone applications to provide information about transit and alternative travel options; wayfinding systems that make the transit system easier to understand; signage programs or publicity campaigns that encourage drivers to "share the road" with cyclists and pedestrians; and school programs that educate children about modes of transportation (for example, bicycle education is part of the standard curriculum in elementary schools in the Netherlands).

Marketing campaigns include: events such as a "bike to work week" or "eco-commute challenge"; surveys to determine travel preferences, knowledge and opportunities among the population of an area; campaigns that highlight the benefits of alternative modes and seek to change public attitudes; temporary discounts or free service on public transit to encourage people to try the system; and campaigns that connect transportation mode choice to environmental objectives, such as the Bay Area's "Spare the Air" campaign.

TDM PROGRAMS THAT VTA IMPLEMENTS

VTA's current countywide transportation plan, VTP 2040, and its Community Design & Transportation (CDT) Program encourage the development and continuation of successful trip reduction efforts through partnerships and incentive programs. Over the years, public agencies have taken the role of enforcing performance standards during the development review process. Developers that are not able to conform to these standards are able to implement TDM measures as a way of mitigating or lessening impacts. TDM has been a useful tool in managing the impact of development projects with auto LOS as the primary performance

metric for transportation analysis, and TDM will continue to play an important role as the emphasis shifts to VMT under SB 743.

In addition, even in the absence of a government mandate to enforce TDM practices, some companies are willing to maintain TDM programs as community and employee benefits, and may commit to trip reduction measures when applying to build new or expanded facilities. VTA, through its Development Review Program (described in Chapter 7), works with local agencies to review and comment on transportation and environmental analyses of development proposals, and offers recommendations regarding TDM measures where appropriate. In addition, VTA maintains several successful TDM programs, listed below.

ECO PASS

The Eco Pass program allows employers, developers, educational institutions, management companies or homeowners associations the ability to purchase VTA transit passes at a bulk discount rate to provide to employees or residents to encourage transit usage. Eco Passes are good for unlimited use of VTA Bus and Light Rail services, seven days a week. The program also includes an "Emergency Ride Home" provision that allows Eco Pass holders to take a taxi home if they need to leave work in the middle of the day.

SHUTTLE PROGRAM

VTA operates eight free shuttle lines from Great America Station in Santa Clara as well as a Downtown Area Shuttle (DASH) from Diridon Station in downtown San Jose. In 2018, the DASH will be upgraded to a Rapid service, offering faster and more frequent service with additional connections between Diridon Station, downtown San Jose, and the Berryessa/North San Jose BART station. These shuttles help solve the "first and last mile" dilemma that may prevent some commuters from choosing transit when the station is too far from where they live or work. These shuttles bridge the gap and connect commuters to job sites in Sunnyvale, Santa Clara, Mountain View, Palo Alto, Milpitas, North San Jose, and downtown San Jose.

PARK AND RIDE LOTS

VTA maintains 41 park and ride lots in 12 different cities throughout Santa Clara County. The lots connect commuters with VTA's light rail system, Caltrain, Capitol Corridor, Altamont Commuter Express, and several express bus routes.

BIKE SHARING PROGRAM

The Bay Area Bike Share pilot program was launched with public funding in August 2013 in five cities in the Bay Area along the Caltrain Corridor. VTA provided funding for the pilot program in Santa Clara County. The pilot system included 700 bicycles and 70 stations. The participating

cities in Santa Clara County included San Jose, with 16 stations and 129 bicycles, Mountain View, with seven stations and 59 bicycles, and Palo Alto, with five stations and 37 bicycles.

The pilot program concluded in June 2016. As the pilot program was winding down, the Metropolitan Transportation Commission entered into an agreement with a private bike share vendor to operate Bay Area Bike Share under a corporate sponsorship model, using no public funds. In September 2016, Ford Motor Company announced that it would be the title sponsor for the rebranded and expanded bike share system. Ford GoBike will expand bike share to 7,000 bicycles in San Jose, San Francisco, Oakland, Berkeley, and Emeryville The first set of new bicycles and stations were installed in summer 2017.

Palo Alto and Mountain View are not included in the expansion agreement. As of September 2017, these cities are evaluating options for continuing bike share in their communities.

Bike Share programs are intended to:

- Provide access to the first and last mile from major transit stations
- Supplement VTA and employer shuttles between transit and employer sites
- Relieve overcrowding and the routine “bumping” of passengers with bicycles on Caltrain (and on VTA buses or light rail)

HOV LANES AND EXPRESS LANES

VTA, in cooperation with Caltrans, plans for and maintains HOV lanes throughout Santa Clara County to encourage more efficient use of highways. Santa Clara County has the most extensive HOV network of any county in the Bay Area with 190 miles of HOV lanes.

In 2008 the VTA Board of Directors approved the Silicon Valley Express Lanes Program. As part of the Program, the Express Lanes projects will implement a roadway pricing system to allow solo commuters to use the available capacity in the carpool lanes for a fee. The fee would change dynamically in response to existing congestion levels and available capacity in the carpool lanes.

On March 20, 2012, VTA opened the first express lane in Santa Clara County on the SR 237/I-880 connector ramp. During FY 2017, over 3,030,000 vehicles used the express lane including over 465,000 solo drivers (about 15%). The express lane produced estimated toll revenues of $1,270,000 during FY 2017. Data shows that the express lane has successfully improved travel speeds, reduced congestion, increased traffic throughput and provided overall improved traffic operations in the corridor.

The Silicon Valley Express Lanes program includes additional express lane projects under development in Santa Clara County, including SR 237 Phase II, US 101, and SR 85.

FUNDING FOR TDM PROGRAMS

Transportation Demand Management programs can be funded by a wide variety of public and private sources, some of which require VTA involvement or coordination in Santa Clara County.

VTA administers several funding programs that support TDM and alternative modes of transportation: the BAAQMD's Transportation Fund for Clean Air (TFCA), the Santa Cara County Vehicle Emissions Based at Schools (VERBS) Program, the State's Transportation Development Act (TDA), and the Congestion Mitigation and Air Quality (CMAQ) Program. These funding sources are described below, along with descriptions of the federal funding sources which fund the STIP. See Chapter 8 (Capital Improvement Program Element) for more information on these funding programs.

Transportation Fund for Clean Air — The Transportation Fund for Clean Air (TFCA) grant program is funded by a surcharge on vehicle registrations. Assembly Bill (AB) 434 (Sher, 1991), signed into law by Governor Wilson in 1991 added Section 44241 to the California Health and Safety Code, and gave the BAAQMD the authority to collect a surcharge of up to $4 on motor vehicle registration fees paid within its jurisdiction. These funds are administered by BAAQMD and used for programs that will reduce motor vehicle emissions.

Sixty percent (60 percent) of TFCA monies are retained by BAAQMD and distributed on a regional, competitive basis. The remaining forty percent (40 percent), also known as "Program Manager Funds," are returned to the county of origin for allocation within the county on a discretionary basis. VTA is the designated program manager for Santa Clara County.

By statute, only the following project types are eligible for TFCA funds:

1. Implementation of ridesharing programs.
2. Purchase or lease of clean fuel buses for school districts and transit operators.
3. Provision of local feeder bus or shuttle service to rail stations, ferry stations and airports.
4. Implementation and maintenance of local arterial traffic management, including, but not limited to, signal timing, transit signal preemption, bus stop relocation and "smart streets."
5. Implementation of rail-bus integration and regional transit information systems.
6. Implementation of demonstration projects in congestion pricing of highways, bridges, public transit, and low-emission vehicles.
7. Implementation of a "smoking vehicles" program.
8. Implementation of bicycle facility improvement projects that are included in an adopted countywide bicycle plan or congestion management program.

9. The design and construction by local public agencies of physical improvements that support development projects that achieve motor vehicle emission reductions. The projects and the physical improvements shall be identified in an approved area-specific plan, redevelopment plan, general plan, or other similar plan.

Legislation AB 414 (1995) references the trip reduction requirement in the CMP legislation and states that Congestion Management Agencies in the Bay Area that are designated as AB 434 program managers "shall ensure that those funds are expended as part of an overall program for improving air quality and for the purposes of this chapter (the CMP Statute)."

The Air District has interpreted this language to allow a wide variety of transportation control measures now eligible for funding by program managers, including an expansion of eligible transit, rail and ferry projects.

Applications for the regional TFCA (60 percent) funds are made directly to BAAQMD in May of each year. The maximum project award is $1.0 million. The VTA Congestion Management Program, subject to BAAQMD approval, administers the funds for the remaining 40 percent program.

While there is no maximum award in the 40 percent program, Santa Clara County generally receives about $2.0 million per year for the entire program. Member Agencies apply to VTA in late January.

Santa Cara County Vehicle Emissions Based at Schools (VERBS) Program — VERBS is a competitive grant program that funds infrastructure improvements and education/encouragement programs that encourage K-12 students to safely walk, bike, carpool, and ride transit to school. The program was initiated through the Metropolitan Transportation Commission's (MTC) Climate Initiative Program, with a focus on reducing greenhouse gases by shifting travel behavior. VTA administers the program in Santa Clara County. All Member Agencies within the County are eligible to apply.

The purposes of the program are to: 1) facilitate the planning, development, and implementation of a project and/or activity that will reduce traffic, fuel consumption and air pollution in the vicinity of schools; 2) reduce traffic related injuries and fatalities to school children; 3) enable and encourage children, including those with disabilities, to walk and bicycle to school; and 4) make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age. As administrator of the VERBS program, VTA staff has released three calls-for-projects. On December 9, 2010, VTA Board of Directors approved the Cycle 1 program of projects. It included five non-infrastructure and five infrastructure projects, totaling approx. $6.6M. The

Board approved the Cycle 2 program of projects on May 2, 2013, which included four non-infrastructure and three infrastructure projects, totaling approx. $5.4M.

Prior to the Cycle 3 call-for-projects release, on April 6, 2017, the Board revised the VERBS program to direct all available funds only to infrastructure projects. Further, the Board approved the proposal that non-infrastructure projects compete for 2016 Measure B Bicycle and Pedestrian Program Education and Encouragement grant funds. Following that action, the Board approved the Cycle 3 program of projects on August 3, 2017, totaling approx. $6.9M. This cycle included seven fully funded projects and one partial funded.

Non-infrastructure Projects:

- Mountain View—Cycle 1, Cycle 2
- Palo Alto—Cycle 1
- San Jose—Cycle 1, Cycle 2
- Santa Clara—Cycle 1, Cycle 2
- Sunnyvale & County—Cycle 1, Cycle 2

Infrastructure Projects:

- Campbell—Cycle 2, Cycle 3
- Gilroy—Cycle 1
- Los Altos—Cycle 3
- Los Altos Hills—Cycle 1
- Milpitas—Cycle 1
- Mountain View—Cycle 2
- Palo Alto—Cycle 2, Cycle 3
- San Jose—Cycle 1, Cycle 3
- Santa Clara—Cycle 1, Cycle 3
- Sunnyvale—Cycle 3

Transportation Development Act (TDA), Article 3 Projects — The State's Transportation Development Act includes several sections or articles – each with a separate project emphasis. Article 3 funds pedestrian and bicycle facilities. TDA funds are derived from a quarter-cent gas tax, returned to the County of origin.

The application and distribution process varies by County. In Santa Clara County, approximately 70% of the annual TDA Article 3 allocation is distributed to member agencies on a prorated basis according to population. The remaining 30% is distributed as discretionary funding on a countywide competitive basis. All TDA Article 3 applications are subject to MTC approval.

Member Agencies submit applications to MTC and VTA in mid-January. Projects are evaluated and prioritized by VTA and Member Agency staff, the Bicycle & Pedestrian Advisory Committee, the Technical Advisory Committee, the Policy Advisory Committee, and VTA Board of Directors. VTA submits the TDA Article 3 priority list of projects to MTC.

Congestion Mitigation and Air Quality Program (CMAQ) — CMAQ funds are to be used to implement the transportation provisions of the 1990 Federal Clean Air Act. These funds are only available to areas designated as non-attainment areas. The Bay Area was briefly designated as an attainment area in 1995. That status was subsequently lost in late 1998 after a series of ozone exceedances in the summers of 1995, 1996, and 1997. Both of these funds are described in more detail in Chapter 8.

The Metropolitan Transportation Commission (MTC) has final programming authority over CMAQ funds. Programming is coordinated at the County level by the CMAs. TDM projects are fundable as system management projects.

Other Sources of TDM Funding — Appendix H provides information on other sources of TDM funding, such as Benefit Assessment Districts, Developer funding, Transportation Impact Fees, and other programs.

COMPLIANCE AND CONFORMANCE

VTA does not require local jurisdictions to implement TDM programs in order to be in conformance with the Congestion Management Program. However, the VTA Multimodal Improvement Plan process encourages TDM-oriented actions in cases where a CMP facility has fallen or is forecasted to fall below the CMP standard where it is infeasible or undesirable to mitigate the impact by increasing capacity. These actions form the basis of a Multimodal Improvement Plan (see Chapter 10). In addition, as noted elsewhere in this document, two Multimodal Improvement Plans have been adopted in Santa Clara County to date which include TDM measures in their program of offsetting improvements, and two additional MIPs are currently under development. VTA will monitor the status of the implementation of the measures in these Plans through the Implementation Status Reports submitted by local agencies (described further in Chapter 10).

CHAPTER 6 | TRANSPORTATION MODEL AND DATABASE ELEMENT

This chapter describes the VTA CMP Countywide Transportation Model and Database Element. It contains the following sections:

- CMP Transportation Model and Database Requirements
- Overview of the CMP Transportation Models
- Transportation Model and Database Maintenance
- Compliance and Conformance

Transportation models are analytical tools that can be used to assess the impacts of land use and development decisions on the transportation system. Transportation models are based on a complex interaction of relationships between variables: a simple example might be the relationship between changes in the price of gasoline and the number of vehicle-miles traveled or transit ridership. They are tools that can be used to project future transportation conditions to determine the need for and effectiveness of transportation projects and infrastructure improvements. As long as the basic relationships established in a base year model validation remain well behaved over time, a well-designed and validated transportation model should predict transportation conditions with some degree of confidence.

The CMP transportation database consists of data that describes existing and future transportation network conditions and socioeconomic characteristics in a quantitative manner. The databases are a basic input for the VTA Countywide model (CMP model) and are typically updated based on updates to the regional socioeconomic data sets provided by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) and through periodic updates of the transportation networks during updates of the regional and countywide long-range transportation plans.
The CMP model serves several purposes:

1. Evaluating the transportation impacts of major capital improvements on the countywide CMP System—including those contained in the CMP Capital Improvement Program (CIP).
2. Establishing transportation system characteristics for use by Member Agencies in performing transportation impact analyses, developing local transportation models, and preparing deficiency plans.
3. Providing roadway volume and transit ridership forecasts to support planning studies, environmental analysis, project engineering and design.
4. Helping summarize the relationship between land use decisions (approved development projects) throughout the County and the CMP transportation system.

As this list indicates, the CMP model serves as a fundamental tool for achieving the goals of the CMP: improving transportation conditions and air quality in Santa Clara County.

CMP TRANSPORTATION MODEL AND DATABASE REQUIREMENTS

The CMP Statute requires VTA to develop a uniform database and model for evaluating transportation impacts.[1] The Statute specifies the following three requirements for the CMP database and model, which are discussed in detail below:

1. VTA must develop a uniform database and model for use throughout the County.
2. VTA must approve computer models used by local jurisdictions to determine the transportation impacts of land use decisions on the CMP System.
3. The CMP database and model must be consistent with the Metropolitan Transportation Commission (MTC) regional transportation databases and model.

UNIFORM DATABASE AND MODEL

The legislative requirement for a uniform countywide model and database is critical to the success of the overall Congestion Management Program. The CMP model is used to assist in the land use impact analysis program, to help evaluate projects for inclusion in the Capital Improvement Program; to evaluate system-level improvements to the CMP System due to deficiency plans; and to assist with VTA service and project planning.

In 2005, VTA completed the latest major CMP model update, which has improved overall effectiveness by adding detail to Traffic Analysis Zones expanding the number of internal zones from 385 to 1490 and adding zones associated with four new external counties (San Joaquin, Santa Cruz, Monterey, and San Benito) and consistency with the MTC regional model, expanded geographical extent that incorporates surrounding counties, and updated travel patterns and socioeconomic data that reflects Census 2010 data. The 2005 model has since been improved and is referred to herein as the current model. These specific improvements will be described in later sections of this chapter.

LOCAL MODEL CONSISTENCY

In addition to the requirement for developing a countywide model, the CMP Statute requires that models developed by Member Agencies to project local transportation conditions be consistent with the CMP model and database. This is a logical requirement that helps assure

1 California Government Code Section 65089 (c)

that all Member Agencies are using uniform techniques to evaluate the impacts of development projects.

Returning to the concept of transportation models as tools, it is clear that local transportation models will serve a similar purpose. Local models, however, operate on a different scale. While a countywide model may be able to predict future traffic volumes on a roadway, a local model would be capable of predicting the number of vehicles that turn left at a specific intersection. In general, since local transportation models are able to include more background information they provide more detailed "city-specific" information than a countywide model.

The CMP Technical Standards include Local Transportation Model Consistency Guidelines. These guidelines provide guidance to jurisdictions in developing or modifying their transportation models for consistency with the CMP models. They identify characteristics required of local models and the relationship of transportation models to traffic impact analyses. The most recent version of the Local Transportation Model Consistency Guidelines was adopted by the VTA Board in 2009.

REGIONAL TRANSPORTATION MODEL AND DATABASE CONSISTENCY

Consistency with the regional transportation model and database is one of the most important requirements of the CMP Statute. This section describes the regional model and database and consistency requirements.

MTC Regional Transportation Model — The Metropolitan Transportation Commission (MTC) is responsible for developing the Bay Area's regional transportation model. MTC has been developing a series of transportation models since the mid-1960s. MTC has recently converted the regional models from trip-based to tour-based models (MTC Travel Model One) and is expected to refine the activity-based models in the very near future. MTC is currently updating the travel analysis zone structure and transportation networks of the regional models. The CMP models are based on the previous version of the MTC transportation planning models known as BAYCAST-90. The BAYCAST-90 travel model demand system was originally developed using 1990 Census data and data from the 1990 regional household travel survey incorporating travel diary data from more than 10,000 households.

