Congestion Management Program

September 2019

ALAMEDA
County Transportation Commission

Alameda County Transportation Commission
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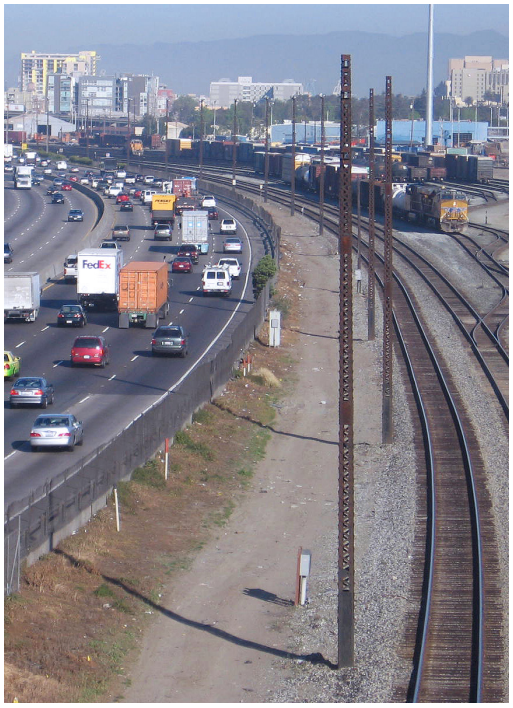

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Executive Summary

ES

Northbound on Interstate 880, Oakland

The 2019 Alameda County Congestion Management Program (CMP) describes strategies and procedures to: (1) measure the performance of the county's multimodal transportation system, (2) address roadway congestion and improve the performance of a multimodal system, and (3) connect transportation and land use planning.

The 2019 update to the CMP meets a state legislative mandate, established in 1991, which requires Congestion Management Agencies (CMAs) to update their CMP every two years. However, current CMP legislation is in conflict with other regulations like Senate Bill 743 (SB 743), the California Environmental Quality Act (CEQA), Complete Streets legislation, and current industry best practices. To resolve this conflict, existing CMP legislation must be amended to align with other more recent regulations.

The metric used to measure performance is at the heart of this conflict. CMP legislation requires use of a delay-based metric, Level of Service (LOS), to measure roadway performance. However, recently amended CEQA guidelines based on SB 743 require vehicle miles-traveled (VMT) as the primary metric for traffic impacts. This move away from LOS to VMT supports Greenhouse Gas (GHG) reduction goals, multimodal performance measurement, and is in line with the Complete Streets practice.

Until this conflict is resolved through amended CMP legislation, Alameda CTC will not produce a major update to the CMP. Instead, Alameda CTC made focused changes during this 2019 update to report on the work performed by Alameda CTC and progress made to implement the major CMP elements since the last update in 2017.

California's current CMP legislation defers considerable authority to the CMAs to develop and update each CMP but requires CMAs incorporate five key elements: (1) level of service monitoring of a designated roadway network (see chapters 2 and 3); (2) a multimodal performance element (chapter 4); (3) a travel demand management element (chapter 5); (4) a land use analysis program (chapter 6); and (5) a capital improvement program (chapter 8).

For all CMP updates, Alameda CTC coordinates with the Metropolitan Transportation Commission (MTC), transit agencies, local governments, the California Department of Transportation (Caltrans), and the Bay Area Air Quality Management District (BAAQMD). Following the adoption of the 2019 CMP by the Alameda CTC Commission, Alameda CTC will submit the CMP to MTC. As the regional transportation planning agency in the San Francisco Bay Area, MTC is required to evaluate the CMP's consistency with MTC's Regional Transportation Plan (RTP) and with the CMPs of the other counties in the Bay Area. If the Alameda County CMP is found to be

consistent with the RTP, MTC will incorporate the projects listed in the CMP's Capital Improvement Program into MTC's Regional Transportation Improvement Program.

Alameda CTC's CMP is designed to meet and exceed the legal requirements and address many of the county's multimodal transportation challenges in doing so.

Senate Bill 743

The Governor's Office of Planning and Research (OPR) was tasked with implementing SB 743 and identified the new metric to be vehicle miles traveled (VMT) and has also developed guidance for implementing the new metric, working with stakeholders across the state. Alameda CTC actively participated in this process by leading the Bay Area Working Group in 2015 and 2016 to coordinate with the OPR. Based on the outcome of OPR's efforts, the CEQA Guidelines regarding transportation impact assessment was amended to use VMT as the new metric in December 2018. It becomes mandatory on July 1, 2020.

Alameda CTC, as the CMA and Sales Tax Agency for Alameda County, is currently engaged in developing consistent countywide guidelines to implement the VMT metric for land use and transportation projects for CEQA purposes for use by all member agencies as well as for Alameda CTC.