ABAG Database — The MTC models use input socioeconomic data prepared by the Association of Bay Area Governments (ABAG). ABAG projections provide estimates of employment, land use, housing, population, and household income at regional, county and census tract levels. ABAG updates its database forecasts every four years. These updates are based on surveys of local land use and development policies as well as revised national, state, and regional forecasting assumptions. The most recent version of ABAG's officially adopted database for

congestion management application is Projections 2013 (P2013). The P2013 series provide forecasts at five-year intervals from year 2010 to the year 2040. The P2013 regional socioeconomic data represents the Sustainable Communities Strategy scenario as required by California SB 375, and was used in the recently adopted MTC Regional Transportation Plan Bay Area. MTC and ABAG have recently updated the regional growth forecasts in July 2017 (P2017), however, those datasets will not be available until early 2018.

The CMP model currently uses the P2013 data set developed by ABAG. The P2013 ABAG Census Tract level allocations were sub-allocated to the smaller CMP zones based on local development characteristics to reflect the most recently adopted General Plans and specific plans for the cities of San Jose, Santa Clara, Milpitas and Gilroy, and based on the locations of approved development projects, developed in coordination with local jurisdictions. City-level control totals of households, employed residents and jobs were maintained for each jurisdiction in Santa Clara County, however, allocations at the census tract level were different than ABAG, as the growth was reallocated to reflect local approved development plans and projects.

VTA tracks major development project construction activity through an informal data collection process of tracking media reports, visiting sites in the field and communicating with Member Agency staff. During late 2014 and early 2015, VTA utilized this process to develop a "2018 Land Use Scenario" providing a reasonable projection of growth through the year 2018 based on projects under construction or recently completed since early 2014 throughout the county. The year 2018 was selected as the horizon year to coincide with the opening of Phase I of the BART Silicon Valley Extension. VTA intends to continue tracking growth and development in the county to assist in future transportation forecasting efforts and assist in allocating growth from the regional level to the local jurisdiction level.

CMP Model and Database Consistency — The CMP model and database are developed to be consistent with the MTC BAYCAST-90 model equations and the ABAG P2013 databases. MTC prepared updated consistency requirements for the CMP[2] in 2011. These requirements have not been updated as of fall 2017. Summaries of the checklist outputs are provided to MTC in a separate submittal. More details regarding specific consistency issues are described in the following sections.

CONSISTENCY WITH MTC MODEL

As noted previously, the CMP model was designed to be consistent with the previous MTC Travel Demand Model forecasting system BAYCAST-90 model. The next section provides a

2 Appendix B of MTC Resolution No. 3000, June 2011, *MTC Checklist for Modeling Consistency for CMPs*

general overview of the CMP models and also describes several basic modeling characteristics that are shared between the models.

OVERVIEW OF THE CMP TRANSPORTATION MODELS

The CMP models developed for Santa Clara County and currently in use have undergone a series of revisions and enhancements since the original CMP models developed by the Santa Clara County Center for Urban Analysis (CUA) in 1991. The CUA models were a subarea model with a focus on travel patterns in Santa Clara County for 385 zones with travel into and out of the county treated as volumes to and from approximately 100 external zones. This structure was essentially maintained until early 2001 when the 1099 zone MTC regional model, with an addition of about 100 zones in Santa Clara County, was used to develop forecasts for the BART extension to Santa Clara County feasibility study. Shortly thereafter, a complete restructuring of the CMP models, also referred to as the VTA Countywide model, was developed in 2003 using the 1454 zone MTC BAYCAST-90 regional model as the foundation with significant zone and network detail added within Santa Clara County. That version of the VTA Countywide models also included the addition of transit submodes in the mode choice models, as well as expansion of the model region to include 4 addition counties of Santa Cruz, Monterey, San Benito and San Joaquin. The current VTA Countywide model is quite similar to the models developed in 2003, and has had a variety of improvements to more accurately capture markets not modeled in the MTC BAYCAST-90 models (air-passenger trips, truck vehicle trips and bicycle assignments) and to reflect Federal Transit Administration (FTA) recommendations for purposes of New Starts ridership forecasting. The following sections describe the most important characteristics of the VTA Countywide models (referred to as the CMP model).

Transportation Analysis Zones (TAZ's) — The current CMP model has a more refined zone system in Santa Clara County and San Mateo County than the MTC regional models. Additional zones were added to more accurately reflect and support the added roadway network and to provide more detail in transit rich corridors and dense central business districts. In all, an additional 1,122 zones were added in Santa Clara County, and 156 zones were added in San Mateo County. The new model maintains the use of MTC's zone system in the remaining seven Bay Area counties, but enlarges the full model region and zones to include Santa Cruz, San Benito, Monterey, and San Joaquin Counties.

Highway Network and Transit Network — The roadway network used by the CMP model includes additional detail in both Santa Clara and San Mateo Counties. The current CMP model also includes detailed stop, station and route detail in the transit networks for San Mateo and Santa Clara Counties, yet maintains the MTC roadway and transit networks in the remaining Bay Area counties. The Association of Monterey Bay Area Governments (AMBAG) provided the basis for roadway networks in Monterey, San Benito, and Santa Cruz counties and the San

Joaquin County COG provided roadways for San Joaquin County, however, the detailed networks were simplified to match the coarser zone structure in each of those four added counties. Express lane facilities, representing the MTC 'Backbone' express lanes system for 2040, were coded in the network with a toll facility indicator based on the highway corridor segment and the direction of travel. Differential toll facility codes were required in order to apply specific toll rates to optimize utilization of the express lanes to preserve level-of-service for free carpool users. A recent enhancement added to the CMP model is the explicit assignment of bicycle trips to the bicycle subnetworks. Bicycle travel speeds are a function of observed speeds collected using GPS-enabled devices and the mode choice models were revised to directly consider changes to bicycle travel times based on bicycle infrastructure improvements.

Capacities and Speed — The current CMP model incorporates the area type and assignment group classification system published by MTC in BAYCAST-90. Input free-flow speeds for expressways are slightly lower in the CMP models to more accurately match the travel time for the expressway segments during model validation and improve the assignment match of estimated to observed expressway volumes.

Trip Purposes — The current CMP model uses the same trip purposes used in the BAYCAST-90 model and also uses additional trip purposes not modeled by MTC. CMP model trip purposes include the following:

- Home-based work trips
- Home-based shop and other trips
- Home-based social/recreation trips
- Non-home-based trips
- Air-passenger trips to SFO, San Jose Mineta and Oakland International airports,
- Home-based school: grade school, high school, and college trips
- Light, medium and heavy duty internal to internal zone truck trips

The CMP model uses MTC BAYCAST-90 trip generation equations for trip production and trip attraction functions for all trip purposes listed above. In order to address special markets not included in the MTC trip purposes, the CMP model includes several additional trip purposes beyond those modeled by MTC, including:

- Air-passenger trips to San Francisco International (SFO) Airport and San Jose/Mineta International Airport (SJC) and
- Light, medium and heavy-duty external truck trips

Market Segments — The CMP model adopts the BAYCAST-90 disaggregate travel demand model four income group market segments for the home-based work trip purpose in trip generation, distribution and mode choice. In addition, the CMP model also maintains the three workers per household (0, 1 and 2+ workers) and three auto ownership markets (0, 1 and 2+ autos owned) used in the MTC worker/auto ownership models. Trips by peak and off-peak time period are also stratified in the trip distribution, mode choice and highway and transit assignment models.

External Trips — The CMP model uses a different approach for incorporating inter-regional commuting estimates than MTC. For external zones coincident with the MTC model, MTC interregional vehicle volumes were applied for base year 2000 and adjusted to the future by assuming a 1 percent growth rate per year. For external gateways from San Joaquin County and Santa Cruz, Monterey and San Benito Counties, the incorporation of those counties as internal modeled areas obviated the development of external vehicle volumes for those areas of the CMP models.

Pricing — The CMP model uses MTC pricing assumptions for transit fares, bridge tolls, parking charges, and auto operating costs as assumed in the current 2013 MTC Regional Transportation Plan (RTP) and Sustainable Community Strategies (SCS) update. All prices are expressed in year 1990 dollar values in the models. The CMP model also uses regional express lane toll charges for the AM and PM peak periods that are based on optimizing the level-of-service in the carpool lanes through an iterative process in the highway assignments. Depending on the level of utilization, these toll charges vary by direction, time of day and by specific corridor.

Auto Ownership — The current CMP model applies BAYCAST-90 for auto ownership models to estimate the number of households with 0, 1, and 2+ autos by four income groups in each traffic analysis zone. Walk to transit accessibility measures were incorporated in the auto ownership models consistent with MTC BAYCAST-90 to more logically associate low auto ownership households with transit services. The auto ownership models were last calibrated to match 2010 American Community Survey workers per household and auto ownership by county.

Mode Choice — The mode choice models for BAYCAST-90 include the use of nested structures for most trip purposes, however, explicit estimation of nested structures to consider transit submodes were not included in the model specification[3]. The CMP model adds a nesting

[3] A nested structure partitions the alternatives into groups (nests) of similarity. The groups can be further generalized into subgroups (subnests) and so on, which has the form of an inversed tree.

structure for transit submodes of local bus, express bus, Bus Rapid Transit (BRT), light rail, heavy rail and commuter rail underneath the MTC BAYCAST-90 nested structures. Consistent with the BAYCAST-90, mode choice coefficients are preserved by constraining the model to the BAYCAST-90 parameters, except those in transit submode structure. While the CMP model includes a transit submode nest for Bus Rapid Transit (BRT), which is an emerging transit technology in the region, BRT is treated as a local bus mode primarily due to limitations from the combined frequency process in the transit travel time builder used in the CMP models.

Peak Hour and Peak Periods for Highway Assignments — The CMP model uses a three-hour peak period (6 AM to 9 AM) as the basis for determining drive alone, shared-ride, and transit travel times for input to the trip distribution and mode choice models. This was assumed since peak hour travel volumes tend to produce extremely congested conditions for forecast years producing unrealistic volume to capacity ratios and travel times, thus significantly overestimating forecast transit probabilities. The highway assignments produce AM and PM peak hour volumes, AM and PM peak period volumes (5 AM to 9 AM and 3 PM to 7 PM, respectively – each coincident with the time periods of operation for carpools), midday volumes (9 AM to 3 PM) and evening volumes (7 PM to 5 AM). The four time period volumes are then added together to develop daily vehicle volumes.

Vehicle and Transit Assignments — The current CMP model incorporates a methodology analogous to the MTC "layered," equilibrium assignment process, which distinguishes standard mixed-flow lanes from high-occupancy-vehicle (HOV) lanes. The equilibrium assignment process used in the current CMP model is functionally equivalent to the MTC methodology. The CMP model includes additional vehicle classes in the highway assignments for park-and-ride vehicles and drive-alone and carpool toll vehicles.

Drive-alone and carpool toll vehicles for AM and PM peak periods are estimated using a toll model post-processor that estimates toll volumes based on a comparison of the non-toll and toll travel times and costs. This procedure assumes that toll choice occurs after the decision to choose auto versus transit has already been considered, and therefore does not influence transit mode choice. A toll choice constant for drive-alone and carpool modes was developed based on a calibration of toll volumes estimated by application of the toll model to the I-680 Express Lane and SR 237 Express lane facilities, and a comparison of estimated to observed express lane volumes. It should be noted that by 2035, in order to maintain the operational feasibility of implementing regional express toll lanes, it was assumed that only 3+ occupant carpools would be allowed to travel in the carpool lanes for free. This was assumed for all carpool facilities in the model region, regardless of the presence of express lanes.

In the current CMP model, transit passengers are assigned with a methodology analogous to that used by MTC, with separate assignments for each transit submode and access mode. Assignments are also performed separately for peak and off-peak conditions. A total of eighteen separate transit assignments are run to cover the full combination of transit submode and access modes as well as to estimate transit ridership for air-passengers and external home-based work transit trips from the San Joaquin (ACE, BART and San Joaquin SMART bus) and AMBAG (Caltrain and Monterey Express) model regions.

Model Validation with 2013 Traffic and Transit Volumes — The current CMP model is validated to year 2013 traffic volumes for city jurisdiction level and county-level vehicle-miles stratified by facility type. Four time periods are validated: AM peak hour and peak period (5 AM to 9 AM) and PM peak hour and peak period (3 PM to 7 PM). Daily transit boardings were validated for the year 2013 at the system level for major regional transit operators (Caltrain, BART, MUNI, VTA and AC Transit) and at the route level for VTA light rail, local bus and express bus routes.

TRANSPORTATION MODEL AND DATABASE MAINTENANCE

It is critical to maintain and update a transportation model and database on a regular basis. Elements of the CMP model are updated on an annual basis subject to availability of data used to refine different components of the models. For example, the base year of the CMP Model was changed from 2000 to 2010 and revalidated in 2013 with the availability of new traffic and transit count data. VTA has recently updated the CMP models to reflect new 2010 Census data, data from the American Community Survey as well as incorporating the new ABAG P 2013 data sets. This section describes the local data sources that are used in updating the model as well as the updating process itself.

LOCAL DATA

The CMP annual monitoring process provides a significant amount of local data that is used to update the CMP model. The two main sources of local data are described below.

Observed Traffic Volumes — The VTA CMP and Member Agencies prepare regular reports of actual traffic volumes at CMP System intersections for the PM peak hour conditions; the CMP, as part of the monitoring program, reports traffic volumes at selected freeway locations for both AM and PM peak period (3-hour) conditions. VTA has recently started to collect bicycle and pedestrian data at CMP intersections for the PM peak hour, which will be used to validate the CMP models. MTC and Caltrans also provide observed data on freeways and state highway for total volumes as well as carpool volumes. These data are used to update the countywide database of observed traffic conditions in order to verify relationships and parameters included in the CMP model.

Land Use Trip Assumptions — As part of the Land Use Impact Analysis Program, Member Agencies provide a summary of approved projects and major planning decisions, such as General Plan Amendments, made during the past year. Annual data for the Land Use Impact Analysis Program is submitted in terms of housing and development square feet by use. This data is used by the CMP to develop population and employment changes for use in refining at a more local level the socioeconomic data allocations ABAG provides at the census tract level. VTA also uses parcel data purchased from private companies to verify the base year 2010 and 2013 land use data employment values, based on application of job rates to development square footage by land use classification.

REGIONAL DATABASE AND MODELING UPDATES

CMP Statute requires that the CMP model remain consistent with the ABAG regional database and MTC model. To achieve this, the CMP model is updated on an on-going basis to remain consistent with the regional database and model. Six specific update efforts are described below.

Santa Clara County Land Use Database — To facilitate future planning, Member Agencies and VTA staff have developed an independent, locally generated, and managed land use database. This database will provide information for use in the CMP as well as help to make future ABAG projections more accurate. The database was initialized from parcel data obtained from the Santa Clara County Assessor, and will be improved as Member Agencies verify their existing land use data and as approved projects are added as part of annual land use data submittals.

As Member Agencies complete their verification, the land use database will represent the most accurate, consistent database for current and near-term land use. The database will assist ABAG by providing accurate inputs to floor area, housing, and acreage inventories for their projections. This database is available in the CMP's Geographic Information System (GIS). VTA has recently updated the model databases to reflect the recently adopted ABAG P 2013 data sets.

2010 Census Data Analysis —The Census Bureau, through the American Community Survey, has released 2010 data that was used to update the CMP models for auto ownership, trip distribution and mode choice. VTA has recently recalibrated the CMP models to reflect data from the 2010 Census and American Community Survey.

MTC Transportation Model Changes — MTC periodically issues data, analysis, and projections of information pertinent to the CMP model and assumptions, such as projections of pricing assumptions such as auto operating costs and parking costs. The CMP model and database are

modified as needed to remain consistent with those developed by MTC for its model system, which are typically distributed when the MTC Regional Transportation Plan in updated.

ABAG Data and Projections — — The most recent ABAG projections, P2013, has been updated and incorporated into the CMP model databases.

Parking Facilities and Pricing Inventory — MTC maintains an inventory of peak and off-peak parking charges at the zone level. A current and complete inventory of parking facilities and pricing is required for the internal zone system for the CMP model. The CMP model is consistent with the most recent MTC parking charges used in the RTP 2040 update, Plan Bay Area.

GEOGRAPHIC INFORMATION SYSTEMS MAINTENANCE

VTA maintains model database information in Geographic Information System (GIS) layers, or coverages. Layer information includes roadway and transit networks, bus stop and transit station locations, land-use information including parcel level data, General Plan information, key production and attraction features such as schools, shopping centers, government offices, major employers and employment centers, parks, water features, and open spaces. These GIS layers are periodically updated and refined.

COMPLIANCE AND CONFORMANCE

To be in conformance with the Congestion Management Program, Member Agencies must ensure that their models are consistent with the CMP model using the CMP Local Model Consistency Guidelines. VTA encourages the use of the CMP model by the local Member Agencies in order to ensure consistency, however, member agencies are free to develop their own local models but will be required to produce documentation to demonstrate consistency with the CMP models.

VTA must also ensure that the CMP models are consistent with the MTC regional models. To demonstrate compliance and conformance, MTC has developed a checklist of outputs that are to be produced from the CMP models and compared to a comparable MTC regional forecast year model run. CMP has prepared the checklist outputs from the most recent 2040 model runs and will provide the results in a separate submittal to MTC.