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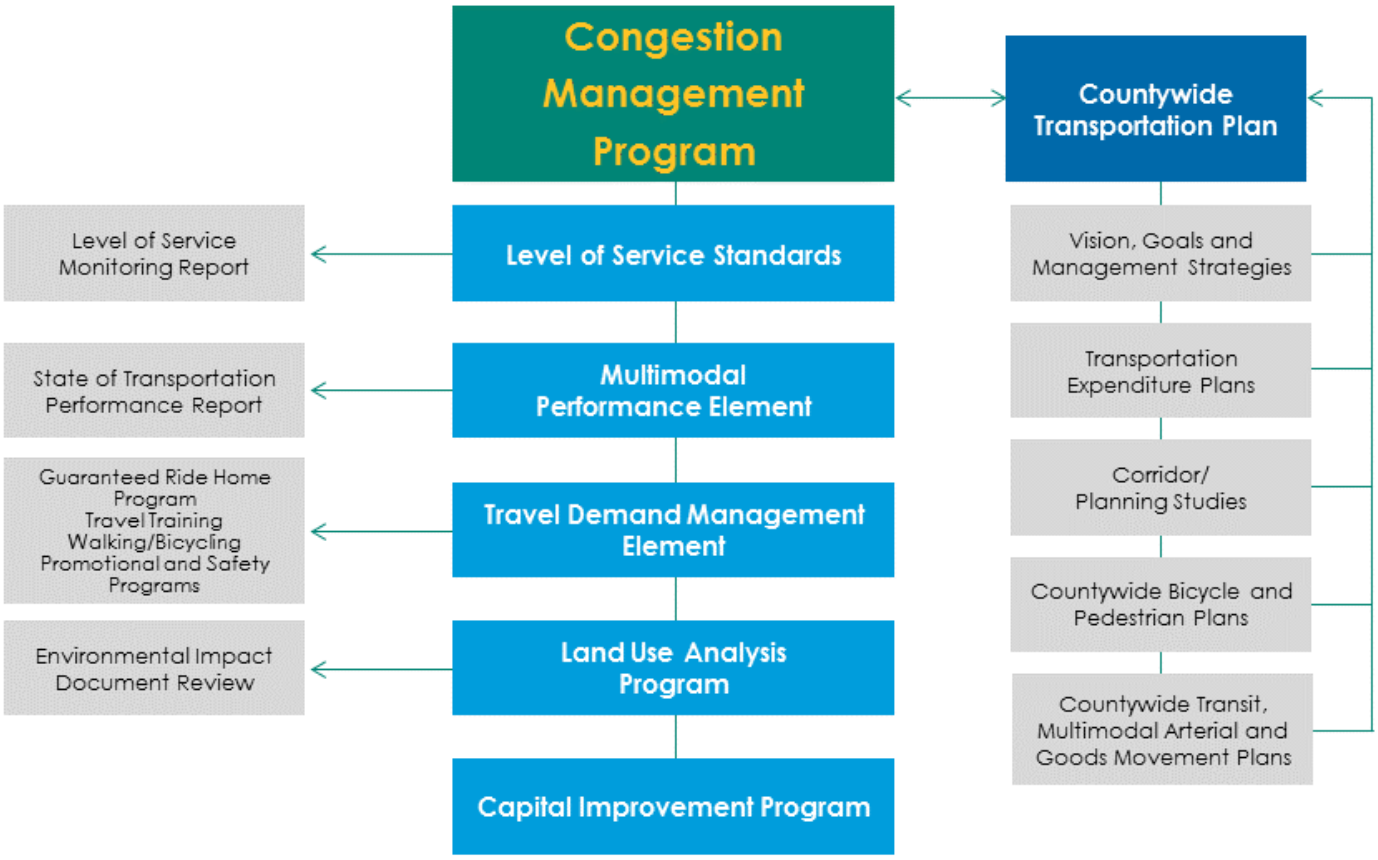
Figure ES1—CMP and Five Major Elements



The Transportation System

Alameda CTC must define and identify components of the transportation system that are being monitored and improved. For the purposes of the CMP, two different systems are used: the designated CMP roadway network, last updated in 2017 (Chapter 2, "Designated CMP Roadway Network") and the broader and older Metropolitan Transportation System (MTS). The CMP roadway network is generally a subset of the MTS.[1] Alameda CTC monitors performance in the CMP roadway network in relation to established level of service standards. Alameda CTC also uses the MTS in the Land Use Analysis Program (Chapter 6).

Designated CMP Roadway Network

The designated CMP roadway network was initially developed in 1991 and includes freeways, state highways, and principal arterials that meet criteria defined in the CMP. These roadways are significant for regional trips and connect major activity centers to the regional transportation system.

In 2011, recognizing the need to expand the CMP network to reflect the changes in land use patterns over the years, the Alameda CTC Commission adopted a two-tier approach for the CMP network in Alameda County. The first tier (Tier 1) is the original CMP network including freeways, highways, and principal arterials. The second tier (Tier 2) includes additional arterial roadways of countywide significance. Alameda CTC monitors the Tier 1 network for informational purposes only and is not used in the conformity findings process.

In 2017, Alameda CTC expanded the Tier 2 CMP network and adding another 220 miles of arterial roadways based on the outcome of the three countywide modal plans, the Countywide Multimodal Arterial Plan, Countywide Transit Plan, and Countywide Goods Movement Plan. Additionally, Alameda CTC identified 146 miles of roadways on major transit corridors to be included in a new transit performance monitoring network.

MTS System

A regionally designated system, MTS typically includes the entire CMP network, as well as major arterials, transit services, rail, maritime ports, airports, and transfer hubs critical to the region's movement of people and freight.[2] MTS roadways were originally developed in 1991 and updated in 2005 and include roadways recognized as "regionally significant" and all interstate highways, state routes, and portions of the street and road system operated and maintained by local jurisdictions.

LOS Monitoring

As previously mentioned, current CMP legislation requires level of service standards be established to monitor performance on the CMP roadway network. Legislation requires a delay-based matric, but does leave the specific measurement methodology to each CMA so long as that methodology is compliant with the most recent version of the Transportation Research Board's Highway Capacity Manual (HCM) or another uniform methodology adopted by the CMA. Under the HCM methodology, LOS is represented with letter designations, ranging from A to F. LOS-A represents free-flow conditions, and LOS-F represents congested conditions. The CMP legislation requires a standard of LOS-E for all CMP roads that are subject to CMP conformance[3].

[1] With the expansion to the CMP network in the 2017 Update, the CMP network now extends beyond the MTS in many parts of the county.

[2] In Alameda County, with the addition and subsequent expansion of Tier 2 routes, in the 2017 CMP Update, the CMP network is in many locations outside of MTS roadways.

[3] Tier 1 roadways at the PM-peak period only

Alameda CTC uses LOS standards as defined in the 1985 Highway Capacity Manual (HCM 1985), the nationally accepted guidelines published by the Transportation Research Board. Alameda CTC re-evaluated the applicability of these standards in 2005 and again in 2013. The 2013 showed that using a more recent version of the HCM would hinder the ability to compare past performance trends, important for determining conformity with CMP legislation. The HCM 2000 and 2010 both require a density-based, rather than speed-based LOS methodology for freeways and changed speed classifications for arterials, which would hinder the ability to compare past performance trends important for determining conformity with the CMP.

Based on this review, Alameda CTC continues to use the speed-based LOS methodology in the HCM 1985 to monitor freeways and existing roadway classifications for arterials for the Tier 1 roadway network, which is subject to the conformity process. Since the Tier 2 network is monitored for informational purposes only and is not comparable to any previous performance data, LOS has been reported using the methodologies in both the HCM1985 and HCM2000 since the 2014 LOS Monitoring Study.

Alameda CTC conducts an LOS monitoring study every two years. The last study was conducted in the spring of 2018, and the next will be in 2020. The 2018 LOS Monitoring study was the first to include the expanded Tier 2 network and a transit monitoring network, making it the first multimodal monitoring study.

Multimodal Performance Element

The CMP must contain performance measures that evaluate how freeways, highways, and roads function. The CMP describes the frequency, routing, and coordination of transit services within Alameda County and establishes performance measures that support mobility, air quality, land use, and economic objectives. The performance element, consistent with legislation, includes performance measures for all modes. However, only the auto LOS standards trigger a deficiency plan under the CMP.

Combined with LOS standards, the multimodal performance element provides a basis for evaluating whether the transportation system is achieving the broad mobility and congestion management goals in the CMP. These include developing the Capital Improvement Program, analyzing land use impacts, and preparing deficiency plans to address problems.

These performance measures help comprehensively evaluate the performance of the countywide multimodal transportation system and measure progress towards agency goals. Alameda CTC prepares an annual transportation system Performance Report.

Local agencies are encouraged to provide data to MTC or to maintain their own database of maintenance needs on the MTS. However, there is no compliance requirement for local agencies or transit operators related to the multimodal performance element.

The most recent performance report, the 2018 Performance Report for fiscal year 2017-18, is available on the Alameda CTC website and will be updated in November 2019.

Travel Demand Management Element

Travel demand management (TDM) measures seek to reduce pressure on existing roadway infrastructure and parking capacity by using incentives and disincentives to influence travel choice. Ideally, TDM measures reduce both peak-period vehicle trips and total vehicle miles traveled which reduces reducing congestion, carbon emissions, improves public health, and widens viable transportation choices.

The most effective TDM programs include some form of financial incentive, either through pricing parking, subsidizing transit fares, ridesharing, etc. TDM strategies can provide a cost-effective way to meet regional

sustainability and mobility goals. By making the most efficient possible use of available system capacity, they complement the region's investments in high-occupancy vehicle lanes, express lanes, transit systems, first- and last-mile solutions, multimodal infrastructure improvements and other alternatives to single-occupant driving.

The Commission adopted a Countywide Comprehensive TDM Strategy in May 2013 that provides an inventory of the broad range of TDM programs and activities present in Alameda County and recommends a strategy for better integrating, supporting, and building on these existing efforts, including implementation of the regional commute benefit program and the Guaranteed Ride Home Program. These programs are designed to make the most efficient use of existing facilities. The TDM element also incorporates strategies to integrate air quality planning requirements with transportation planning and programming. Funding generally comes from the Transportation Fund for Clean Air (from motor vehicle registration fees) and from the federal Surface Transportation Program and Congestion Mitigation and Air Quality Program. Alameda County's TDM element represents a fiscally realistic program that effectively complements the overall CMP.

A balanced TDM element requires actions that local jurisdictions, Alameda CTC, BAAQMD, Caltrans, MTC, and local transit agencies undertake. As required by state law, the Alameda County TDM program promotes alternatives to single-occupant vehicle travel (e.g., carpools, vanpools, transit, bicycles, park-and-ride lots); promotes improvements in the jobs-housing balance and transit-oriented developments; promotes other strategies, including flexible work hours, telecommuting, and parking management programs; and considers parking "cash out" programs (paying employees who do not use parking).

Chapter 5, "Travel Demand Management Element" includes a variety of tools available to local governments for facilitating TDM. To be found in conformance with this element of the CMP, local jurisdictions must adopt and implement the Required Program by September 1 of each year.

Land Use Analysis Program

The CMP incorporates a program to analyze the impact of land use decisions, made by local jurisdictions, on the regional transportation systems. The intent of this legislatively required component of the CMP is to:

- Coordinate local land use and regional transportation-facility decisions;
- Assess the impacts of development in other communities; and
- Promote information sharing between local governments when a decision made by one jurisdiction impacts another.

While the Alameda CTC's Land Use Analysis Program was initially developed as a program to meet the CMP legislative mandate, the growing focus at all levels of governments on improved coordination between land use and transportation planning has resulted in the program's evolution. In this context, the Alameda CTC's Land Use Analysis Program (Chapter 6) currently includes:

- Legislatively required review of land use actions of local jurisdictions by Alameda CTC to ensure that impacts on the regional transportation system are disclosed and mitigation measures are identified;
- Land use projections from the Regional Planning Agency for use in countywide model database by local jurisdictions;
- Planning initiatives and programs that foster transportation and land use connections; and
- Strategic monitoring of transportation-land use coordination performance measures.

Although land use remains the purview of local governments, Alameda CTC reviews impacts to the regional transportation network and can act to withhold

the gas tax subventions if local agencies do not conform to the requirements of the CMP.

The CMP requires local jurisdictions to regularly:

- Forward to Alameda CTC all Notices of Preparation, Notices of Availability of Draft and Final Environmental Impact Reports, and Environmental Impact Statements, and Final dispositions of General Plan amendments.
- Analyze large development projects according to the guidelines in Chapter 6. Land Use Analysis Program of the CMP, including the use of the Alameda Countywide Travel Demand Model or an approved subarea model and disclosure of impacts to the MTS.
- Work with Alameda CTC to mitigate development impacts on the regional transportation system.