CHAPTER 7 | LAND USE IMPACT ANALYSIS ELEMENT

This chapter describes VTA's CMP Land Use Impact Analysis Program. The chapter includes the following sections:

- Statutory Requirement and VTA Policy
- Development of the CMP Land Use program
- Elements of the CMP Land Use Program
    - Development Review Program
    - Land Use and Transportation Integration Partnerships
    - Community Design and Transportation (CDT) Program
    - CMP Land Use Database
- Other VTA Activities Related to Land Use
    - VTA Activities Related to Energy and Air Quality
    - Joint Development Program
- Relationship to Regional Initiatives
    - Priority Development Area (PDA) Investment & Growth Strategy
    - Plan Bay Area and SB 375
    - MTC Resolution 3434 TOD Policy
    - AB 1358 – Complete Streets Act
- Compliance and Conformance

STATUTORY REQUIREMENT AND VTA POLICY

An underlying reason for merging the Santa Clara County Transit Agency and the Santa Clara County Congestion Management Agency and creating VTA was to better integrate land-use and transportation decision-making. Both the Transit Agency and the Congestion Management Agency were engaged in various land use and transportation integration efforts, and it was intended that these efforts be enhanced under a combined agency. This emphasis continues to the present, as one of the business themes of VTA's 2017-2022 Strategic Plan includes the integration of transportation and land use.

The CMP statute (California Government Code: 65089 (b) (4)) requires that the CMP include:

"A program to analyze the impacts of land use decisions made by local jurisdictions on the regional transportation system, including an estimate of the costs associated with mitigating those impacts."

The Santa Clara County CMA Governing Board discussed the land use impact analysis program requirement of the CMP Statute in detail during development of the 1991 CMP. It realized that the effective integration of land use and transportation had to occur on multiple levels, and that an advocacy role was also needed to influence policy development and community form. The Governing Board adopted a two-stage approach to the land use program. These stages were:

Stage I — Member Agencies utilize a consistent methodology for evaluating the impact of specific development projects on the CMP System and submit a summary of all specific projects approved to the agency as part of the CMP's annual monitoring process; the agency adds approved development projects to the countywide model and performs a cumulative transportation analysis for informational purposes.

Stage II — State law (AB 1619) vests the entity responsible for the CMP with responsibility for that county's countywide transportation plan. As part of VTA's countywide long-range transportation planning process, VTA and its Member Agencies developed land use policies and called for the creation of a new program to influence land use polices and provide incentives for planning future growth in a manner that minimizes the potential negative impacts of development on the countywide transportation system. As a result, the Community Design and Transportation (CDT) Program was created and adopted by the VTA Board of Directors in 2002 as its primary program for integrating transportation and land use. By 2004, all Member Agencies had endorsed the program through formal Council/Board Actions.

The CDT Program includes a comprehensive toolkit for Member Agencies to use in all aspects of transportation and land-use planning, and in developing both public and private development projects. It includes a foundation of key concepts, guiding principles, and specific practices and actions that Member Agencies can use to improve community form and the operation of the transportation systems.

The Stage I Land Use Impact Analysis Program was initiated as part of the 1991 CMP. The Stage II Land Use Program was developed as part of the Valley Transportation Plan 2020 adopted in 2000, and was augmented with the VTA Board adoption of the CDT Program in November 2002. Subsequent updates to VTP have continued to emphasize the importance of the CDT Program.

DEVELOPMENT OF THE CMP LAND USE PROGRAM

The CMP statute clearly intends that local jurisdictions retain their legal authority to make land-use decisions. However, the Statute also makes cities and counties more accountable for the impacts that their land use decisions have on transportation facilities than they have been in the past, both within and outside their boundaries.

Under the CMP Statute, local land use decisions may not degrade Auto Level-of-Service (LOS) below the adopted standard for VTA's CMP Roadway Network (LOS E). If a LOS standard violation is found during the monitoring process, the Member Agency within whose boundaries the violation occurs will be responsible for taking corrective actions or the Member Agency could be found in nonconformance with the CMP.

One potential problem with a strict interpretation of the CMP Statute is that it could encourage new development in outlying areas where there are large tracts of undeveloped land, and where the transportation system is relatively underutilized; that is, where LOS violations are least likely to occur and the impacts of development can be absorbed without triggering mitigation measures. This interpretation of the CMP Statute could be problematic for cities working carefully to manage urban development by encouraging infill development and reducing sprawl. Recognizing this as a potential impediment for focusing growth and infill development in major transportation corridors and cores, the State Legislature has amended the CMP statutes to allow the preparation of Deficiency Plans (called Multimodal Improvement Plans in the VTA CMP) and designation of Infill Opportunity Zones (IOZs).

The VTA CMP continues to promote the increased use of alternative transportation modes, such as transit, bicycling, and walking. In addition to encouraging infill housing and employment growth, transit-oriented development, and mixed-use development in core areas and around major transit facilities it promotes the removal of regulatory barriers. It also underscores the need to balance level of service standards for traffic with the need to build infill, transit-oriented and mixed-use developments within walking distance of transit facilities, downtowns, and town centers. The VTA CMP seeks to give greater flexibility to local governments to balance these sometimes competing needs.

LONG-RANGE OBJECTIVES

The long-term objective of the CMP Land Use Element is to develop land use and transportation initiatives that improve transportation conditions, community livability, and air quality—including the reduction of greenhouse gas emissions—while supporting community goals. For example, many of Santa Clara County's larger cities have relatively mature commercial and residential centers. In these cities, the planning emphasis has shifted from new land development to planning for balanced development within already developed centers – a form of urban revitalization.

These cities are pursuing programs of infill, adaptive-reuse, renewal, mixed-use development, and increasing their density and housing supply. This is often occurring in areas that were formerly devoted to low-density industry.

Smaller and less intensively developed cities may have different planning goals than the larger cities. However, these smaller cities are equally interested in planning objectives that ensure appropriate development, maximize the use of transportation investments and, to the extent possible, prevent unwanted traffic.

In addition to specific land-use planning efforts, VTA, the County and some cities have aggressively pursued and built new transportation facilities that could have a major impact on land-use plans. For example, the light rail system and the Caltrain line offer excellent opportunities for new transit-oriented mixed-use development. VTA is also in the process of bringing BART service to Santa Clara County, which will provide additional opportunities for transit-oriented development. In the long run, transit-oriented development projects in these transit corridors can be expected to optimize the overall benefit of transportation investments.

Application of the CMP Statute in Santa Clara County must recognize the importance of these new land use and transportation initiatives (urban revitalization and transit oriented development) and encourage these initiatives in the future. The long-range (25-year) transportation plan for Santa Clara County, Valley Transportation Plan (VTP) 2040 prepared by VTA, reaffirms VTA's commitments to land use programs and investment strategies. The CDT Program is an integral part of this plan, and land use and transportation integration will remain a key component in future updates of the long-range transportation plan for Santa Clara County.

VTP 2040's objective for integrating transportation and land use through the CDT Program includes the following aspects:

- Designing and managing the transportation system to support concentrated development in selected locations
- Reducing energy use and greenhouse gas emissions
- Providing connectivity in road, bike and pedestrian networks so travelers can choose among many routes and modes
- Using land efficiently and supporting concentrated development with strategies including land use intensification and reuse, transportation investments that minimize right-of-way requirements and limiting land area dedicated to surface parking
- Developing an urban vision that creates sense of place, human scale buildings, vibrant public spaces and as many activities as possible within easy walking distance of each other and transit stops

- Promoting street design standards that consider function and land use context, and providing interconnected multimodal options
- Supporting investments concentrated within the CDT Program's Cores, Corridors, and Station Areas
- Promoting robust partnerships with member and regional agencies

RESEARCH EVIDENCE ON THE IMPORTANCE OF CONCENTRATED DEVELOPMENT AROUND TRANSIT

Recent research at the national, state and local level has demonstrated the transportation benefits of concentrated development near transit. The following is a brief snapshot of key highlights of this research relevant to VTA's efforts in these areas.

On the residential side, a 2008 Transit Cooperative Research Program study (TCRP Report 128) noted transit-oriented development (TOD) households typically own fewer cars because they have smaller households and because they may forgo extra cars due to transit's proximity. The study found that TOD households are also almost twice as likely to not own a car, and own almost half the number of cars of other households. In addition, over a typical weekday period, the study found that 17 surveyed TOD housing projects averaged considerably fewer vehicle trips than estimated by the Institute of Transportation Engineers manual.[1] A study by researchers at the University of California Transportation Center (UCTC) in 2009 looked at parking supply versus demand at 31 multi-family housing projects near rail transit stations in the East Bay and the Portland, Oregon region, and found that parking supply exceeded demand by 25% in the East Bay and 30% in Metro Portland.[2] And a collaborative research project conducted by San Jose State University and VTA in 2010 indicated that residential TOD properties near rail stations in Santa Clara County may be 'over-parked', with supply exceeding demand by more than 20 percent on average.[3]

On the employment side, the literature review included in TCRP Report 128 notes that the location of jobs accessible by transit influences transit ridership. The report notes that "Systems that generate the highest commute ridership have a high percentage of regional jobs accessible by fast transit. For work trips, proximity to rail stations is a stronger influence on transit use than land

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1 Transit Cooperative Research Program (TCRP) Report 128: *Effects of TOD on Housing, Parking and Travel, 2008* (available at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_128.pdf)

2 Robert Cervero, Arlie Adkins and Cathleen Sullivan, *Are TOD sites Over-Parked?*, University of California Transportation Center (UCTC) Research Paper No. 882, 2009 (available at http://www.uctc.net/research/papers/882.pdf)

3 San Jose State University and Santa Clara Valley Transportation Authority, A Parking Utilization Survey of Transit-Oriented Development Residential Properties in Santa Clara County, November 2010 (available at http://www.sjsu.edu/urbanplanning/docs/VTA-TODParkingSurveyReport-Vol1.pdf)

use mix or quality of walking environment. Thus, the most effective strategy to increase TOD ridership is to increase development densities in close proximity to transit. Employment densities at trip ends have more influence on ridership than population densities at trip origins. It is critical to locate jobs near transit in order to attract households to TODs."[4]

ELEMENTS OF THE CMP LAND USE PROGRAM

The Land Use Impact Analysis Program was implemented as part of the 1991 CMP, was modified in 1997, and has been augmented with the development of the Community Design and Transportation Program. Member Agencies have complied with the requirements of the Land Use Impact Analysis Program annually from 1991 to the present.

DEVELOPMENT REVIEW PROGRAM

VTA's Development Review Program encompasses two separate, yet interrelated efforts to review and comment on development and transportation projects occurring in and adjacent to Santa Clara County: 1) the review of environmental documents and development proposals submitted by Member Agencies; and 2) the review of Transportation Impact Analysis (TIA) reports for proposed projects meeting the Congestion Management Program (CMP) TIA Guideline requirements.

The objectives of the Development Review Program include improving land use/transportation coordination, promoting alternative travel modes, and encouraging a balanced approach to addressing congestion.

There are three tracks under which development review occurs:

1. Projects that require a Transportation Impact Analysis (TIA) Report per CMP guidelines, but do not require environmental clearance. For this type of project, VTA may receive a stand-alone TIA from a member agency, and the review requirements are defined by VTA Congestion Management Program standards.
2. Projects undergoing environmental clearance per the California Environmental Quality Act (CEQA). For this type of project, the public notification and review requirements are defined by the CEQA as well as member agency and VTA standards. A TIA is typically prepared during the environmental process, and the environmental document usually includes the TIA as an appendix.
3. Additional referrals sent to VTA at the discretion of the Member Agency, such as a site plan review or an administrative draft of a planning document. For these referrals, the process and deadlines are established by agreement between VTA and Member Agency staff.

4 TCRP Report 128.

VTA staff prepares a quarterly report summarizing Member Agency projects that are submitted to VTA for review, comments submitted to Member Agencies by VTA staff, as well as projects that VTA previously commented on which were approved during the past quarter and any responses to VTA comments or conditions of approval related to transportation.

2014 TIA Guidelines Update and Relationship to Development Review

VTA requires that Member Agencies analyze the potential transportation impacts of their land use decisions on the CMP System using the Transportation Impact Analysis (TIA) Guidelines adopted by the VTA Board of Directors for all development projects that generate 100 or more net new A.M. or P.M. peak-hour trips. As part of these analyses, Member Agencies must evaluate project impacts and effects on the multimodal transportation, including roadways, transit, and pedestrian and bicycle facilities.

Over the 2012-2014 timeframe, VTA engaged in a comprehensive update of the TIA Guidelines document in response to a number of trends and changes affecting transportation and land use planning in the county and statewide:

- Progress on implementation of Senate Bill (SB) 375 and the Sustainable Communities Strategy with the corresponding emphasis on reductions in automobile trips and Vehicle-Miles-Traveled (VMT) (see “Relationship to Regional Initiatives” below);
- The 2010 updates to the California Environmental Quality Act (CEQA) Transportation checklist, which allowed agencies more flexibility in determining how to perform transportation analysis;
- The release of the 2010 Highway Capacity Manual (HCM), including new Multimodal Level of Service measures (see discussion in Chapter 4);
- Additional emphasis on Complete Streets policies in General Plan Circulation Elements (see “Relationship to Regional Initiatives” below);
- A trend for major development projects in Santa Clara County to pursue aggressive reductions in automobile trip generation (see Chapter 5).

VTA staff began this update process by identifying goals and desired outcomes as well as key areas to address, and gathering input on these topics from VTA’s Member Agencies and other stakeholders. VTA conducted an extensive outreach process of over two years incorporating input from:

- Transportation/engineering and planning staff through the Systems Operations & Management (SOM) and Land Use / Transportation Integration (LUTI) Working Groups of the VTA Technical Advisory Committee (TAC);

- An ad hoc TIA Guidelines Update Technical Working Group (TWG) consisting of Member Agency and Caltrans representatives, who provided input through two web surveys and three in-depth meetings in October 2013, January 2014, and April 2014;
- VTA Advisory Committees and the Congestion Management Program and Planning Committee (CMPP);
- Advocacy, business, development, and policy groups active in Santa Clara County; and
- Major transportation and environmental consulting firms who work in Santa Clara County.

Two of the most important goals of the TIA Guidelines Update were to 1) Emphasize the reduction of automobile trips, and 2) Improve the analysis of alternative modes.

To address the first goal, the updated TIA Guidelines include a new requirement to include a 2-page Auto Trip Reduction Statement (ATRS) at the beginning of each TIA to highlight measures by the project to reduce auto trips, in a format easy to read and understand for decision-makers and the public. VTA also added new options for projects to document trip reductions, including Target-Based Reductions for projects that establish a TDM program with a target for auto trip reduction, monitoring and enforcement; and Peer/Study-Based Reductions when studies of similar projects or similar sites occupied by the project applicant demonstrate comparable trip reductions through survey results or other data.

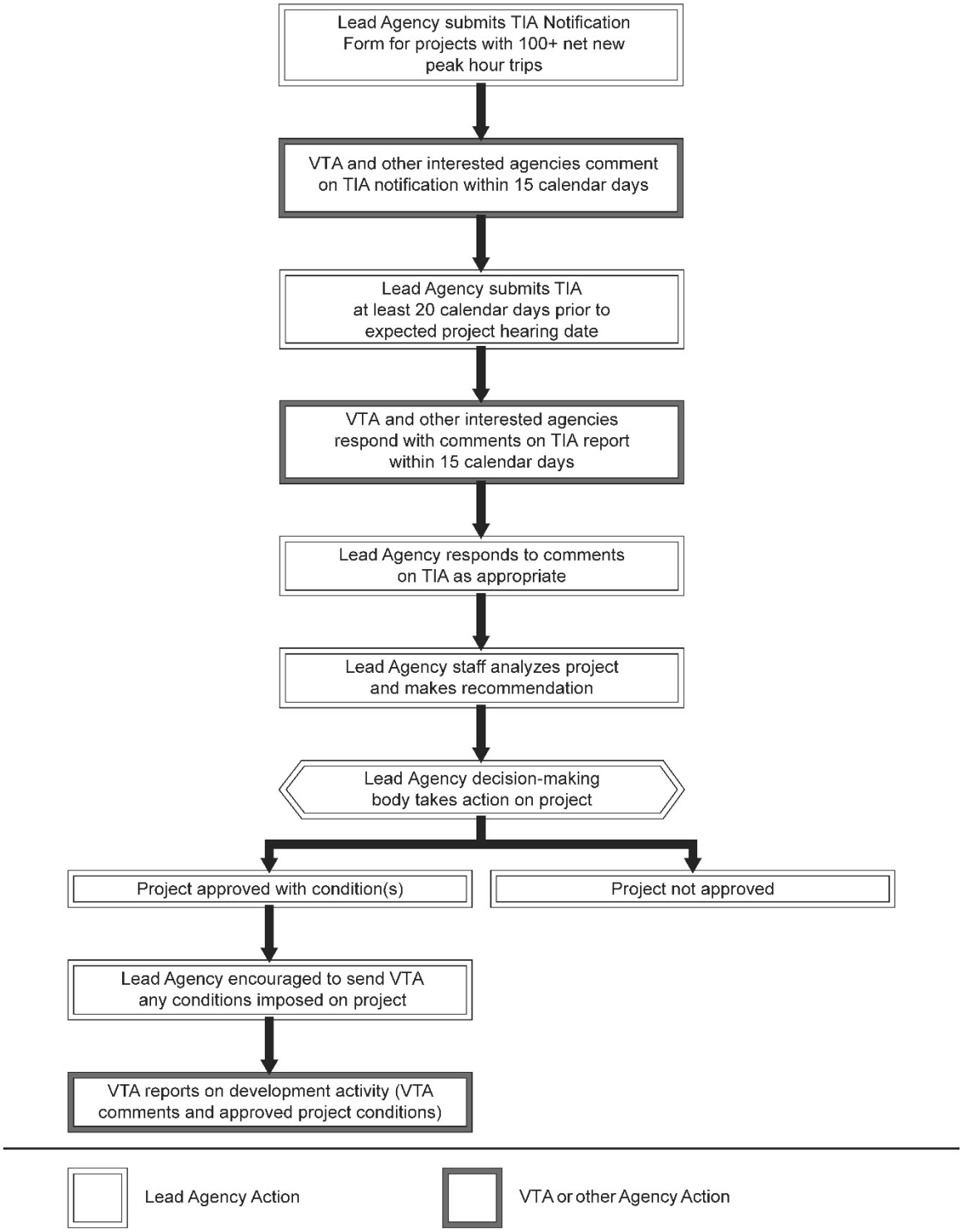
To address the second goal, VTA updated the requirements for pedestrian, bicycle and transit modes to remove the requirement to analyze demand and capacity except for projects that generate unusually large numbers of trips on these modes. For pedestrian and bicycle analyses, the updated TIA Guidelines shift to a Quality of Service (QOS)-based approach, with the specific methodology at the discretion of the Lead Agency. For transit analysis, the updated TIA Guidelines focus on transit delay and transit access/facilities. See Chapter 4 for more information on Pedestrian/Bicycle QOS and Transit Delay as Multimodal Performance Measures.