As part of the annual conformity process, Alameda CTC requires local jurisdictions to:

- Demonstrate to Alameda CTC that the Land Use Analysis Program is being carried out.
- Provide the Alameda CTC with 1) a list of land use development projects approved during the previous fiscal year; and 2) a copy of the most recent Housing Element Annual Progress Report submitted to the state Department of Housing and Community Development. Starting in 2014, Alameda CTC has used this information to develop a database of land use approvals for enhanced monitoring of transportation-land use coordination and planning.

During travel demand model updates:

- Provide an update (prepared by the jurisdiction's planning department) of the anticipated land use changes likely to occur using the most recent MTC/Association of Bay Area Government forecast for a near-term and long-term horizon year. This land use information should be provided in a format compatible with the Countywide Travel Demand Model.

Many action items identified in past CMP updates for a further enhanced Land Use Analysis Program will continue to be valid unless modified by any potential legislative efforts. Therefore, Alameda CTC continues to carry them forward, so that based on the resource availability and coordination with other efforts of Alameda CTC, they can be implemented. Alameda CTC will modify the Land Use Analysis Program when legislative actions are finalized.

Database and Travel Demand Model

Alameda CTC has developed a uniform land use database for use in the countywide travel model. The database and travel demand model bring to the congestion management decision-making process a uniform technical basis for analysis. This includes consideration of the benefits of transit service and TDM programs, as well as projects that improve congestion on the CMP network. The model is also intended to assist local agencies in assessing the impacts of new development on the transportation system.

The most recent update to the Countywide Travel Demand Model was completed in May 2018. It incorporates land use assumptions based on the Sustainable Communities Strategy and RTP, Plan Bay Area 2040. Projections of socioeconomic variables were incorporated for the traffic analysis zones defined for Alameda County. By aggregating the projections made for each zone, Alameda CTC produced projections of socioeconomic characteristics for unincorporated areas of the county, the 14 cities, and for the four planning areas.

See Chapter 7, "Database and Travel Demand Model" for details.

Capital Improvement Program

The Capital Improvement Program reflects Alameda CTC's efforts to maintain or improve the performance of the multimodal transportation system for the movement of people and goods and to mitigate regional transportation impacts identified through the Land Use Analysis Program.

Per federal requirements, Alameda CTC considers various multimodal methods to improve the existing system, such as traffic operations systems, arterial signal timing, parking management, transit transfer coordination, and transit marketing programs.

Projects selected for the Capital Improvement Program are consistent with the assumptions, goals, policies, actions, and projects identified in PBA 2040.

Starting in 2013, Alameda CTC adopted a Strategic Planning and Programming Policy that consolidates existing planning and programming processes to improve the efficiency and effectiveness of future policy decisions on transportation investments. This policy resulted in the Comprehensive Investment Plan (CIP).

Alameda CTC's CIP serves three purposes:

- **Translates long-range plans into short-range implementation** by focusing on project/program delivery over a five-year programming window with a two-year allocation plan.
- **Serves as Alameda CTC's strategic plan** for voter-approved transportation funding (such as 1986 Measure B, 2000 Measure B, 2010 Vehicle Registration Fee, and 2014 Measure BB) as required by the respective legislation for each funding program.
- **Establishes a comprehensive and consolidated programming and allocation plan** for fund sources under Alameda CTC's authority for capital improvements, operations, and maintenance projects and programs.

Each year, Alameda CTC's CIP financial assumptions are updated to include the latest revenue projections. New projects and programs are considered through updates of the CIP, generally occurring every two years.

Every two years, as needed, Alameda CTC comprehensively updates the CIP to review existing CIP projects and to open a nomination window for new projects. The biennial update occurs on odd number fiscal years and represents a shift of the programming window to add the next two fiscal years. Biennial CIP updates also include review of existing projects and programs to determine whether to recommend continuing or postponing funding and delaying, removing, or reincorporating projects/programs. Alameda CTC may recommend additional funding to continue existing approved projects.

Projects submitted during the nomination window that meet the Commission-adopted screening criteria will be evaluated and prioritized for funding consideration. The full update will involve notifying project sponsors of the enrollment period for adding new projects and programs to the CIP, and the subsequent review and approval of project and program submittals to be included in the updated CIP.

The CMP's Capital Improvement Program also includes the list of projects for the State Transportation Improvement Program (STIP) for Alameda County, as required by the CMP legislation. The 2020 STIP projects will be presented to the Alameda CTC Commission for approval in October 2019 for a total funding request of $34.7 million. This list, once approved, will be forwarded to MTC as part of the 2019 CMP submittal for inclusion in to the region's Regional Transportation Improvement Program (RTIP). Upon approval, MTC will forward the region's RTIP projects list to the California Transportation Commission for adoption into the 2020 STIP.

Program Conformance and Monitoring

Alameda CTC is responsible for ensuring local government conformance with the CMP and annually monitors the implementation of four elements: LOS standards on CMP network, travel demand management including implementation of the Required Program, the Land Use Analysis Program, and the Capital Improvement Program. Alameda CTC ensures local agencies are in conformance with CMP requirements for these elements.

To assist local jurisdictions, Alameda CTC provides LOS standards resources (Chapter 3, "Level of Service Standards"); travel demand management resources and countywide programs to facilitate implementation of the Required Program (Chapter 5, "Travel Demand Management Element"); and a database and Countywide Travel Demand Model (Chapter 7, "Database and Travel Demand Model"). Alameda CTC has also developed a Land Use Analysis Program (Chapter 6) for implementation by local agencies, which remain responsible for approving, disallowing, or altering projects and land use decisions. The program must be able to determine land development impacts on the regional transportation system/MTS and formulate appropriate mitigation measures commensurate with the magnitude of the expected impacts.

In addition, Alameda CTC is required to prepare and biennially update a Capital Improvement Program (see Chapter 8, "Capital Improvement Program") aimed at maintaining or improving transportation service levels. Each city, the county, transit operators, and Caltrans provide input for these biennial updates.

As part of Alameda CTC's annual monitoring, if it finds a local jurisdiction in non-conformance with the CMP, it will notify the local jurisdiction, which then has 90 days to remedy the area(s) of non-conformance. If the local jurisdiction fails to provide a remedy within the stipulated time, it may lose local, state, and/or federal funding (see Chapter 9, "Program Conformance and Monitoring" for more information).