The CMP TIA Notification and Review Process is illustrated by the flow chart in Figure 7.1. The complete process is described in the CMP TIA Guidelines.

LAND USE AND TRANSPORTATION INTEGRATION (LUTI) PARTNERSHIPS PROGRAM

VTA initiated the Land Use and Transportation Integration (LUTI) Partnerships Program in response to a series of discussions with VTA Advisory Committees, the Congestion Management Program and Planning Committee (CMPP) and the Board of Directors in 2014. The purpose of

FIGURE 7.1 | TRANSPORTATION IMPACT ANALYSIS (TIA) NOTIFICATION AND REVIEW PROCESS



the program is to build on existing VTA initiatives to enhance VTA's involvement in land use decision-making. A key objective is to create opportunities for VTA and Member Agencies to work together earlier in the process of planning and development to produce more effective and meaningful collaborative outcomes. This relationship is mutually beneficial; VTA's transportation investments greatly influence many aspects of city livability and sustainability, and the local land use decisions influence the effectiveness of the various types of travel (e.g., car, walk, bike, and transit) - and both efforts attain greater value working together through each phase of development.

VTA staff offers three broad categories of outreach and assistance to Member Agencies:

- Knowledge-building: trainings, blog series, policy discussions;
- Research: development tracking and reporting on trends;
- Technical assistance: providing project-based expertise on land use, urban design, and transportation issues.

Beginning in late 2015, VTA began highlighting major areas of development throughout the county at presentations to VTA Committees and the Board, in collaboration with Member Agency staff. A key component of this effort is to identify transportation solutions to address the cumulative impacts and effects of growth on the multimodal transportation system, ultimately feeding back into VTA's long-range transportation planning efforts.

COMMUNITY DESIGN AND TRANSPORTATION (CDT) PROGRAM

The Community Design and Transportation (CDT) Program was developed to provide a unified framework for VTA's various land use activities. In 2002, the VTA Board of Directors adopted the CDT Program as its primary program to integrate transportation and land use, and adopted the *CDT Manual of Best Practices for Integrating Transportation and Land Use*. Within the next two years, every VTA Member Agency formally endorsed the CDT Program through Board or Council action, pledging to work to implement the guidelines laid out in the CDT Manual in future development. One key element of the CDT Program is the Cores, Corridors and Station Areas (CCSA) framework, which shows VTA and Member Agency priorities for supporting concentrated development in the County. The CCSA framework continues to play an important role in VTA land use activities such as the Development Review Program and VTA's participation in regional initiatives such as Plan Bay Area and the PDA Investment & Growth Strategy (see below for more details about these programs).

The CDT Program has several purposes, including providing a framework where VTA can:

- Influence the design and programming of developments as early as possible in the development process.
- Enhance the effectiveness and efficiency of VTA projects
- Be an advocate for planning and design practices that enhance community livability
- Encourage an increase in non-greenhouse gas-emitting mode shares
- Assist local jurisdictions with planning and developing projects
- Foster joint planning and project development efforts, have more meaningful interaction and coordination with cities and the county regarding land use policy
- Provide leadership through policy, planning, design, and technical innovations
- Assist member agencies with planning, design, research, education and outreach involving the interactions between transportation systems, land use and urban design
- Foster a favorable policy setting to assist decision-makers with supporting the CDT Program, and provide a venue for improved dialogue and partnerships with all stakeholders.

Partnerships and cooperation are fundamental requirements for the long-term effectiveness of the program. To be successful, the CDT Program will work to keep all stakeholders—VTA, member agencies, developers, the business community, and the public—focused on the cumulative benefits of implementing best practices. While immediate payoff opportunities may occasionally surface, incorporating CDT best practices within each new project and implementing incremental changes continually over time will yield the greatest returns. This requires active commitment from both member agencies and VTA.

VTA intends to update the CDT Manual over the coming years to reflect the most recent research and best practices in integrating transportation and land use. This effort will be undertaken in partnership with Member Agencies and other VTA stakeholders to ensure that the program is as useful and effective as possible.

CMP LAND USE DATABASE

One of the most critical aspects of the Land Use Program is gathering information on existing and planned land uses throughout the county. VTA maintains a uniform database of planning-level land use information, which was developed from 1997 to 1999 and is revised annually by Member Agencies as part of the annual CMP monitoring process.

In addition, the CMP land use database assists Member Agencies in their efforts to revise land use forecasts produced at the regional level. These regional forecasts are used in the MTC's Regional Transportation Model and must be used in the CMP countywide transportation model (according to the CMP statute). The CMP land use database structure has been designed to be consistent with the regional agency database in order to facilitate improved information exchange.

Hence, in order to maintain the land use database, the second requirement of the Land Use Impact Analysis Program is that Member Agencies provide VTA with data on two categories of land use decisions:

Approved Projects – Site-specific land use actions that have a sponsor and that have been approved for development according to a defined schedule; and

Major Land Use Planning Changes – Changes in general land use designations for which project-level approval decisions will be required before any construction can begin. Major land use planning decisions include General Plan Amendments, specific plans, area plans, and major zoning revisions.

OTHER VTA PROGRAMS AND INITIATIVES RELATED TO LAND USE

VTA ACTIVITIES RELATED TO ENERGY AND AIR QUALITY

Through partnerships between VTA and its partner agencies, VTA has initiated several activities to support the conservation of natural resources, reduction of greenhouse gases, prevention of pollution and use of renewable energy and materials. These activities also support existing legislative mandates such as AB 32 and SB 375.

Principles that inform VTA's approach to energy and air quality include:

- Look toward existing and new technology for applications in VTA operations
- Place high emphasis on demand for fuel efficient and alternative fuel vehicles
- Encourage private and public organizations to pursue green actions
- Support the development of locally produced green energy sources

VTA's activities in these areas include:

- Proactively implementing VTA's Sustainability Program
- Exploring support from private sector development through its capital and on-going operating programs

- Supporting regional and local advocacy efforts related to land use and transportation integration
- Improving transit by focusing on key corridors where local jurisdictions are committed to land use intensification and on first/last mile connections
- Supporting State and local building codes that require LEED certified construction such as insulation, energy efficient design and passive and active solar design elements

VTA JOINT DEVELOPMENT PROGRAM

VTA envisions its station areas and transit corridors as vibrant, prosperous community assets that create a strong sense of place for transit, pedestrians, and the surrounding community, and are destinations in their own right.

VTA's Joint Development Program furthers the VTP land use goal and objectives as well as the objectives of the CDT Program. The program was adopted by the VTA Board in January 2005 and is designed to secure the most appropriate private and public sector development of VTA-owned property at or adjacent to transit stations and corridors. The VTA Board of Directors adopted a revised Joint Development Policy and Implementation Plan in April 2009. The revised Joint Development Policy provides the appropriate framework to maximize the respective economic values of each real estate asset through consensus-driven, site-appropriate development that also increases transit ridership, creates vibrant community assets and enhances the long-term life of VTA's facilities.

The Joint Development Policy provides a framework for creating and pursuing the highest and best opportunities for development around station areas and corridors. The policy is intended to establish guidelines and procedures for identifying such opportunities to optimize return on investment to VTA. VTA's efforts related to Joint Development also include coordination with local jurisdictions in station area land use planning to establish development patterns that enhance transit use.

RELATIONSHIP TO REGIONAL INITIATIVES

VTA's efforts regarding land use and transportation integration work together with and reinforce initiatives that are occurring at the regional level in the San Francisco Bay Area.

PRIORITY DEVELOPMENT AREA (PDA) INVESTMENT & GROWTH STRATEGY

To encourage a shift towards higher density growth patterns, protect the environment, reduce vehicle miles traveled, and encourage investment in transit, ABAG, along with BAAQMD, MTC, and the Bay Conservation and Development Commission (BCDC) established the FOCUS Program in 2006 and 2007. FOCUS established Priority Development Areas (PDAs) with

incentives for transit oriented development and provided a bridge between local land use decisions and regional development. As part of the update of the Bay Area's Regional Transportation Plan, MTC and ABAG initiated the Priority Development Area (PDA) Investment & Growth Strategy as the successor to FOCUS. Over the past several years, VTA has been working with its Member Agencies, advocacy groups and other interested parties to craft a PDA Investment & Growth Strategy that will be a useful tool to identify needs and resources for the PDAs and allow cities to target improvements to these areas. The most recent report was completed in summer 2017 and was adopted by the VTA Board of Directors in September 2017.

On May 17, 2012, MTC and ABAG adopted the One Bay Area Grant (OBAG) program to distribute federal funds for transportation projects. As part of OBAG, MTC and ABAG adopted general programming policies for the distribution of funds, including a requirement that at least 70% of OBAG investments be directed to PDAs for projects located either in, or serving the PDAs. For future grant cycles, funding may be distributed to those local agencies that have PDAs. With each new round of OBAG funding, VTA will work with its partners to produce a PDA Investment & Growth Strategy Report that will highlight these needs and identify the resources required to address growth.

Through the CDT Program, which preceded FOCUS and the PDA Investment & Growth Strategy, VTA and its member agencies have already made a commitment to developing communities that have focused development served by transit. While several good examples of this type of development have been built in Santa Clara County and more are currently under construction, much work remains to be done. The coming updates of the CDT Manual will assist Member Agencies in these efforts. The majority of areas in the CDT Program Cores, Corridors, and Station Areas framework are included as PDAs in the PDA Investment & Growth Strategy, and some Santa Clara County cities have had other areas designated as PDAs. These locations will be supported by technical and financial assistance from both ABAG and MTC to help plan and develop into complete communities based on the goals of transit connectivity, housing availability and economic vitality.

PLAN BAY AREA AND SB 375

In July 2013, MTC and ABAG adopted 'Plan Bay Area,' which includes the region's Sustainable Communities Strategy and 2040 Regional Transportation Plan. Plan Bay Area marks the Bay Area's first long-range transportation plan to meet the requirements of California's 2008 Senate Bill 375 (Steinberg), which requires each of the State's 18 metropolitan areas to reduce greenhouse gas (GHG) emissions from cars and light trucks. Under SB 375 each region must develop a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) that promotes compact, mixed-use commercial and residential development that is walkable and

bikeable and close to mass transit, jobs, schools, shopping, parks, recreation and other amenities.

The land use distribution of Plan Bay Area was developed to meet performance targets based on SB 375:

- Help the region achieve its GHG emissions reduction target of reducing per-capita CO2 emissions from cars and light-duty trucks by 7 percent by 2020 and by 15 percent by 2035; and
- House 100 percent of the region's projected 25-year population growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents.

To help achieve these goals, the 2013 Plan Bay Area envisions 80% of all new housing and 66% of all new jobs to be located in PDAs. In July 2017, the regional agencies adopted an updated RTP/SCS, Plan Bay Area 2040, which continues to emphasize concentrated housing and job growth in PDAs.

VTA, as the Congestion Management Agency for Santa Clara County, was actively involved in the development of the SCS and the RTP and served as a liaison between the regional agencies and VTA's Member Agencies in these efforts. Through VTA's own initiatives including the CDT Program, Land Use Impact Analysis Program, and Joint Development Program, VTA has long supported the goal of integrating land use and transportation planning that the SCS and RTP strives to achieve. VTA is committed to supporting local and regional efforts intended to give people more transportation choices, create more livable communities and reduce energy consumption and the pollution that causes climate change.

MTC RESOLUTION 3434 – REGIONAL TRANSIT EXPANSION PROGRAM AND TOD POLICY

As part of the 2001 update to the Regional Transportation Plan (RTP), MTC developed an associated Regional Transit Expansion Program (RTEP) that identified a list of high-priority rail and express/rapid bus improvements to improve mobility and enhance connectivity throughout the Bay Area. MTC adopted a Transportation and Land Use Platform that calls for supportive land use plans and policies to support transit expansions in Resolution 3434. In 2005, MTC amended Resolution 3434 to include a Transit-Oriented Development Policy that establishes specific housing thresholds for these transit extensions, requires station area plans, and establishes corridor working groups.

One transit extension project in Santa Clara County is identified in the MTC Resolution 3434 TOD Policy – the BART extension from Fremont to San Jose/Santa Clara. The TOD Policy calls for a minimum threshold of 3,850 housing units per station area, averaged for the corridor starting from the existing end station (Fremont) to the end of the extension (Santa Clara). The TOD

Policy specifies that to meet the corridor level thresholds, within a half mile of all stations a combination of existing and planned land uses must meet or exceed the overall corridor threshold for housing. New below-market housing units will receive a 50 percent bonus toward meeting the corridor threshold (i.e., one planned below-market housing unit counts for 1.5 housing units for the purposes of meeting the corridor threshold).[5]

VTA, as the sponsor for the BART extension project to Milpitas, San Jose, and Santa Clara, is actively working with the cities along the corridor and other stakeholders to plan for future housing and employment intensification, station access needs, pedestrian- and bicycle-friendly design, and infrastructure improvements in the vicinity of the six stations in the BART Silicon Valley extension. As of 2017, station area planning efforts have been completed for Milpitas Station, Santa Clara Station, and Diridon Station in San Jose. Planning efforts are also ongoing for the Berryessa Station and the Alum Rock Station in San Jose, involving coordination between VTA, the City of San Jose, CommUniverCity, San Jose State University, several neighborhood associations, and local land owners. VTA is also initiating a BART Phase II Transit-Oriented Development Strategy Study to develop updated and implementation-focused TOD strategies for the Alum Rock, Downtown San Jose, and Santa Clara Stations.

AB 1358 - COMPLETE STREETS ACT

The California Complete Streets Act of 2008 requires counties and cities making revisions to the circulation element of their general plans from January 2011 onward to plan for a balanced, multimodal transportation network that meets the needs of all users of the roadways. These users include bicyclists, pedestrians, motorists and persons of all ages and abilities. The intent of Complete Streets is to provide multimodal networks that are safe, convenient and well maintained with the goals of reducing greenhouse gas emissions and vehicle miles traveled and improving public health.

VTA and its member agencies support this initiative and VTA is currently working on a variety of Complete Streets efforts that will complement the update of the CDT Program. These efforts will assist member agencies in planning, designing and implementing projects that include the following key elements:

- Multimodal design – Incorporating street designs that accommodates all travel modes where appropriate
- Capacity/Continuity – Maximizing efficient use of the roadway and implementing consistent street designs on corridors that travel through multiple cites
- Technology – Using technology to improve safety and roadway operations

[5] MTC Regional Transit Expansion Program of Projects (MTC Resolution 3434) TOD Policy, July 27, 2005, Attachment D-2.

- Connectivity – Improving access for all transportation modes to major destinations
- Maintenance – Including plans for preserving the multimodal networks

As a part of VTA's Complete Streets efforts, VTA is currently leading three Complete Streets corridor studies in coordination with member agencies, along the Story-Keyes, Tasman, and Bascom corridors.

COMPLIANCE AND CONFORMANCE

Member Agencies provide data to VTA annually in the CMP Monitoring Report following the process described in the CMP Monitoring and Conformance Requirements. The data provided includes all approved development projects and major land use planning changes made during the past year. This data is used to update the CMP countywide transportation model. In order to conform to the CMP, Member Agencies must submit the Annual Land Use Monitoring Report to VTA for the year ending June 30, by December 1 of each year.

When VTA's cumulative analysis of all approved projects produces a finding of potential nonconformance caused by project-related trips on the CMP System, the Member Agency or Agencies will be advised that nonconformance – the actual violation of Auto LOS Standards on an intersection or road segment of the CMP System – is imminent. Under those circumstances, the Member Agencies may be required to identify strategies to maintain conformance. These strategies will affect projects that have not yet been approved that could further degrade the LOS on the same intersection or road segment. Member Agencies may propose to add mitigation measures, to defer approvals, or to prepare Multimodal Improvement Plans that contain system-wide or multimodal improvements.

If the analysis of a land use planning decision shows that the proposed land use changes may contribute to a future violation of Auto LOS standards, subsequent reports must demonstrate that future land use plans and/or transportation improvements will prevent LOS violations, or that an approved Multimodal Improvement Plan will be applied to achieve systemwide improvements.

CHAPTER 8 | CAPITAL IMPROVEMENT PROGRAM

This chapter describes Santa Clara County's CMP Capital Improvement Program (CIP). It contains the following sections:

- Introduction
- Capital Improvement Program Funding
- CIP Project Lists

INTRODUCTION

The Capital Improvement Program (CIP) is a list of capital projects designed to improve transportation conditions and air quality in Santa Clara County. The CIP describes major transportation projects proposed by Member Agencies and Caltrans and includes projects funded by a variety of funding sources. The CIP does not include transit projects funded solely through Federal Transit Administration (FTA) formula funds (Sections 5307 and 5309) or Transportation Development Act (TDA) Sections 4 and 4.5 funds. These projects are included in the VTA, Caltrain and ACE Short Range Transit Plans (SRTPs).

The CMP statute requires that the CMP contain a Capital Improvement Program that accomplishes the following objectives:

- Maintains or improves the performance of the multimodal system for the movement of people and goods.
- Mitigates the impacts of land use decisions on the Regional Transportation System.
- Conforms to air quality mitigation measures included in state and federal air quality plans.
- Preserves the investment in existing facilities.

LOCAL POLICIES FOR CIP DEVELOPMENT

In 1992, the Santa Clara County CMA Governing Board adopted several specific policies (in addition to the statutory requirements for CIP projects) to guide the development of the Capital Improvement Program. These policies were used in conjunction with the regional criteria for project selection and other program-specific criteria to develop the CIP. The VTA Board of Directors revised these policies as a result of the November 2001 election and January 2009 adoption of its long-range Countywide Transportation Plan, Valley Transportation Plan 2035 (VTP 2035). They are listed as follows:

- Future discretionary Federal and State programming is limited to pedestrian, bicycle and roadway projects (Adopted October 5, 2000).