Deficiency Plans

CMP legislation requires preparation of deficiency plans when a CMP roadway segment does not meet the adopted level of service standard, which is LOS E for Alameda County CMP roadways, or is not otherwise exempt. Local jurisdictions must develop a deficiency plan to achieve the adopted LOS standards at the deficient segment or intersection, or to improve the LOS and contribute to significant air-quality improvements.

Local governments are responsible for preparing and adopting deficiency plans by working with Alameda CTC, appropriate local jurisdictions, and regional agencies including local transit providers regarding the deficient roadway segment as detailed in Chapter 10, "Deficiency Plans."

Conclusions and Future Considerations

The CMP has several interrelated elements intended to foster better coordination among decisions about land development, transportation, and air quality. Several conclusions can be reached about the CMP relative to the requirements of law and its purpose and intent (Chapter 11, "Conclusions and Future Considerations"). Legislative efforts are anticipated that will reform and update the CMP guidelines and requirements. Once legislation is amended, Alameda CTC will update its approach to future CMPs to align with the updated requirements.

Program Overview

1

Multimodal activity in downtown Oakland

California law requires urban areas to develop and biennially update a "congestion management program," or CMP—a plan that describes the strategies to assess and monitor the performance of the county's multimodal transportation system, address congestion and improve the performance of a multimodal system, and strengthen the integration of transportation and land use planning. As the congestion management agency (CMA) for Alameda County, the Alameda County Transportation Commission (Alameda CTC) prepares the CMP. Alameda CTC coordinates with the Metropolitan Transportation Commission (MTC), transit agencies, local governments, the California Department of Transportation (Caltrans), and the Bay Area Air Quality Management District (BAAQMD) to manage and update the CMP.

Alameda CTC is a joint powers authority (JPA) that is a result of the July 2010 merger of the Alameda County Congestion Management Agency and the Alameda County Transportation Improvement Authority.

Alameda County's Congestion Management Agency

Alameda CTC performs congestion management activities, coordinates countywide transportation planning, and attracts federal, state, and local funding for project and program implementation (see Appendix A for full CMP legislation).

In addition, as the sales tax authority for Alameda County, Alameda CTC delivers the Expenditure Plans for Measure B passed in 2000, the Vehicle Registration Fee (VRF) passed in 2010, and Measure BB passed in 2014 to fund a variety of transit, bicycle and pedestrian, highway and local roadway, and freight projects, as well as special transportation programs for seniors, youth, and people with disabilities.

Alameda CTC's mission is to plan, fund, and deliver transportation programs and projects that expand access and improve mobility to foster a vibrant and livable Alameda County.

Key Responsibilities

To help guide and improve Alameda County's transportation system, Alameda CTC's key responsibilities are carrying out the following three activities:

- Developing plans that guide transportation development and funding decisions, including the Congestion Management Program;
- Programming funds to agencies for transportation improvements; and

- Delivering the projects, programs, legislative actions, and policy efforts set forth in the planning and programming documents.

As the congestion management agency, Alameda CTC also has the following functions and responsibilities to:

- Coordinate transportation planning and funding programs within Alameda County and with contiguous counties;
- Coordinate countywide input to:
  - California Clean Air Act and Transportation Control Measures of MTC and BAAQMD;
  - MTC's Regional Transportation Improvement Program; and
  - California Transportation Commission State Transportation Improvement Program (STIP);
- Prepare, adopt, update, and administer federal funding programs for Alameda County including the Surface Transportation Program and the Congestion Mitigation and Air Quality Program;
- Levy and collect fees and charges, including administrative and operating costs; and
- Recommend projects for funding from the Alameda County share of the STIP.
- The Commission also oversees project implementation to ensure that projects meet "timely use of funds" requirements and that no programmed funds are lost from Alameda County.

In addition, Alameda CTC acts as the program manager for the Transportation Fund for Clean Air (TFCA) in Alameda County. The TFCA program, which aims to reduce pollution by reducing the use of single-occupant vehicles, is funded through a $4 per-vehicle registration fee and is managed by BAAQMD. The law requires BAAQMD to allocate 40 percent of the revenue to each county. Other functions could be added by amendments to the JPA or by actions of the state or federal government.

Governance

Under a joint powers agreement, elected officials from throughout Alameda County—representing each city in the county, the County of Alameda, Alameda-Contra Costa Transit District (AC Transit), and the San Francisco Bay Area Rapid Transit District (BART)—govern Alameda CTC. The 22-member Commission considers the interests of local constituents and helps to include all areas of the county in guiding how Alameda CTC plans, funds, and delivers projects and programs throughout Alameda County. The Commission's leadership from throughout the county ensures all residents are represented.

Advisory Committees

Alameda CTC relies on the guidance and direction of a number of advisory committees (see Appendix D for detail on the standing committees):

- Alameda County Technical Advisory Committee
- Bicycle and Pedestrian Advisory Committee
- Independent Watchdog Committee, formerly the Citizens Watchdog Committee
- Paratransit Advisory and Planning Committee

Alameda County Congestion Management Program

The Alameda County CMP is a short-range plan that includes a variety of congestion management strategies, programs, and projects that meet the legislative requirements and intend to further improve the countywide transportation system to better meet the needs of all users. It also supports implementation of the long-range Countywide Transportation Plan (CTP) and helps to move the programs and projects included in the CTP closer to reality. The CTP is supported by the Alameda County Transportation Expenditure Plans for Measure B, Measure BB, and Vehicle Registration Fee funding.

The CTP is informed by the adopted Countywide Active Transportation Plan and three adopted major modal plans: the Alameda County Goods Movement Plan, the Countywide Multimodal Arterial Plan, and the Countywide Transit Plan.