- Santa Clara County's STIP submittal will be formulated to be consistent with the adopted long-range Countywide Transportation Plan.
- Project sponsors in Santa Clara County will provide at least twenty percent of total project cost in local matching funds where appropriate.
- All projects submitted for funding must be on or benefit the adopted CMP System.
- Transportation improvements should support higher density development around transit stations, thus promoting the use of transit and other alternatives to the single-occupant vehicle in Santa Clara County.
- Improvements that make existing developments more pedestrian and bicycle-friendly, support HOV and transit users, and improve passenger safety and convenience are encouraged.
- Transportation improvements should support land-use policies that encourage well-designed infill and mixed-use development.
- Whenever possible, roadway projects shall improve, or at least not reduce, outside lane widths (or bicycle lanes) to provide for safe bicycle travel.

CAPITAL IMPROVEMENT PROGRAM FUNDING

The VTA Board adopted the Valley Transportation Plan 2040 (VTP 2040) in October 2014. VTP 2040 addresses transportation-related projects and actions in Santa Clara County that involve participation by VTA and its associated agencies, impact inter-jurisdictional travel, or are regional in nature. These investments are location-specific improvements for four modes of travel: roadway (including HOV and ITS), transit, bicycle, and pedestrian. The following sections describe funding programs for the 2017 CIP.

SURFACE TRANSPORTATION PROGRAM (STP) / CONGESTION MITIGATION - AIR QUALITY PROGRAM (CMAQ)

STP funds are used to address congestion problems by funding planning, rehabilitation and improvement projects across all transportation modes. CMAQ funds are used to implement the transportation provisions of the 1990 Federal Clean Air Act and are allocated only to areas designated as non-attainment areas. The Bay Area is currently a non-attainment area.

The STP and CMAQ funding programs are part of the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94). On December 4, 2015, President Obama signed this act into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public

transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs US DOT manages, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects.

REGIONAL IMPROVEMENT PROGRAM (RIP) AND INTERREGIONAL IMPROVEMENT PROGRAM (IIP)

Senate Bill 45 (SB-45) was signed into law in 1997. This legislation directed funds from the State Highway Account (SHA) into three funding categories:

1. Regional Improvement Program (RIP) – 75 percent
2. Interregional Improvement Program - Rural Interregional – 15 percent
3. Interregional Improvement Program - Discretionary – 10 percent

Seventy-five percent of the consolidated funds are allocated to the regions as Regional Improvement Program funds. The Metropolitan Transportation Commission (MTC) programs these funds through the State Transportation Improvement Program (STIP) process, with final approval by the California Transportation Commission (CTC).

The remaining 25 percent is allocated to the two categories of the Interregional Improvement Program (IIP). Fifteen percent is allocated to projects outside of the urbanized areas (IIP – 15 percent Category). The remaining 10 percent may be programmed on any interregional project at the discretion of Caltrans and CTC. All IIP funds are programmed by Caltrans, through the Interregional Transportation Improvement Plan (ITIP) process, with final approval by CTC. The regions may work with Caltrans for combined RIP and IIP funding of projects in the ITIP and/or petition for the nomination of particular projects in the ITIP. However, the ability to nominate projects for the ITIP rests solely with Caltrans. In the past, Caltrans has nominated and the CTC has programmed IIP funds to projects within Santa Clara County.

TRAFFIC CONGESTION RELIEF FUND

On July 6, 2000, the governor signed Assembly Bill 2928 into law. This bill established the Traffic Congestion Relief Fund (TCRF) to provide funding for specific congestion relieving transportation projects around the State. The bill made $914.5 million available for projects and to Santa Clara County; TRCF funding was prioritized for Prop. 42 funds until 2008, however Prop. 42 funds were diverted on multiple occasions and the prioritization period ended with a significant back-log of un-allocated funds. The CTC adopted a TCRP allocation plan in 2008 based on Prop. 42 payback schedules and tribal gaming receipts that were anticipated at the time, and prioritized the remaining projects into two tiers based on their delivery schedules.

The Prop. 42 payback revenues are directed to the first tier, with anything remaining in a given year, and the tribal gaming receipts directed to the second tier. VTA's BART extension project is in the first tier, and accounts for half of each year's guaranteed revenues until 2015. VTA received the final allocation in July 2015.

SENATE BILL 1

Senate Bill 1, the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017. This legislative package invests $54 billion over the next decade to fix roads, freeways and bridges in communities across California and puts more dollars toward transit and safety. These funds will be split equally between state and local investments.

2000 MEASURE A , 2008 MEASURE B , AND 2016 MEASURE B SALES TAX FUNDS

In November 2000, the voters of Santa Clara County approved Measure A, a 30-year countywide ½-cent sales tax to be collected by VTA and used to fund specific transit projects and programs. 2000 Measure A took effect in April 2006, immediately after the expiration of the 1996 Measure B ½-cent sales tax, and will continue for 30 years until 2036.
In November 2008, the voters of Santa Clara County approved Measure B, a 1/8–cent sales tax for the purpose of funding the operations and maintenance of the 16.1 mile BART extension into Santa Clara County and for providing VTA's contributions to BART's system wide capital reserve. The tax is limited to 30 years.

In November 2016, the voters of Santa Clara County approved Measure B. Revenues will fund various transportation projects in Santa Clara County. These projects range from local streets and roads repair, bicycle/pedestrian improvements, and building Caltrain grade separations to funding Phase II of the BART extension. Due to ongoing litigation, 2016 Measure B revenue is being held in an escrow account "until the legality of the tax is finally resolved by a final and non-appealable decision…" (California Revenue and Taxation Code, Rev. & Tax. Code § 7270(c).)

TRANSPORTATION FUND FOR CLEAN AIR

The Transportation Fund for Clean Air (TFCA) is generated by a $4.00 surcharge on vehicle registrations. The Bay Area Air Quality Management District (BAAQMD) administers these funds in the nine-county Bay Area. Funds are available for allocation to alternative fuels, arterial management, bicycle, and trip-reduction projects that reduce vehicle emissions.
BAAQMD returns 40% of these funds to the county in which they are collected for allocation by a "program manager." This fund is called the TFCA Program Manager Fund. VTA is the program manager for Santa Clara County and project sponsors apply directly to VTA for funding. The VTA Board of Directors allocates these funds to projects in Santa Clara County, following criteria developed by VTA and its Member Agencies and subject to approval by BAAQMD. The

remaining 60% of the funds are dedicated to a regional discretionary program managed directly by the BAAQMD.

SANTA CLARA COUNTY EXPRESS LANES REVENUE

In 2004, the State passed legislation (AB 2032, Dutra) giving VTA the authority to implement express lane operations in up to two routes in Santa Clara County. VTA completed an Express Lane Study that identified candidate routes, which are listed below as part of the Highway Program of projects.

In 2012, VTA opened the first express lane in Santa Clara County on the SR 237/I-880 connector ramp. During FY 2013, the express lane produced toll revenues of $1,049,000, exceeding the projection of $592,000, while the total expenses incurred were below projections at $535,000.

VTA estimates that express lane projects will generate approximately $1.01 billion in revenues (net of operating and maintenance expenses) through 2040 that will be used for transit services and other transportation improvements in the express lanes corridors.

2010 MEASURE B VEHICLE REGISTRATION FEE

In 2010 the voters of Santa Clara County approved a $10 increase in the motor vehicle registration fee for transportation-related projects and programs. Funds are distributed to the County of Santa Clara based on the County's percentage share of the total roadway lane mileage recorded in Caltrans' California Public Road Data report. The remaining funds are distributed to the incorporated cities within Santa Clara County based on each city's percentage share of the total county population as reported by the California Department of Finance. Roadway mileage and population shares are updated annually.

Eligible Project Categories include:

1. Pavement Rehabilitation/Reconstruction
2. Traffic Control Signals, Traveler Information & Safety Devices
3. Curb & Gutter Rehabilitation/Reconstruction
4. Roadway-Related Facilities to Improve Safety
5. Automobile-Related Environmental Mitigation including Roadway Sweeping & Litter Control
6. Intelligent Transportation System Technologies (transportation-related technologies including traffic control signals, safety and traveler information systems)

7. Countywide Environmental Mitigation related to pollution caused by autos and trucks
8. Matching funds for Federal/State/Regional transportation grants applied to any roadway transportation project included in the adopted Valley Transportation Plan

CIP PROJECT LISTS

The Capital Improvement Program is developed in accordance with the regionally adopted multimodal criteria for project selection. The criteria emphasize maintaining and sustaining the existing transportation system, improving its efficiency and effectiveness through congestion relief, safety improvements and consideration of freight movement, expanding the system, and accounting for external impacts on land use and air quality.

The CMP statute requires that capital improvement programs be submitted to the regional planning agency (the Metropolitan Transportation Commission in the Bay Area) for inclusion in the Regional Transportation Improvement Program (RTIP) and the Transportation Improvement Program (TIP). The statute then specifies that the regional agency shall:

1. Evaluate the consistency between the program and the regional transportation plans pursuant to Section 65080.
2. Find the program to be consistent and incorporate it into the regional transportation improvement program as provided for in Section 65082. If the regional agency finds the program is inconsistent, it may exclude any project in the Congestion Management Program from inclusion in the regional transportation improvement program.

The following pages contain the project lists constituting the Capital Improvement Program, listed, by mode, in Tables 8.1 through 8.8. Readers seeking additional information about a specific project should consult the project listing in the Transportation Improvement Program (http://www.mtc.ca.gov/funding/tip/index.htm).

TABLE 8.1 | CAPITAL IMPROVEMENT PROJECTS: HIGHWAY PROJECTS ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
US 101 / Mabury New Interchange	SCL070004	VTA	$20,750	$0	$20,750
Total			$20,750	$0	$20,750

TABLE 8.2 | CAPITAL IMPROVEMENT PROJECTS: EXPRESS LANE PROJECTS ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
US 101 Express Lanes	SCL110002	VTA	$431,000	$0	$431,000
SR 85 Express Lanes	SCL090030	VTA	$176,000	$4,800	$171,200
SR 237 Express Lanes: North 1ST Street to Mathilda Ave	SCL110008	VTA	$27,000	$1,600	$25,400
Total			$634,000	$6,400	$627,600

TABLE 8.3 | CAPITAL IMPROVEMENT PROJECTS: EXPRESSWAY PROJECTS ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
San Tomas Expressway Widening	SCL110007	Santa Clara County	$56,100	$0	$56,100
Total			$56,100	$0	$56,100

TABLE 8.4 | CAPITAL IMPROVEMENT PROJECTS: LOCAL STREETS PROJECTS ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Charcot Avenue Extension over I-880	SCL090003	San Jose	$30,200	$0	$30,200
Coleman Avenue Widening from I-880 to Taylor Street	SCL090005	San Jose	$13,000	$0	$13,000
SR 237/US 101/Mathilda Interchange Modifications	SCL130001	VTA	$40,000	$0	$40,000
Total			$83,200	$0	$83,200

TABLE 8.5 | CAPITAL IMPROVEMENT PROJECTS: PAVEMENT MANAGEMENT ($MILLIONS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Monterey Road Preservation	SCL130043	Morgan Hill	$1,690	$1,379	$311
San Jose Citywide Pavement Management Program	SCL130005	San Jose	$13,200	$11,531	$1,669
Winchester Blvd. Overlay Project	6590	Campbell	$554	$1,171	$1,725
Cupertino Pavement Management	6605	Cupertino	$879	$769	$110
Fremont Avenue Overlay	6678	Los Altos	$515	$306	$179
Street Resurfacing Project 2018	6672	Milpitas	$1,819	$1,609	$210

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Dunne Avenue Pavement Rehabilitation Project	6701	Morgan Hill	$1,252	$857	$395
West Middlefield Road Improvements	6690	Mountain View	$1,550	$1,136	$414
Palo Alto OBAG2 Street Resurfacing	6636	Palo Alto	$1,179	$1,009	$170
Tully Road Improvement Project	6647	San Jose	$16,711	$8,599	$8,112
McKee Road Improvement Project	6648	San Jose	$16,757	$8,623	$8,134
San Jose Pavement Maintenance	6652	San Jose	$18,137	$14,597	$3,540
Santa Clara Streets and Roads Preservation	6670	Santa Clara	$3,413	$2,356	$1,057
Capitol Expressway Pavement Rehabilitation	6748	Santa Clara County	$5,648	$5,000	$648
McKean Road Pavement Rehabilitation	6747	Santa Clara County	$1,920	$1,700	$220
Uvas Road Pavement Rehabilitation	6747	Santa Clara County	$1,700	$220	$1,921
Total			$87,695	$61,176	$26,489

TABLE 8.6 | CAPITAL IMPROVEMENT PROJECTS: TRANSIT ($ in THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
BART - Warm Springs to Berryessa Extension	SCL110005	VTA	$2,521,899	$1,242,520	$1,279,379
BART - Berryessa to San Jose Extension	BRT030001	VTA	$4,944,676	$360,340	$4,584,336
LRT Extension to Vasona Junction	SCL090040	VTA	$176,000	$0	$176,000
Stevens Creek Bus Rapid Transit	SCL110010	VTA	$161,507	$713	$160,794
Capitol Expressway LRT Extension	SCL050009	VTA	$293,9000	$57,540	$236,360
El Camino Real Bus Rapid Transit	SCL110009	VTA	$233,700	$0	$233,700
San Jose International Airport People Mover	SCL090019	VTA	$50,000	$0	$50,000
Total			$8,381,682	$1,661,113	$6,720,569

TABLE 8.7 | CAPITAL IMPROVEMENT PROJECTS: SYSTEMS OPERATION AND MANAGEMENT PROGRAM ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Sunnyvale Traffic Signal Upgrades	6632	Sunnyvale	$2,899	$2,566	$333
Total			$2,899	$2,566	$333

TABLE 8.8 | CAPITAL IMPROVEMENT PROJECTS: BICYCLE/PEDESTRIAN AND "LIVABLE COMMUNITIES" PROJECTS ($ IN THOUSANDS)

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
New Ronan Channel and Lions Creek Trail	SCL110032	Gilroy	$1,929	$1,706	$223
Montague Expy Ped Bridge at Milpitas BART Station	SCL130040	VTA	$841	$744	$97
Bay Trail Reach 9	SCL050082	San Jose	$2,378	$675	$1,703
Coyote Creek Trail	SCL050083	San Jose	$14,769	$3,674	$11,095
Los Gatos Creek Trail Reach 5 Bridge Crossings	SCL110029	San Jose	$4,600	$1,250	$3,350
Adobe Creek/ Highway 101 Bicycle Pedestrian Bridge	SCL130041	Palo Alto	$9,500	$4,000	$4,500
San Jose Pedestrian Oriented Traffic Signals	SCL130010	San Jose	$3,472	$3,000	$472
San Tomas Aquino Spur Trail Phase 2	SCL130022	Santa Clara County	$4,594	$3,234	$1,360
San Jose Meridian Bike/Ped Improvements	SCL130004	San Jose	$1,674	$1,150	$524
St. Johns Bikeway and Pedestrian Improvements	SCL130011	San Jose	$1,500	$1,185	$315
East San Jose Pedestrian Improvements	SCL110121	Santa Clara County	$2,660	$2,128	$532
Miramonte Ave. Bike/Ped Access Improvements	6700	Los Altos	$1,000	$581	$1,581
Waverley, E. Meadow & Fabian Enhanced	6655	Palo Alto	$919	$480	$1,399

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Bikeways					
Mt. Pleasant Bike/Ped Traffic Safety Improvements	6657	San Jose	$1,000	$860	$1,860
San Tomas Aquino Creek Trail Underpass	6634	Santa Clara	$2,449	$1,271	$3,069
Saratoga Creek Trail Phase 1	6635	Santa Clara	$3,735	$1,591	$5,326
Hetch-Hetchy Trail Phase 1	6668	Santa Clara	$790	$504	$1,250
Java Road Diet and Bike Lanes	6566	Sunnyvale	$500	$133	$633
Fair Oaks Bikeway Phase 2	6619	Sunnyvale	$783	$208	$991
Lawrence Station Area Sidewalks & Bike Facilities	6627	Sunnyvale	$500	$133	$633
Bike/Ped Infrastructure Improvements	6764	Sunnyvale	$919	$244	$1,163
Almaden Ave & Vine St Safety Improvements	SCL090004	San Jose	$1,815	$1,500	$315
Saratoga Village Sidewalk Rehabilitation	SCL130027	Saratoga	$183	$162	$21
Prospect Road Complete Streets	SCL130026	Saratoga	$4,765	$4,205	$560
Capitol Expressway ITS and Bike/Ped Improvements	SCL130037	County of Santa Clara	$9,400	$7,500	$1,900
East San Jose Bikeways	SCL130016	San Jose	$2,532	$2,000	$532
Sunnyvale/Saratoga Road Bike/Ped Safety	SCL130028	Sunnyvale	$663	$524	$139

Project Name	TIP ID	Sponsor	Total Funds	Discretionary	Local
Enhancmts.					
Maude Avenue Bikeway and Streetscape	SCL130030	Sunnyvale	$880	$695	$185
Fair Oaks Avenue Bikeway and Streetscape	SCL130029	Sunnyvale	$1,210	$956	$254
SRTS Ped Infrastructure Improvements	SCL130032	Sunnyvale	$1,900	$1,570	$330
Arastradero Road Schoolscape/Multiuse Trail	SCL130034	Palo Alto	$1,502	$1,000	$502
Jackson Ave Bicycle and Pedestrian Improvements	SCL130007	San Jose	$1,899	$1,500	$399
Eden Avenue Sidewalk Improvements	6640	Campbell	$555	$175	$582
El Camino ReaL Pedestrian Safety and Streetscape	6630	Palo Alto	$4,655	$709	$5,300
West San Carlos Urban Village	6752	San Jose	$7,932	2,168	$10,100
Santa Clara School Access Improvements	6669	Santa Clara	$1,145	$504	$1,649
Saratoga Village Crosswalks and Sidewalk Rehab	6664	Saratoga	$338	$84	$422
Peery Park "Sense of Place" Improvements	6631	Sunnyvale	$2,686	$714	$3,400
East Sunnyvale Area "Sense of Place	6617	Sunnyvale	$3,047	$810	$3,856
Homestead High School Improvements	6763	Sunnyvale	$1,000	$265	$1,265
Total			$49,890	$33,910	$16,478

CHAPTER 9 | MONITORING AND CONFORMANCE ELEMENT

BACKGROUND

State statute sections 65089.1 and 65089.2 identify a number of program elements and responsibilities pertaining to the establishment of a Congestion Management Program. Section 65089.3 charges the Congestion Management Agency with monitoring all elements of the program on a biennial basis. VTA, as the CMA for Santa Clara County, meets and exceeds this requirement.

Specifically, the CMA must monitor the level of service on the CMP roadway network (Freeways, State Highways and Principal Arterials) as well as the impacts of land use changes to determine whether Member Agencies are conforming to the CMP. The CMA must also ensure that its Member Agencies are meeting transportation impact analysis submittal requirements. Failure to conform to the CMP may result in the withholding of Member Agency Proposition 111 (1991) gas tax revenue.

Monitoring findings are released each spring in the Monitoring and Conformance Report after receiving months of input from VTA's Systems Operations & Management Working Group and other Member Agency staff. The Report is reviewed by VTA's Advisory and Standing Committees and is ultimately approved by the Board of Directors.

AUTO LEVEL OF SERVICE STANDARD

Statute 65089 (1)(A) identifies auto Level of Service (LOS)—a sliding A through F scale where LOS A indicates no traffic congestion and LOS F indicates significant congestion—as the measure to apply to CMP network operation. The statute establishes LOS E as the minimum CMP auto LOS standard. CMP facilities operating below LOS E will be considered non-conforming. CMP facilities operating below LOS E prior to 1991 are exempt from meeting the LOS standard. Further discussion of the VTA CMP auto LOS standard is provided in Chapter 3 of this document.

SCOPE OF THE MONITORING PROGRAM, RESPONSIBILITY AND METHODOLOGY

Below is a discussion of how data is collected and analyzed for conformance for each section of the Monitoring Program. In some areas the methodology is mandated by the CMA legislation. In other areas the CMA and Member Agencies have collaborated to determine the proper methodology. Detailed discussions of level of service methodology can be found in VTA's Traffic Level of Service Analysis Guidelines. Further information about the methodology for data collection in the monitoring program is included in the 2014 Monitoring and Conformance

Report. This section also indicates whether the Member Agencies or VTA are responsible for monitoring, and how often the monitoring takes place.

FREEWAYS (VTA RESPONSIBILITY, UNDERTAKEN ANNUALLY)

Each fall, VTA collects AM and PM peak period data for the freeways in the CMP network. Since 1997, the VTA has used aerial photography to collect a comprehensive set of data for every freeway segment. The aerial photographs are used to measure traffic density, which forms the basis to calculate LOS as well as speed and flow rates based on a density-speed curve.

Transition to Big Data

In 2014, VTA initiated a study that investigated freeway data collection techniques that utilize innovative new methodologies, namely Big Data.[1] VTA staff worked with a consultant to apply this methodology to the CMP Monitoring and Conformance Program. Using the 2014 monitoring study, the aerial photography method was utilized but was compared side-by-side with data collected at the same times and locations by video camera, the Caltrans Performance Measurement System (PeMS), and INRIX ('big data' from a variety of sources). This effort provided a more comprehensive data set for a lower cost than aerial photography.

This comparison assisted VTA and its Member Agencies in determining the usefulness of these data sources for future monitoring studies. No timetable has been set for the use of Big Data in the monitoring study, but VTA is implementing this technique in the near-term, with the 2017 Monitoring Program as a test run to determine whether it will be used in the future monitoring program cycles.

VTA envisions that a transition to big data could improve the Monitoring Program, not only by potentially providing more data for a lower cost, but also by widening the scope of transportation analysis in Santa Clara County. Over the coming years VTA staff will evaluate the suitability of big data to conduct research in the following areas:

- Vehicle miles traveled
- Duration of congestion
- Automobile travel times and reliability
- Congestion spillover to alternate routes

[1] Big Data is a phenomenon currently impacting a wide range of industries, defined as "a new generation of technologies and architectures designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery, and/or analysis" (Big Data: Beyond the Hype, White Paper by Datastax Corporation, March 2012). In the field of transportation monitoring and analysis, Big Data methods involve aggregating traffic-related information from GPS-enabled vehicles and mobile devices, traditional road sensors and hundreds of other sources (INRIX website, accessed 9/11/2013).

- Causes of congestion
- Transit travel times and reliability
- Modal split
- Automobile trip generation

LAND USE APPROVALS (MEMBER AGENCY RESPONSIBILITY, UNDERTAKEN ANNUALLY)

Each summer Member Agencies are requested to submit land use approval data for the prior fiscal year to VTA. The data submittal identifies the parcel number, traffic analysis zone (TAZ), zoning designation/change, number of residential units added/removed and the number of commercial/industrial square feet added/removed.

VTA tallies the annual change in residential units and commercial/industrial square footage on a city and countywide basis, identifies development trends and undertakes a geographic analysis of land use changes. The data appears alongside data from previous years in the Monitoring and Conformance Report. Figure 9.1 shows the locations of residential land use approvals from fiscal year 2016. Figure 9.2 shows the locations of commercial/industrial land use approvals for the same year.

TRANSPORTATION IMPACT ANALYSIS (MEMBER AGENCY RESPONSIBILITY, CONTINUALLY AS APPROPRIATE)

Member Agencies are required to undertake a Transportation Impact Analysis (TIA) when a project is expected to produce more than 100 net new peak hour trips during the AM or PM peak hour (weekdays) or the peak hour (weekends). TIAs are required to be submitted to VTA for review and comment at least 20 calendar days before the project is considered for approval or recommended for approval. See Chapter 7 for further discussion of TIAs and the TIA Guidelines.

CMP INTERSECTIONS (MEMBER AGENCY RESPONSIBILITY PERFORMED BY VTA, UNDERTAKEN BIENNIALLY)

The operation of principal arterials and state highways located within urbanized Santa Clara County is measured by the level of service at CMP Intersections. CMP intersections are select, generally high-volume intersections located along these thoroughfares. 252 CMP intersections are currently monitored. Every other fall, the PM peak period vehicle volume data for each CMP Intersection is collected and analyzed. CMP Intersection data will next be collected for the 2018 monitoring cycle. Traditionally, data collection for CMP intersection monitoring has been a Member Agency responsibility. However, based on an agreement between VTA and the Member Agencies in 2011, data collection for CMP intersections is currently performed by VTA.

FIGURE 9.1 | APPROVED HOUSING UNITS NEAR VTA'S CORES, CORRIDORS AND STATION AREAS (2016 NET CHANGE)

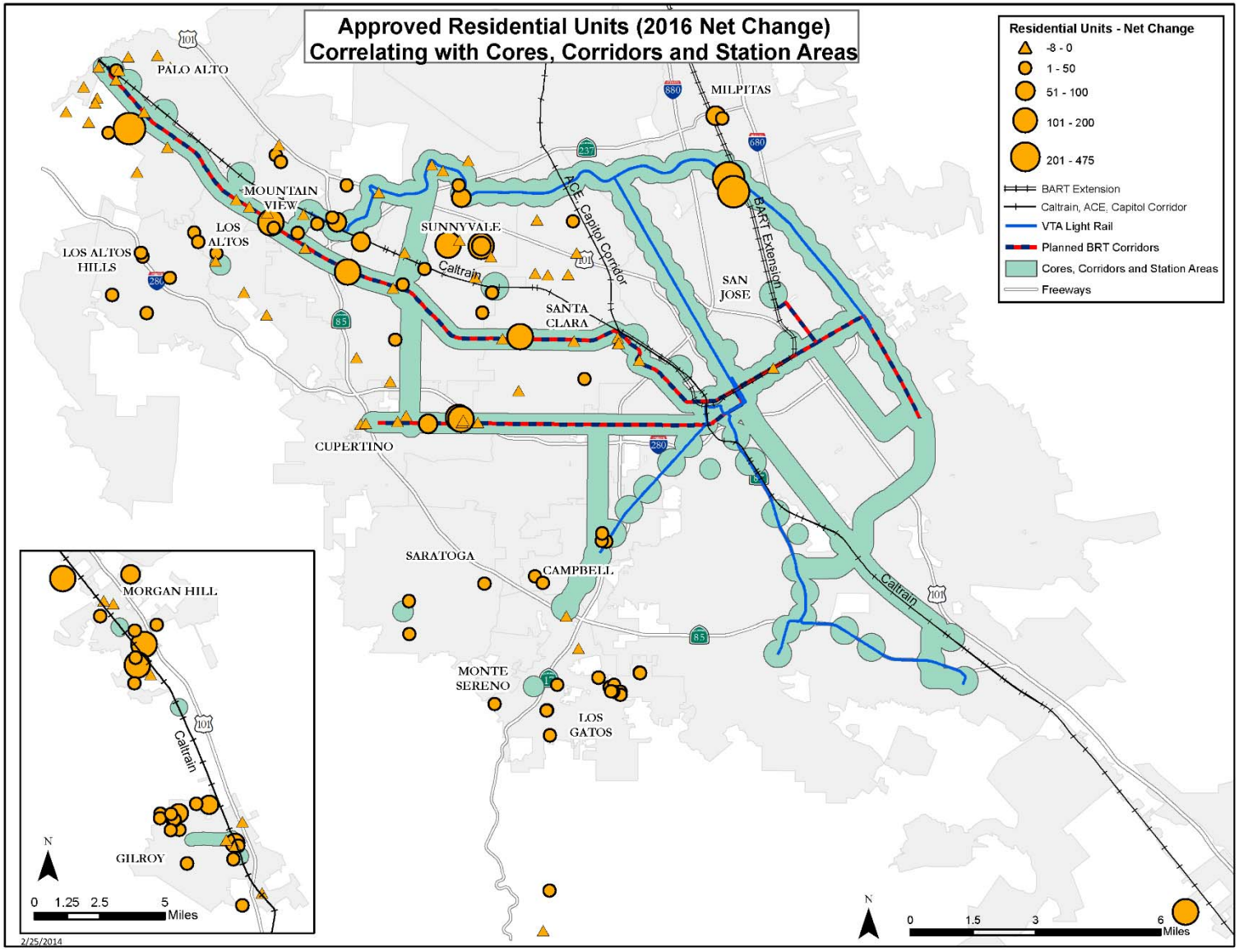
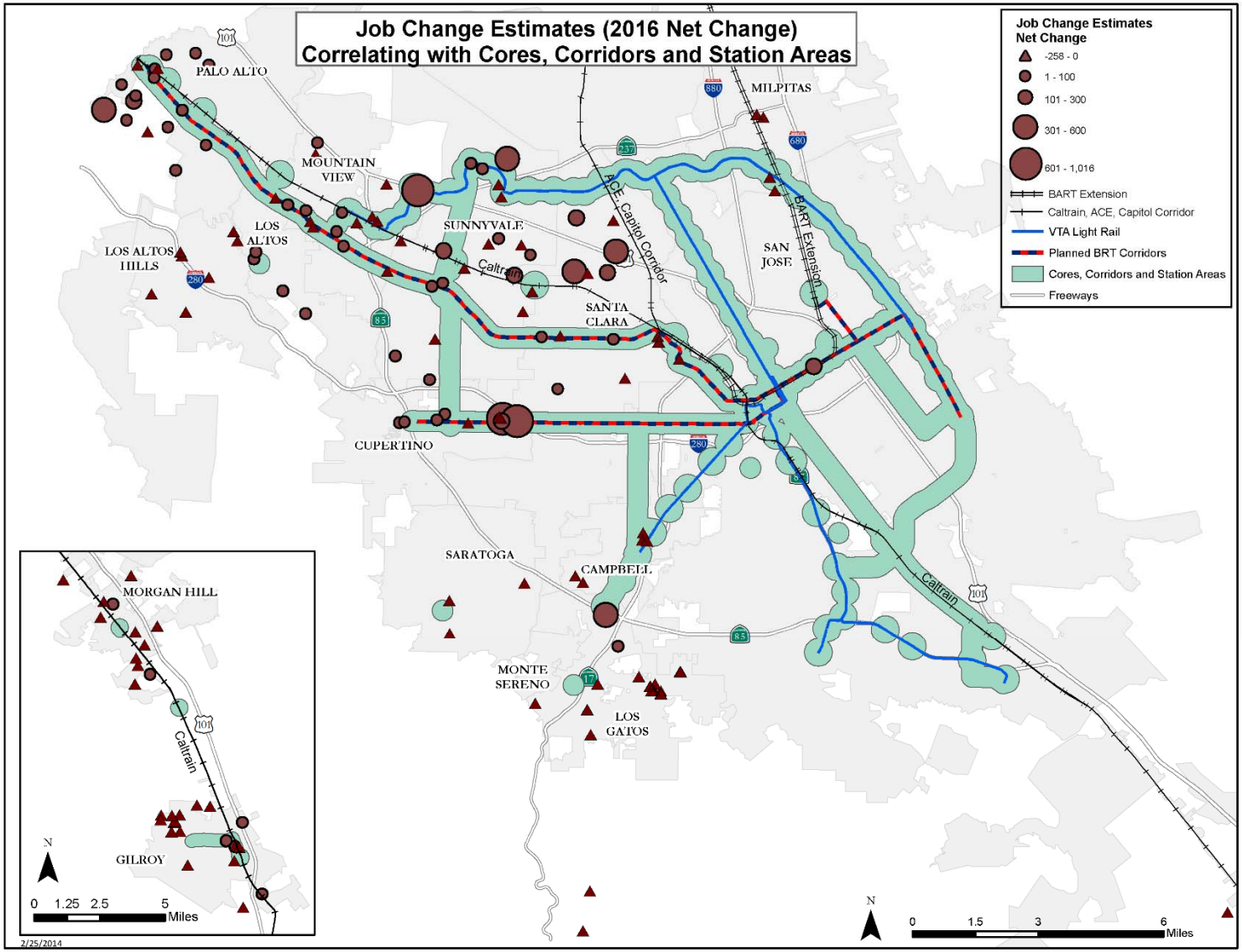


FIGURE 9.2 | JOB CHANGE ESTIMATES NEAR VTA'S CORES, CORRIDORS AND STATION AREAS (2016 NET CHANGE)



For CMP Intersections level of service is calculated in terms of Average Control Delay—the average number of seconds a vehicle must wait at the intersection. The methodology is based on the 2000 Highway Capacity Manual.

RURAL HIGHWAYS (VTA RESPONSIBILITY, UNDERTAKEN BIENNIALLY)

Every other fall, VTA uses hose counters to conduct three-day counts at twelve locations along Santa Clara County's rural highways. Counts are recorded in 15-minute intervals with the one-hour period that shows the greatest combined vehicle volume considered the peak period. Automatic hose counters are used to measure vehicle counts by the number of times the hose is depressed by traveling vehicles. The LOS procedure in the 2000 Highway Capacity Manual is used to measure the percent time-spent following and average travel speed, with appropriate inputs for peak hour and peak 15 minute traffic volumes, the percentage split between the two directions of traffic, the percentage of trucks in the traffic flow, and the type of terrain. Rural highway data will next be collected for the 2018 monitoring cycle.

MULTIMODAL IMPROVEMENT PLAN MONITORING (MEMBER AGENCY RESPONSIBILITY, UNDERTAKEN ANNUALLY)

Multimodal Improvement Plans shall be prepared by Member Agencies in situations where the CMP Traffic Level of Service standard is violated or is likely to be violated in the future. The requirements for preparing Multimodal Improvement Plans are set forth in VTA's Deficiency Plan Requirements, which were most recently updated in September 2010 and are described further in Chapter 10. Member Agencies with approved Multimodal Improvement Plans are responsible for preparing an Implementation Status Report that documents progress on the implementation of all the improvements and actions included in the Multimodal Improvement Plan. These Status Reports are to be submitted annually by the Member Agencies with approved Multimodal Improvement Plans. As part of its monitoring process, VTA will review Member Agencies' Implementation Status Reports for purposes of determining conformance with the CMP.

MONITORING AND CONFORMANCE PROCESS

The following is a brief summary of the steps in the VTA CMP Monitoring and Conformance Process over the course of the fiscal year. Table E.1 in the Executive Summary summarizes the CMP Elements, monitoring and conformance requirements, timing, and responsible agency in tabular form.

July – VTA alerts Member Agencies of monitoring requirements and deadlines for data submittal. The notification contains paper and electronic versions of the annual monitoring and conformance requirements, land use approval worksheet, certification form and supporting documents.

Fall – Member Agencies assemble land use approval data and TIA submittals. VTA collects all data for the CMP Monitoring Program between Labor Day and the Thanksgiving Holiday week. Freeway data and land use data are collected every year. Biennially, data is also collected for CMP Intersections, rural highways and bicycle and pedestrian volumes. Member Agencies with approved Multimodal Improvement Plans prepare Implementation Status Reports annually.

Winter – VTA staff receives and analyzes monitoring data. Monitoring data is presented to the Systems Operations & Management Working Group (SOMWG) for review and discussion.

Spring – VTA presents the Draft Monitoring and Conformance Report and conformance findings to the SOMWG, select advisory and standing committees and the Board of Directors for adoption.

If a Member Agency is found in non-conformance with the CMP, the agency will be notified by VTA in writing and will have 90 days to achieve conformance. If a Member Agency finds flaws with a finding of non-conformance, the agency has 60 days to submit a written response either disputing the finding by documenting any errors related to the determination of conformance or detailing how the agency will respond to the violation, for instance by developing a Multimodal Improvement Plan. Written responses must be signed by the city manager/town manager/county executive.