Countywide Transportation Plan

Alameda CTC last updated and adopted the CTP in May 2016 and is in the process of developing a new 2020 CTP. The plan is a long-range policy document that guides decisions and articulates the vision for the county's transportation system over typically a 25-30-year planning horizon. Through its funding allocation program, the 2016 CTP seeks to ensure that transportation investments—over a 25-year planning period—are efficient and productive, and that maintenance and management of the system remain high priorities.

Specifically, the CTP:

- Documents existing and future transportation conditions;
- Coordinates countywide input to MTC guidelines for county transportation plans pursuant to Government Code Section 66531;
- Coordinates countywide input to the Regional Transportation Plan and Sustainable Communities Strategy, known as Plan Bay Area;
- Addresses all modes of transportation from goods movement to bicycle and pedestrian priorities to transportation needs for seniors and people with disabilities;
- Provides a strategy to guide transportation improvements to address changes in the regulatory and financial environment;
- Lays the groundwork for an investment program tailored to the diverse needs of the county's residents, visitors, and workers; and
- Identifies projects and programs for implementation over the next 25 or more years.

Transportation Expenditure Plans

The sales tax expenditure plans (Measure B and Measure BB) are key sources of funding for multimodal transportation projects and programs in Alameda County. Measure B was approved by the voters in 2000, and a previous measure was approved in 1986. Of the total collected funds under Measure B, 60 percent are dedicated to programs such as local streets and roads repair, bicycle and pedestrian safety, and transit and paratransit operators, and 40 percent of collected funds are dedicated to capital projects including transit and highway improvements.

Measure BB was approved by voters in 2014 and renewed and increased the existing Measure B half-cent county transaction and use tax for transportation by an additional half cent for 30 years. Measure BB will contribute nearly $8 billion to transportation improvements throughout the county. Alameda CTC will distribute approximately 65 percent of the net sales tax revenues to essential programs in Alameda County through direct local distribution funds and discretionary grant awards. The remaining transportation sales tax dollars (approximately 35 percent) are identified for specifically named projects as described in the 2014 Transportation Expenditure Plan (TEP).

The TEP also serves as a mechanism to fund a portion of select projects and programs identified in the CTP. See Chapter 8 for detail on the percentage of funding for each direct local distribution program, for the discretionary programs, and fund distribution for capital projects, as well as information on the Comprehensive Investment Plan that brings long-range and countywide plans into the near term by focusing on investments over a five-year programming and allocation window.

Purpose of CMP

The CMP sets forth fundamental congestion management strategies for implementing the long-range CTP. It brings together under one umbrella multiple efforts undertaken by Alameda CTC. The CMP addresses day-to-day congestion problems including:

- Setting level of service standards for roadways;
- Identifying multimodal performance measures to evaluate the performance of the countywide transportation system;
- Exploring ways to manage travel demand and identify TDM strategies for trip reduction and air quality improvement;
- Analyzing the impacts of land development on the regional transportation system and implementing the Alameda County Priority Development Area Investment and Growth Strategy;
- Developing and maintaining a travel demand model to provide a technical basis for analysis and assess the impact of local land development on the regional transportation system;
- Developing a Capital Improvement Program that helps improve and maintain the countywide multimodal transportation system;
- Monitoring conformance of required CMP elements implementation by local agencies; and
- Identifying development of deficiency plans and monitoring their implementation by local governments to improve performance of non-conforming transportation systems.

While the CMP is designed to meet the requirements of the law, to ultimately reduce congestion and greenhouse gas emissions, and to improve the ability of people and goods to move on the countywide multimodal transportation system, it also serves as an opportunity for strategic thinking to better integrate land use and transportation through collaboration with various local, regional, and state agencies, and develop transportation strategies and plan for land development that efficiently uses the transportation system, while ensuring it meets the mobility and access needs of residents and workers in Alameda County.

Organization

The CMP is organized into 11 chapters, with supporting appendices:

- Executive Summary
- Chapter 1, Program Overview
- Chapter 2, Designated CMP Roadway Network
- Chapter 3, Level of Service Standards
- Chapter 4, Multimodal Performance Element
- Chapter 5, Travel Demand Management Element
- Chapter 6, Land Use Analysis Program
- Chapter 7, Database and Travel Demand Model
- Chapter 8, Capital Improvement Program
- Chapter 9, Program Conformance and Monitoring
- Chapter 10, Deficiency Plans
- Chapter 11, Conclusions and Future Considerations

Alameda CTC updates the CMP biennially, and the next update will occur in 2021. As indicated in the Executive Summary, legislative efforts anticipated or underway such as Senate Bill 743 will reform and update the CMP guidelines and requirements and will impact some or all of the elements of the CMP. Alameda CTC will update its approach to future CMPs to align with the updated requirements.

Designated CMP Roadway Network

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Davis Street and East 14th Street, San Leandro

The primary objective of designating a CMP roadway network is to monitor performance in relation to established level-of-service (LOS) standards. If adopted standards are not maintained on a specific roadway in the designated system, actions must be taken to address problems, or delivery plans must be developed to improve the overall LOS of the system and improve air quality. To effectively manage congestion on Alameda County's transportation system, Alameda CTC has identified the components of Alameda County's CMP-designated roadway network, considered the core transportation network for the county.

California law requires that, at a minimum, the designated roadway system include all state highways and principal arterials.[4] Highways or roadways designated as part of the system cannot be removed from the system. The statutes also refer to the regional transportation systems as part of the required Land Use Analysis Program.[5] In the 1991 Alameda County CMP, the roadway system designated in the CMP was presumed to be the highway/street component of the regional transportation system. This changed with the passage of the federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA required the Metropolitan Transportation Commission (MTC) to develop a Metropolitan Transportation System (MTS)[6] that included both transit and highways. When the MTS was developed in 1991, it included roadways recognized as "regionally significant" and included all interstate highways, state routes, and portions of the street and road system operated and maintained by local jurisdictions.

MTC coordinated with the congestion management agencies (CMAs) in the Bay Area to develop the MTS and to use the CMPs to link land-use decisions to the MTS. The 1993 Alameda County CMP made a distinction between the CMP network and the MTS:

- The CMP network is used to monitor conformance with the level of service (LOS) standards; and
- The MTS[7] network is used for the Land Use Analysis Program.