If a Member Agency found to be non-conforming has not achieved conformance within the 90 days following written notice, the VTA Board of Directors will make a finding of non-conformance and will notify the State Controller, who will withhold gas tax subventions from the non-conforming jurisdiction.

Summer – Following adoption by the Board of Directors, a final version of the Monitoring Report is released incorporating feedback, if any, from the committees and the Board.

RELEVANT TECHNICAL GUIDELINES

The following Technical Guidelines of the VTA Congestion Management Program are relevant to the Monitoring and Conformance process. The versions/dates listed are the most current as of fall 2015.

- Traffic Level of Service Analysis Guidelines (adopted June 2003)
- Annual Monitoring Requirements (revised April 2004)
- Deficiency Plan Requirements (adopted September 2010)
- Transportation Impact Analysis Guidelines (adopted October 2014)

CHAPTER 10 | MULTIMODAL IMPROVEMENT PLAN ELEMENT

This chapter describes the Congestion Management Program Multimodal Improvement Plan Element, and includes the following sections:

- VTA Approach to Multimodal Improvement Planning
- Multimodal Improvement Plan Requirements
- Multimodal Improvement Plan Evaluation
- Multimodal Improvement Plan Monitoring
- Local Multimodal Improvement Plans
- Compliance and Conformance

INTRODUCTION

The Congestion Management Program (CMP) Statute states that, "When the level of service on a segment or at an intersection fails to attain the established level of service standard… a deficiency plan shall be adopted pursuant to Section 65089.4."

Beginning with the 2013 CMP, VTA uses the term "Multimodal Improvement Plan" for "Deficiency Plan" as defined by state legislation. The purpose of this change is to highlight the positive role a Multimodal Improvement Plan can play in identifying measures available to Member Agencies to improve multimodal transportation options in situations where it is infeasible or undesirable to address a level of service (LOS) deficiency by expanding automobile capacity. Prior to August 2013, VTA used the term "Deficiency Plan," so this term still occurs in the Board-adopted VTA Deficiency Plan Requirements (2010) as well as two Deficiency Plans that have been adopted by cities in Santa Clara County.

To be consistent with CMP Statute, Multimodal Improvement Plans must include a list of improvements, programs, or actions that measurably improve multimodal performance and contribute to significant improvements in air quality. If a CMP System facility falls below the LOS standard and does not have an approved Multimodal Improvement Plan, then the local jurisdiction in which the facility is located is at risk of losing gas tax revenues provided from Proposition 111.

Multimodal Improvement Plans allow local jurisdictions to proceed with development projects even if adherence to CMP auto LOS standards cannot be achieved for specific facilities. In some situations, meeting LOS standards may be infeasible or undesirable. For these situations, Multimodal Improvement Plans allow local jurisdictions to adopt innovative and comprehensive

transportation strategies for improving system-wide multimodal transportation rather than strictly adhering to an auto LOS standard that may contradict other community goals, such as concentrating higher-density development near transit or maintaining the attractiveness of streets for pedestrians and bicyclists. In other words, Multimodal Improvement Plans allow Member Agencies to trade off increased congestion on one CMP facility for transportation system improvements to other facilities or services (e.g. transit, bicycling, walking, or transportation demand management).

VTA APPROACH TO PREPARING MULTIMODAL IMPROVEMENT PLANS

VTA has been proactive in the development of guidelines and standards for Multimodal Improvement Plans. The approach taken by the VTA Board has been to create a clear set of guidelines so that traffic congestion and off-setting improvements can be addressed in advance and development projects are not delayed by the process.

The Technical Advisory Committee (TAC) began the development of guidelines for the preparation of Multimodal Improvement Plans, then referred to as Deficiency Plans, immediately upon completion of Santa Clara County's first Congestion Management Program in 1991. The first Requirements for Deficiency Plans were adopted in November 1992. These standards were revised by VTA in consultation with its Member Agencies in 2009 and 2010, and new Deficiency Plan Requirements were adopted by the VTA Board in September 2010.

The following is VTA's approach to the preparation of Multimodal Improvement Plans.

- All Multimodal Improvement Plans must be one of the following three types:
    1. Mini Multimodal Improvement Plan: A Mini Multimodal Improvement Plan is prepared to address a single CMP Intersection or roadway facility, typically in conjunction with a Transportation Impact Analysis (TIA) Report for a single development project.
    2. Specific Area Multimodal Improvement Plan: A Specific Area Multimodal Improvement Plan is prepared for a CMP roadway segment or set of intersections within a localized specific area such as a downtown or special district.
    3. Areawide Multimodal Improvement Plan: An Areawide Multimodal Improvement Plan is prepared to address all the CMP System roadways or intersections included in an identified area such as an entire city or an area that covers multiple jurisdictions and/or cities.
- VTA recommends that Member Agencies prepare Areawide Multimodal Improvement Plans whenever possible. This will reduce the number of Multimodal Improvement Plans prepared and lead to implementation of comprehensive solutions to transportation problems.

- VTA requires that each Multimodal Improvement Plan include implementation of all feasible and applicable actions on the "Deficiency Plan Action List" provided in the VTA Deficiency Plan Requirements. Member Agencies must identify how all of these specific actions will be implemented as part of the Multimodal Improvement Plan.
- VTA requires that each Multimodal Improvement Plan demonstrate, to the extent practical, how the actions included in the Plan, such as improved public transit service and facilities, improved non-motorized transportation facilities, and enhanced transportation demand management measures, will improve system-wide multimodal performance and air quality.

MULTIMODAL IMPROVEMENT PLAN REQUIREMENTS

VTA's most recent document addressing the policies and procedures for Multimodal Improvement Plans is the Board-adopted Deficiency Plan Requirements, September 2010.

The CMP Statute states that "The deficiency plan shall include the following elements" (summarized from California Government Code Section 65089.4):

1. Analysis of the cause of the deficiency;
2. Analysis of the improvements needed to maintain the CMP auto LOS standard on the deficient facilities and the cost of those improvements;
3. A list of alternative improvements, programs or actions that will improve multimodal performance and improve air quality; and
4. An action plan for implementing the improvements outlined in (2) or the alternative actions outlined in (3).

The CMP statute requires congestion management agencies to use the action items from the Deficiency Action List developed by the local air quality management district. The air quality management district for Santa Clara County, the Bay Area Air Quality Management District (BAAQMD) adopted a Deficiency Plan Action List in November 1992. The BAAQMD's list is based on the Transportation Control Measures (TCMs) in the Bay Area Clean Air Plan. The most recent Bay Area Clean Air Plan was adopted in April 2017 and contains an updated list of TCMs that can guide the development of Multimodal Improvement Plans (see Appendix G for a complete list of TCMs in the 2017 Clean Air Plan). Therefore, Multimodal Improvement Plans will be a significant means of implementing TCMs and working towards improved air quality in Santa Clara County.

VTA's Deficiency Plan Requirements include the BAAQMD Deficiency Plan action list, as Appendix C of the document. Where appropriate, VTA's requirements contain edits that have

been made to the Air District's Deficiency Plan action list to reflect current standards and practices applicable to Santa Clara County.

MULTIMODAL IMPROVEMENT PLAN UPDATES

Multimodal Improvement Plans must be updated when transportation and/or development projections change significantly from the assumptions used for the Multimodal Improvement Plan. Multimodal Improvement Plan monitoring requirements are addressed later in this chapter.

MULTIMODAL IMPROVEMENT PLAN EVALUATION

Member Agencies must prepare Multimodal Improvement Plans and adopt them at a noticed public hearing. The Multimodal Improvement Plan is then submitted to VTA. According to the CMP Statute:

> "A city or county shall forward its adopted deficiency plan to the agency within 12 months of the identification of a deficiency. The agency shall hold a noticed public hearing within 60 days of receiving the deficiency plan. Following the hearing, the agency shall either accept or reject the deficiency plan in its entirety, but the agency may not modify the deficiency plan. If the agency rejects the plan, it shall notify the city or county of the reasons for that rejection." (California Government Code Section 65089.4(d))

The VTA Deficiency Plan Requirements define the criteria that will be used to approve or reject Member Agency Multimodal Improvement Plans. VTA staff will analyze Multimodal Improvement Plans submitted by Member Agencies using the adopted criteria, and present a report to the VTA Board that documents their findings and contains a recommendation to approve or reject the Multimodal Improvement Plan.

MULTIMODAL IMPROVEMENT PLAN CRITERIA

The following criteria will be used when evaluating Multimodal Improvement Plans:

1. Are all actions on the most current version of the Deficiency Plan Action List that are applicable and feasible included in the Multimodal Improvement Plan? Are the reasons why any actions found to be inapplicable or infeasible adequate?
2. Are sufficient actions included in the Multimodal Improvement Plan to compensate for the deficient facility's unacceptable LOS? Are these actions on the Deficiency Plan Action List or have they been approved by the BAAQMD? Is the technical analysis of physical improvements included in the Multimodal Improvement Plan adequate?

3. Does the Multimodal Improvement Plan include a workable program to guarantee implementation of all actions and improvements included in the Multimodal Improvement Plan?
4. Are the costs for implementation of the Multimodal Improvement Plan actions reliably estimated? Does the Multimodal Improvement Plan include an adequate method for financing the actions and improvements?
5. Are the Multimodal Improvement Plan actions and improvements consistent with all appropriate regional and local plans? (i.e. the Regional Clean Air Plan, the Regional Transportation Plan, the Regional Transportation Improvement Program, the BAAQMD's Deficiency Plan Action List and any subsequent requirements, and applicable General Plans).
6. Did the local jurisdiction consult with all appropriate neighboring jurisdictions and agencies when preparing the Multimodal Improvement Plan?
7. Does the Multimodal Improvement Plan include a monitoring program that will assess whether Multimodal Improvement Plan actions and improvements have been implemented?
8. Did the Member Agency prepare an adequate environmental analysis of the Multimodal Improvement Plan?

In accordance with CMP statute, VTA will consider Multimodal Improvement Plans at a noticed public hearing. If a Multimodal Improvement Plan is rejected, VTA will provide a written report that documents its reasons for rejecting the Multimodal Improvement Plan.

MULTIMODAL IMPROVEMENT PLAN MONITORING

Multimodal Improvement Plans must be monitored as part of the CMP Monitoring and Conformance Program. Member Agencies will monitor implementation of Multimodal Improvement Plan actions by preparing a Multimodal Improvement Plan Implementation Status Report. This status report will be based on the implementation schedule included in the Multimodal Improvement Plan.

If a Member Agency is not meeting the implementation schedule it set forth in a Multimodal Improvement Plan, VTA may require the Member Agency to expedite the implementation of their Multimodal Improvement Plan, or the Member Agency could be found in nonconformance with the CMP and lose gas tax revenues generated by Proposition 111.

As part of its CMP Monitoring and Conformance Program, VTA performs an evaluation of the multimodal performance of the CMP Transportation System which helps evaluate the overall effectiveness of VTA and Member Agency efforts to improve the system, including the Capital Improvement Program and the adopted Multimodal Improvement Plans. It must be

emphasized that it will be difficult to measure quantitatively the effect of individual actions or even of individual Multimodal Improvement Plans, especially since most of the actions are designed to achieve maximum effectiveness over the long term. VTA uses several types of quantitative data to analyze overall CMP effectiveness. The data may include LOS data submitted to the CMA by Member Agencies as part of the LOS monitoring program, pedestrian and bicycle count data collected as part of the monitoring program, and modeling data, such as vehicle miles traveled and mode shares, gathered from VTA's Countywide Transportation Model.

LOCAL MULTIMODAL IMPROVEMENT PLANS

To date, two Multimodal Improvement Plans have been developed by cities and approved by the VTA Board of Directors. Both were adopted as "Deficiency Plans." The City of Sunnyvale developed a Citywide Deficiency Plan which was approved by the VTA Board in January 2006, and the City of San Jose developed the specific area North San Jose Deficiency Plan that was approved by the VTA Board in June 2007. Two other cities in Santa Clara County are in the process of developing Multimodal Improvement Plans; the City of Mountain View is preparing a citywide plan, and the City of Santa Clara is preparing a plan for northern Santa Clara associated with the City Place development project. Other cities in Santa Clara County such as San Jose are considering developing Multimodal Improvement Plans to address LOS deficiencies associated with development projects or land use plans. Further information about specific Multimodal Improvement Plans in Santa Clara County is provided in the CMP Monitoring and Conformance Report. VTA will work with local agencies that develop new Multimodal Improvement Plans, and as they are adopted these plans will be monitored per CMP requirements.

COMPLIANCE AND CONFORMANCE

In order to be in conformance with the Congestion Management Program, Member Agencies must:

- Prepare Multimodal Improvement Plans for facilities that violate CMP auto LOS standards or that are projected to violate LOS standards using the adopted VTA Deficiency Plan Requirements.
- Submit Multimodal Improvement Plan Implementation Status Reports as part of the CMP Monitoring process.

APPENDIX A | GLOSSARY

2016 Measure B: A 30-year, half-cent countywide sales tax to enhance transit, highways, expressways and active transportation (bicycles, pedestrians and complete streets) adopted in November 2016.

AB-32: Assembly Bill 32 (Nunez) The California Global Warming Solutions Act of 2006. AB-32 was signed into law by Governor Arnold Schwarzenegger on September 27, 2006. The bill required the California Air Resources Board to adopt regulations that require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with the regulations.

ABAG: Association of Bay Area Governments. The regional planning agency for the nine counties and 101 cities and towns of the San Francisco Bay region.

ADT: Average Daily Traffic. Average number of vehicles passing a specified point during a 24-hour period.

AQAP: Air Quality Attainment Plan. The plan for attainment of state air quality standards, as required by the California Clean Air Act of 1988. Air Quality Attainment Plans are adopted by air quality districts and subject to approval by the California Air Resources Board.

Approved Project: Any land use project that is expected to generate trips on the designated CMP System. "Approved projects" include such land use approvals as planned development zonings, planned development permits, site and architectural permits, conditional permits, and actions that represent final land use approval and create a land use entitlement.

Automobile Level of Service: Automobile Level of Service (commonly shortened to "auto LOS") describes the operations of roadway segments or intersections in terms of vehicle speed, volume and capacity, and traffic delay. Auto LOS measurements are given by letter designations, from A (least congested) to F (most congested). Procedures to analyze Auto LOS for CMP purposes are defined in the VTA Traffic LOS Analysis Guidelines. Auto LOS evaluates operations for all common motor vehicle types, including automobiles, light and heavy trucks, and motorcycles. In addition, although congestion also affects transit vehicles operating in general purpose lanes, transit operations are affected by additional factors and are typically evaluated separately from auto LOS.

BAAQMD: Bay Area Air Quality Management District. The regional agency created by the state legislature for the Bay Area air basin (Alameda, Contra Costa, a portion of Solano and Sonoma, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties) that develops, in conjunction with MTC and ABAG, the air quality plan for the region. BAAQMD has an active role in approving the TCM (see definition below) plan for the region, as well as in controlling stationary and indirect sources of air pollution.

Baseline LOS: 1991 CMP level of service. Traffic volumes used to calculate the baseline LOS include existing 1991 intersection volumes, and new trips generated from projects approved as of April 17, 1991 and funded transportation improvements.

Big Data: A phenomenon currently impacting a wide range of industries, defined as "a new generation of technologies and architectures designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery, and/or analysis" (Big Data: Beyond the Hype, White Paper by

Datastax Corporation, March 2012). In the field of transportation monitoring and analysis, Big Data methods involve aggregating traffic-related information from GPS-enabled vehicles and mobile devices, traditional road sensors and hundreds of other sources (INRIX website, accessed 9/11/2013).

Caltrans: California State Department of Transportation. As the owner/operator of the state highway system Caltrans is responsible for the safe operation and maintenance of the highway.

Capital Priorities: A process used by MTC to evaluate and prioritize transit projects in the region. All sources of transit funding, including FTA grants, state programs, and other sources are considered. This process involves all of the transit operators in the region, including bus, rail, and ferries.

Carpooling: A carpool is formed with a minimum of two people who commute on a regular basis. Carpoolers generally live and work in close proximity to each other and share common commuting patterns and schedules.

CAP: Clean Air Plan. A set of guidelines that are designed to improve air quality, protect public health, and protect the climate.

CDT Program: VTA's Community Design & Transportation (CDT) Program, adopted by Board Resolution No. 02.11.35, is VTA's primary program designed to integrate transportation infrastructure improvements and land use development.

CEQA: California Environmental Quality Act. This act sets environmental standards designed to enhance environmental quality and to control environmental pollution throughout the state of California.

CIP: Capital Improvement Program. A seven year program established by CMP to create projects to maintain or improve the auto level of service and transit performance standards, and to mitigate regional transportation impacts identified by the CMP Land Use Analysis Program, which conforms to transportation-related vehicle emissions air quality mitigation measures.

CMA: Congestion Management Agency: The CMA is a countywide organization responsible for preparing and implementing the county's Congestion Management Program. In Santa Clara County, VTA is the designated CMA.

CMAQ: Congestion Mitigation and Air Quality Improvement Program. A federal funding program established by ISTEA and continued in TEA-21 and SAFETEA-LU specifically for projects and programs that contribute to attainment of national ambient air quality and safety standards. The funds are available to non-attainment areas based on population and the severity of pollution. Eligible projects will be defined by the State Implementation Program (SIP), the State's air quality plan.

CMIA: Corridor Mobility Improvement Account. A State Funding program for projects on the California State Highway System that: reduce travel time or delay, improves connectivity of the State Highway System between rural, suburban and urban areas, or improves the operation and safety of a highway or road segment; improves access to jobs, housing, markets and commerce; and begin construction before December 2012.

CMP: Congestion Management Program. A multi-jurisdictional program to manage traffic congestion. (This is required of every county in California that has urbanized areas of at least 50,000 people). Unless specified, CMP will mean the Santa Clara Valley Transportation Authority's Congestion Management Program.

Commute: A trip that consists of traveling between home and work.

Commute Alternatives: An alternative mode of commuting to a single-occupancy vehicle, including using public transit, bicycling, and walking to work.