[4] California Government Code Section 65089(b)(1)(A).

[5] California Government Code Section 65089(b)(4).

[6] MTS prior to 2005.

[7] In 2005, MTC updated the MTS to include Rural Major Collector streets and higher based on the Federal Functional Classification System. The updated MTS is used by MTC for the purposes of funding and programming as well as in estimating roadway maintenance needs. The updated MTS was reviewed by the Commission during the 2009 CMP update to determine its usefulness and applicability to the Land Use Analysis Program. Based on this input and discussions with MTC, it was determined that the updated MTS was not appropriate for the Land Use Analysis Program, because it was too detailed for planning purposes and the previous version of the MTS would continue to be used.

MTC removed the reference to the MTS starting in its September 2014 Countywide Transportation Plan guidelines. Given the regional significance of the MTS and its historical use for the CMP Land Use Analysis Program, the 2015 CMP and 2017 CMP maintained reference to the separate MTS.

Alameda CTC's long-range Countywide Transportation Plan is the primary vehicle for coordination with the MTS. Since MTC has removed the reference to the MTS in the September 2014 CTP guidelines, the role of the MTS for the purposes of CMP will need to be evaluated in the next CMP update as part of the planned CMP overhaul then. Since 2011, the CMP network has been expanded to monitor a larger network in the county to better capture the land development that occurred since 1991, and the 2019 CMP will evaluate the use of the larger CMP network for the Land Use Analysis Program rather than the MTS.

Designated CMP Network

The Alameda County CMP roadway network was initially adopted in 1991 by the local CMA, based on CMP legislation. Since the adoption of the CMP network, land use and transportation patterns across the county have changed significantly; however, until 2011, the CMP network had very limited expansion with only the addition of Hegenberger Road between I-880 and Doolittle Drive near Oakland Airport in 2007.

Recognizing the need to expand the CMP network to reflect changes in land use patterns over the years, the Alameda CTC Commission discussed various options in 2011 and adopted an expanded two-tier CMP network. The first tier (Tier 1) is the original adopted CMP network, and the second tier (Tier 2) consists of an expanded number of roadways identified using a set of adopted criteria that reflects the countywide significance. This Tier 2 network forms a supplemental network that Alameda CTC monitors for informational purposes only and is not used in the conformity findings process. The 2015 CMP identified as a next step to review and update the CMP network criteria in the 2017 CMP to reflect the outcomes of the three countywide modal plans—the Countywide Multimodal Arterial Plan, the Countywide Transit Plan, and the Countywide Goods Movement Plan. As part of the 2017 CMP update, Alameda CTC developed additional criteria described in the next section that resulted in the addition of approximately 220 miles to the Tier 2 arterial network. The criteria came directly from the modal plans.

The Countywide Multimodal Arterial Plan also identified a series of roadways that have a transit modal priority. These roadways correspond to the highest-ridership bus routes for both AC Transit and LAVTA. As part of the 2017 CMP update, Alameda CTC also identified a transit monitoring network and started monitoring performance on major transit corridors in the 2018 monitoring cycle. This network is comprised of arterial roadways that are a subset of the overall designated CMP.

The characteristics of the CMP-designated network are as follows:

Tier 1:

- Has historically carried the majority of countywide vehicle miles traveled (VMT); and
- It contains 232 miles of roadways, of which 134 miles (58 percent) are interstate freeways, 71 miles (31 percent) are state highways, and 27 miles (11 percent) are city/county arterials.

Tier 2:

- All of the roadways are city/county arterials and of local or countywide significance, and
- It contains 314 miles of roadways.

Transit Monitoring Network:

- These city/county arterials are AC Transit's and LAVTA's major corridors and support operations of the highest-ridership bus routes.

- It contains 146 miles of city/county arterials and is a subset of the designated CMP network.

Criteria for Identifying the CMP Network

The roadway system must be detailed enough to identify significant impacts, yet be manageable for administration. The advantage of designating a relatively detailed CMP roadway system is that it may be easier to establish a link between proposed development projects and their impact on the CMP network. However, too large of a CMP network could become difficult and expensive to monitor. In light of technology advances, the cost for monitoring additional mileage has decreased, but additional staff resources are required to manage performance analysis of a larger network. The following criteria attempt to strike this balance. Alameda CTC will periodically review the effectiveness of these criteria and the CMP network to determine if changes are warranted.

Tier 1 network criteria

The statutes require designation of all state highways and principal arterials as part of the CMP network but do not provide guidance for determining the principal arterials to include. After evaluating several possible methods, an approach was adopted in 1991 for the CMP that provided for the systematic selection of principal arterials to include in the CMP network. The selected approach, which met MTC's expectations for a "reasonable" CMP network designation method, relies on a concept central to the CMP legislation—identifying a system that carries a majority of the vehicle trips countywide.

Using the countywide travel model, an average daily traffic volume was identified that would produce a system of roadways carrying at least 70 percent of the VMT countywide. This approach yielded an average daily traffic of roughly 30,000 vehicles per day as a minimum threshold. Additional criteria were included to refine the definition as described below.

All state highways:

- Must have a minimum threshold of 30,000 vehicles per day.
- Will be evaluated according to the principal arterial criteria, if a route is relocated or removed from the State Highway System, to determine whether it should remain in the CMP network.

Principal arterials must meet all four criteria:

- Must carry 30,000 vehicles per day (average daily traffic) for at least one mile;
- Must be a roadway with four or more lanes;
- Must be a major cross-town connector, traversing from one side of town to the opposite side; and
- Must connect at both ends to another CMP route, unless the route terminates at a major activity center.

Tier 2 network criteria

In 2011, the Commission added 89 miles of roadways (arterials and major collectors) to the CMP network as Tier 2 roadways based on a set of qualitative criteria as follows.