Compressed Work Week: A work schedule for an employee that eliminates at least one round-trip commute either weekly or every other week. An example would be working forty hours in a compressed week (e.g. four ten-hour days) or a work plan that allows one day off every other week.

CTC: California Transportation Commission. A state agency that sets state spending priorities and allocates funding for highways and transit. The Governor of California appoints CTC members.

Deficiency Plan: See *Multimodal Improvement Plan.*

Express Lanes: High-occupancy toll lanes that combine the characteristics of HOV lanes and toll roads by allowing carpools, vanpools, and buses free access, while charging for single-occupant vehicles or drive alone use. In other areas outside Santa Clara County, Express Lanes may be called high-occupancy toll (HOT) or managed lanes.

Farebox Revenues: These are revenues collected from transit riders.

FCR: Flexible Congestion Relief. One of the state's funding programs for local or regional transportation projects that will reduce congestion. State highway projects, local roads, and rail guideway projects are all eligible.

FHWA: Federal Highway Administration. The federal agency responsible for the approval of transportation projects that affect the defined federal highway system. Administratively, it is under US DOT (Department of Transportation) and is the sister agency of FTA (see definition below).

Flexible Work Hours: This is a form of alternative work schedule. It is a policy that gives employees the option of varying their starting and stopping times each workday. Most policies specify a core period in the middle of the workday (e.g. 10:00 a.m. to 4:00 p.m.) when all employees are required to be present. The intent is to allow employees flexibility in their work hours to meet individual needs and provide an incentive to use commute alternatives such as carpooling or transit.

Floating Car Data: The floating car technique is a method used to estimate the average speed on a segment of highway. Traffic speeds are collected by driving with the stream of traffic and recording speed and travel time.

FTA: Federal Transit Administration. A component of the U.S. Department of Transportation, delegated by the Secretary of Transportation to administer the federal transit program under the Urban Mass Transportation Act of 1964, as amended, and various other statutes.

HCM: Highway Capacity Manual. A manual published by the Transportation Research Board (TRB) that contains concepts, guidelines, and equations to calculate the level of service on highways and intersections. In 2010 the manual was updated to include new level of service/quality of service measures for transit, pedestrians, and bicycles.

HOV: High Occupancy Vehicle Lane. A lane on a street or highway reserved for the use of high occupancy vehicles either all day or during specified periods (for example, during rush hours). Buses, carpools, and/or vanpools are allowed to use HOV lanes.

HSR: High Speed Rail. The project which is an intra-state high-speed rail link currently being planned by the California High Speed Rail Authority to help meet the anticipated increase in travel demand between the Bay Area and Southern California.

IIP: Interregional Improvement Program. This is a state funded program created by SB-45. IIP funds may be awarded to projects outside of the urbanized areas and for interregional projects. All IIP funds are programmed by Caltrans, via the Interregional Transportation Improvement Plan (ITIP) process, with final approval by CTC.

Indirect Source Control Measure: The federal Clean Air Act defines indirect source as "...a facility, building, structure, installation, real estate property, road or highway which attracts or may attract mobile sources of pollution." An indirect source control measure is a rule or ordinance established to reduce the mobile source emissions associated with specific activity centers such as those noted above.

Internal Trips: Trips expected to have both their origin and destination within a single development. An example of this is would be a development that has both office and residential space. In this example, internal trips between home and work would be counted as one trip when calculating trip generation.

IRRS: Interregional Road System. On February 1, 1990, Caltrans submitted a plan to the state legislature that identified a set of projects that "will provide the most adequate interregional road system to all economic centers in the State." The statute defined eligible routes, and specified that these new routes be located outside the boundaries of urbanized areas (urbanized areas have populations of 50,000 or more), "except as necessary to provide connection for continuation of the routes within urban areas." From this plan, Caltrans suggests projects, consistent with the Fund Estimate in its PSTIP, to the CTC for programming in the STIP.

ISTEA: Intermodal Surface Transportation Efficiency Act. In 1991, Federal legislation passed a bill that restructured the way funding was allocated to highway projects and included funding transit projects in urban areas. Key ISTEA components included increased flexibility in the programming of projects and a level playing field between highway and transit projects with a consistent matching ratio of 80% to 20%, respectively. There were ties to the Federal Clean Air Act and the Americans with Disabilities Act, and some major New Rail Starts (Section 3) funds earmarked for the Bay Area Region. ISTEA funding expired in 1997, and was followed by TEA-21, and then SAFETEA LU.

ITIP: Interregional Transportation Improvement Program. The ITIP is a four-year planning and expenditure program adopted by the CTC and updated in even numbered years. The ITIP covers rural highways and key interregional improvements including intercity rail.

Lead Agency: The local jurisdiction or agency responsible for approving a project's environmental analysis as required under CEQA and/or Transportation Impact Analysis report per CMP requirements.

LOS: Level of Service. This is a measure used by transportation professionals to grade performance of transportation facilities. LOS is graded on a scale of A (the best performance) to F (the worst performance).

Major Bus Stop: Per VTA Transit Sustainability Policy, a bus stop that is served by at least six public transit buses per hour per direction during peak periods.

Major Transit Stop: a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (California Government Code 21064.3).

Member Agency: A local jurisdiction that is a signatory of the CMA's Joint Powers Agreement. This includes all cities within the county, Santa Clara County, and the Santa Clara Valley Transportation Authority.

Mode Split: The share of all trips to and from a project site taken by each of the major transportation modes (automobile, carpool, transit, bicycle and pedestrian).

MPO: Metropolitan Planning Organization. A federally required transportation planning body responsible for the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP) in its region. The governor designates an MPO in every urbanized area with a population of over 50,000.

MTC: Metropolitan Transportation Commission. The metropolitan planning organization for the nine-county San Francisco Bay Area.

Multimodal Improvement Plan: VTA terminology for "Deficiency Plan" as defined by CMA statute. Multimodal Improvement Plans are plans to identify offsetting measures to improve transportation conditions on CMP facilities in lieu of making physical traffic capacity improvements such as widening an intersection or roadway.

Obligation: An action by an administrative agency to approve the spending of money to a specific grant recipient.

OPR: The Governor's Office of Planning and Research, created by statute in 1970, serves the Governor and his Cabinet as staff for long-range planning and research, and constitutes the comprehensive state planning agency.

Parking Management Program: In the workplace context, parking policies that favor carpools and vanpools, including creating established parking charges for commuter parking, and preferential parking for carpool or vanpool vehicles. Other parking management programs include policies designed to reduce the total number of cars driving to work, such as the reduction of free or low-cost off-street parking at employment centers.

PDA: Priority Development Area. These locations were identified for concentrated development as part of Plan Bay Area, the Metropolitan Transportation Commission's 2040 Regional Transportation Plan for the nine-county Bay Area.

Peak Hour: The highest morning or evening hour of travel reported on a transportation network or street.

PMS: Pavement Management System. Required by Section 2108.1 of the Streets and Highways Code, any jurisdiction that wishes to qualify for funding under the STIP must have a PMS that is in conformance with the criteria adopted by the Joint City/County/State Cooperation Committee.

Preferential Parking: This concept involves assigning the most desirable parking spaces, such as those closest to building entrances, for the exclusive use of carpool and vanpool vehicles. In addition, parking charges may be

partially reduced or eliminated for carpools and vanpool vehicles. These vehicles may also be exempted from any hourly parking limits that exist.

Pre-Tax Commuter Benefit: Federal tax code allows the use of tax-free dollars to pay for transit commuting and parking costs. The monthly benefit amount varies from year to year based on adopted legislation.

Program of Projects: This annual program includes Section 9, Section 3 Rail Modernization (Fixed Guideway Modernization), and STP/CMAQ federal funding for transit projects. MTC is the designated recipient for these federal funds acting on behalf of the individual sponsors.

Proposition 108: Passed by California voters in June 1990, this bond measure provides up to $1 billion for rail projects programmed in the 1990 STIP. (In 1992 and 1994 state voters turned down bond funding measures for projects programmed in the 1990 STIP). The state has continued the original programming of the 1990 STIP, but the failure of funding the additional bond measures has reduced the STIP money available.

Proposition 116: Passed by California voters in June 1990, this bond measure provided $1.9 billion in bonds for rail projects. Requirements for air quality and service integration was included in the legislation, and projects were subject to review by the California Transportation Commission (CTC) before allocation.

PSR: Project Study Report. Chapter 878 of the Statutes of 1987 requires that any project that increases state highway capacity, prior to programming in the STIP, complete a report that has a detailed description of the project scope and estimated costs. The intent of this legislation was to improve the accuracy of the schedule and costs shown in the STIP, and thus improve the overall accuracy of the estimates of STIP delivery and costs.

Quality of Service (QOS): A metric used to evaluate how well a transportation facility serves its users. Several different QOS methodologies are currently used by transportation professionals, often with a focus on bicyclists, pedestrians or transit passengers.

Rail Modernization: This is a federal funded grant under Section 3(h) of the Federal Transit Act. The funds are made available to local transit agencies to improve fixed guideway systems that have been in service for at least seven years.

RHNA: Regional Housing Needs Allocation. The minimum amount of housing that will be needed to support projected housing growth, at all income levels, by the end of the specified allocation period (currently 2006 - 2014).

Ridesharing: Sharing of one vehicle by two or more commuters. While the concept of ridesharing applies primarily to carpools and vanpools, it can be applied to shuttle bus service as well.

RTIP: Regional Transportation Improvement Program. A list of proposed transportation projects submitted to the CTC by the regional transportation-planning agency (for the Bay Area - MTC), as a request for state funding. The individual projects are first proposed by local jurisdictions, and then submitted by the regional agency for submission to the CTC. The RTIP has a four-year planning horizon and is updated every two years.

RTP: Regional Transportation Plan. A multimodal blueprint to guide the region's transportation development for a 25-year period. Updated every four years, it is based on projections of growth and travel demand coupled with financial assumptions. Required by state and federal law.

SAFETEA LU: Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy of Users. As an offshoot of ISTEA and TEA-21, Congress approved $244.5 billion to fund federal highways, public transportation, highway safety, and motor carrier safety programs for fiscal year 2005 through 2009.

SB-1: The Road Repair and Accountability Act of 2017 – was passed by a two-thirds majority in the California Legislature and signed into law by Governor Jerry Brown. As the largest transportation investment in California history, SB 1 is expected to raise $52.4 billion for transportation investments statewide over the next decade. Most of the funding will be directed to tackling the enormous backlog of maintenance and repairs on local streets, roads and public transit systems. Funding will also be available for mobility improvements and expanding bicycle and pedestrian access.

SB-45: Senate Bill 45 (Kopp) Governor Wilson signed SB-45 into law at the end of the 1997 legislative session. This legislation consolidated several state transportation funding programs into three funding programs and devolved state transportation programming responsibility to the county and MPO level.

SB-375: Senate Bill 375 (Steinberg). This bill became law on January 1, 2009. SB 375 was enacted after AB-32 to help meet the greenhouse gas emission goals of AB 32 by addressing the transportation and land use components of greenhouse gas emissions. SB 375 requires each of the state's 18 metropolitan areas to reduce greenhouse gas emissions from cars and light trucks.

SB-743: Senate Bill 743 (Steinberg). This bill became law in September 2013, and directs the Governor's Office of Planning and Research (OPR) to develop a new approach for analyzing the transportation impacts under CEQA. SB 743 also creates a new exemption for certain projects that are consistent with a Specific Plan and, eliminates the need to evaluate aesthetic and parking impacts of TOD projects, in some circumstances.

SCS: Sustainable Communities Strategy. A requirement of all California MPO's as set forth by SB-375. The SCS is a document that outlines the region's long-range plan for integrating transportation, housing, and land use in order to reduce greenhouse gas emissions.

SHOPP: State Highway Operations and Protection Plan. A program created by State legislation that includes state highway safety and rehabilitation projects, seismic retrofit projects, landscaping, some operational improvements, and bridge replacement. SHOPP is a four-year program of projects adopted separately from the STIP cycle. Both new (Prop 111) and old state gas tax revenues and federal funds are the basis for funding this program. The legislature and Governor have made seismic retrofit the state's highest priority and in practice have used other STIP moneys for these projects.

SIP: State Implementation Plan. A compilation of the federal air quality plans from around the state produced by the state Air Resources Board.

SOV: Single Occupancy Vehicle. A motor vehicle occupied by one employee for commute purposes.

STIP: State Transportation Improvement Program. The STIP is a four-year planning and expenditure plan adopted by the CTC for the State Transportation System, and is updated in even years. The STIP is composed of the approved RTIPs, and Caltrans' ITIP.

STP: Surface Transportation Program. A new flexible funding program established by ISTEA. Many mass transit and highway projects are eligible for funding under this program. Ten percent of the projects in this program must be transportation enhancement projects, and 10% must be safety projects.

TCM: Transportation Control Measure. A measure intended to reduce pollutant emissions from motor vehicles. Examples of TCMs include programs to encourage ridesharing or public transit usage, city or county trip reduction ordinances, and the use of cleaner burning fuels in motor vehicles. MTC has adopted specific TCMs, in compliance with the federal and state Clean Air Acts.

TDA: Transportation Development Account. A state law enacted in 1971, this fund collects ¼ of 1% of all retail sales in each county to fund transit, paratransit, bicycle and pedestrian improvements. The funds are collected by the state and allocated by MTC to fund projects and programs throughout their jurisdiction.

In Santa Clara County, the transit agency is the only eligible applicant for Article 4 allocations, and Article 4.5, which provides funding for community and paratransit services. This provision allows MTC to allocate another 5% of the total TDA funds that Santa Clara County claims for ADA paratransit services. Additionally, Article 3 funds (4% of the total revenue) are allocated annually for bicycle/pedestrian projects, which are nominated by the VTA.

TDM: Transportation Demand Management. This is a term used to describe policies and programs (non-engineering solutions) to reduce the number of cars on the road. Examples of transportation demand management include flextime, ridesharing, and telecommuting.

TEA-21: Transportation Equity Act for the 21st Century. TEA-21 is the successor legislation to ISTEA. Congress enacted TEA-21 in mid-1997. The legislation covers the six-year period 1997/98 to 2002/03, and extends and expands many of the funding programs developed under ISTEA.TEAQ: Transportation Energy and Air Quality (TEAQ). TEAQ is VTA's Program to address Climate Change and energy issues that will involve smarter transportation planning, collaboration with local agencies, pursuit of funding, and the use of alternative fuel sources.

Telecommuting: A system of either working at home or at an off-site workstation with computer facilities that link to the worksite.

TFCA: Transportation Fund for Clean Air. TFCA Funds are generated by a $4.00 surcharge on vehicle registrations. The funds generated by the fee are used to implement projects and programs to reduce air pollution from motor vehicles. Health and Safety Code Section 44241 limits expenditure of these funds to specified eligible transportation control measures (TCMs) that are included in BAAQMD's 1991 Clean Air Plan, developed and adopted pursuant to the requirements of the California Clean Air Act of 1988. BAAQMD manages 60% of the funds via a regional discretionary program. The remaining 40% are returned to each county based on annual vehicle registrations.

TIP: Transportation Improvement Program. A federally required document produced by the regional transportation planning agency (MTC in the Bay Area) that states investment priorities for transit and transit-related improvements, mass transit guideways, general aviation and highways. The TIP is the MTC's principal means of implementing long-term planning objectives through specific projects.

TMA: Transportation Management Association. An organization of developers, property managers, employers and public officials who cooperatively provide and promote programs that mitigate traffic congestion, assist commuters, and otherwise encourage improved travel in a given area.

Transit Priority Area: an area within one-half mile of a major transit stop [see definition above] that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations. (California Government Code 21099 (7))

Transportation Demand Forecasting Model: An analytical tool that predicts travel patterns based upon the spatial relationship between various types of land uses and connecting transportation facilities (e.g., roadways and transit).

Transportation Facility: Any part of the designated CMP System including roadways, intersections, freeways, and bicycle, pedestrian and transit routes.

TRO: Trip Reduction Ordinance. A regulation passed by local government requiring employers, developers, and/or property owners to participate or assist in financing transportation management efforts. In many instances, such ordinances specify a target reduction in the number of vehicle trips expected from a development based on standardized trip reduction rates.

TSM: Transportation Systems Management. The use of low-cost capital improvements to increase the efficiency of road transportation and transit services. TSM measures included changing traffic signal timings to optimize the flow of traffic moving through a roadway section, or installing ramp meters at freeway on-ramps to regulate the number of vehicles entering onto the freeway at one time.

Vanpooling: Commuting in a seven- to 15-passenger van, with driving undertaken by commuters. The riders on a monthly basis usually pay for some portion of the van's ownership and operating cost. The van may be privately owned, employer-sponsored with the company owning and maintaining the vehicle, or it may be provided through a private company that leases vehicles.

Vehicle Employee Ratio: The reciprocal of AVR. A ratio of vehicles arriving at a worksite during the peak period, divided by the number of employees reporting to work on the same day.

Vehicle Occupancy: The number of people riding in a vehicle at one time.

Vehicle Trip: A one-way movement of a vehicle between two points (e.g. origin and destination).

VMT: Vehicle Miles Traveled. A measure of the extent of automobile use within a specific geographic area over a given period of time. Travel demand forecasting (modeling) is typically used to analyze VMT at the project,

countywide and regional levels, although other methods such as spreadsheet analysis may be used for individual projects in some circumstances.

Worksite: Any place of employment, base of operation or predominant location of an employer. All buildings or facilities operated or occupied by the employer within the city and within a radius of 1.5 miles of a single centrally located building or facility operated or occupied by the same employer shall be deemed a worksite.

APPENDICES B – I AVAILABLE UNDER SEPARATE COVER

ACKNOWLEDGEMENTS

PROJECT STAFF

Adam Paranial
Transportation Planner II

John Sighamony
Senior Transportation Planner

Scott Haywood
Transportation Planning Manager

CONTRIBUTING STAFF

Bill Hough
Transportation Planner III

George Naylor
Transportation Planning Manager

Robert Swierk, AICP
Principal Planner

Chris Augenstein, AICP
Director