Roadways must meet at least two of the following three criteria to be added to the Tier 2 network. Roadways must be:

- Major thoroughfares, not on the existing CMP network, whose primary function is to link districts within an Alameda County jurisdiction and to distribute traffic from and to the freeways;
- Routes of jurisdiction-wide significance not on the existing CMP network; and
- Streets that experience significant conflicts between auto traffic and transit/other modes.

In 2017, based on the completed countywide modal plans and in coordination with the Alameda County Technical Advisory Committee (ACTAC) and transit agencies, Alameda CTC added four additional criteria for identifying new Tier 2 network roadway segments.

Application of the 2017 CMP Tier 2 criteria resulted in the addition of approximately 220 new Tier 2 miles

Roadways must meet one of the following criteria:

- Higher order facilities (throughways or county connectors[8]) as identified in the Multimodal Arterial Plan.
- Facilities that are AC Transit and LAVTA major corridors as identified in the Multimodal Arterial Plan and consistent with AC Transit's Major Corridor Study and LAVTA's updated Rapid service routes.
- Significant or Tier 2 goods movement routes[9] as identified in the Goods Movement Plan and Multimodal Arterial Plan.
- Rural roadways in East County that have greater than 7,500 annual daily traffic (ADT) according to the Multimodal Arterial Plan.

Transit monitoring network criteria

In 2017, Alameda CTC worked with transit agencies to develop a new network of 146 miles for monitoring transit vehicle performance. To be a part of the transit monitoring network, roadways must meet the following criteria:

- Facilities that carry AC Transit and LAVTA major corridors as identified in the Multimodal Arterial Plan and consistent with AC Transit's Major Corridor Study and LAVTA's updated Rapid service routes.

The transit monitoring network is a subset of the overall CMP. Monitoring began on the new Tier 2 segments in the 2018 monitoring cycle. Note that only Tier 2 segments for which commercial speed data is available will be monitored. Transit vehicle performance was also monitored on the transit monitoring network for the first time as part of the 2018 LOS monitoring cycle.

Process for Adding Potential Roadways

To identify potential roadways to add to the Tier 1 or Tier 2 network, Alameda CTC applies the aforementioned criteria and proposes an updated network for jurisdictions' review.

For the 2017 CMP update, Alameda CTC identified only new Tier 2 roadway segments to be monitored for informational purpose only. These identified new segments were reviewed by the jurisdictions and partner agencies, and their input was incorporated in the updated Tier 2 network. The addition of roadways to the CMP network not identified by Alameda CTC is voluntary for local jurisdictions, particularly for the Tier 1 network in view of the conformity requirements and related funding implications.

Regarding the Tier 1 network criteria, no new roadways have been added since the initial adoption of the CMP network in 1991 and 1992, with the exception of any changes or additions to the state highways (e.g., the SR 84 new alignment in the East County) or freeways that are by default added to the Tier 1 network of the Designated Roadway System, as mandated by state law.

For potential roadways to be added to the Tier 2 network, interested jurisdictions or transit operators could propose a roadway if it meets the Tier 2 criteria. In the 2017 CMP update, Alameda CTC requested and incorporated additions to the Tier 2 network from local jurisdictions and partner agencies. For potential roadways to be added to the transit monitoring network, interested jurisdictions or transit operators could propose a roadway if it meets the transit monitoring network criteria.

[8] As defined in the Multimodal Arterial Plan, throughways carry at least 10,000 ADT and have a majority of volume traveling over 8 miles along the roadway. County connectors carry at least 10,000 ADT and have 45-50 percent of volume traveling over 6 miles along the roadway.

[9] Tier 2 Goods movement corridors are arterials that were first identified in the Countywide Goods Movement Plan as providing intra-county and intercity connectivity and last-mile connection to the Port of Oakland and the Oakland International Airport. The network was subsequently adopted in the Multimodal Arterial Plan and is also reflected in the 2017 CMP network.

Alameda CTC staff performs a review of the proposed roadway additions to the CMP and transit monitoring networks with reference to the adopted criteria and submits a recommendation to the Commission for final approval. In reviewing the proposed addition of new roadways that may meet the criteria, the previously mentioned general approach to defining the CMP network is also considered (i.e., the roadway system must be detailed enough to identify significant impacts, yet be manageable for administration, as too large a network is difficult to manage and expensive to monitor). In addition, traffic data required to perform such a review may be requested from the local jurisdictions or transit agencies, as necessary. In this regard, any traffic counts should be 24-hour traffic counts collected from Tuesday through Thursday of a typical week when schools are in session.

Changes to the CMP Network Since 1991

The following changes were made to the CMP network after its initial adoption in 1991.

Tier 1 network changes: In 2005 and 2007 the following network changes were made:

- In 2003, Caltrans realigned State Route 84 (SR 84) in Livermore from 1st Street to Isabel Avenue-Airway Boulevard. Consequently, the new alignment was added to the CMP network in 2005. The former SR 84 alignment along 1st Street in Livermore was evaluated to see whether it met the principal arterial criteria for retention on the CMP network. Based on the results of the analysis, the 2.2-mile segment between Inman Street and I-580 was retained on the CMP network.
- In 2007, the City of Oakland conducted 24-hour traffic counts on Hegenberger Road between I-880 and Doolittle Drive. The traffic counts collected and other characteristics of the roadway met all the principal arterial criteria for inclusion in the CMP network. Accordingly, a 1.7 mile segment of Hegenberger Road between I-880 and Doolittle Drive was added to the CMP network.

Addition of Tier 2 network: Based on the new criteria approved by the Commission in 2011 for the Tier 2 CMP network, 89 miles of roadways were added during the 2011 CMP update. Additionally, with the expanded Tier 2 criteria and inputs from jurisdictions and partner agencies, Alameda CTC added approximately 220 miles of Tier 2 roadway segments as part of the 2017 CMP update. Alameda CTC will monitor the Tier 2 network only for informational purposes, and it will not be subject to conformity requirements.

Addition of the transit monitoring network: As part of the 2017 CMP Update, Alameda CTC identified 146 miles of arterial roadways that are AC Transit and LAVTA major corridors for the purpose of expanding future CMP monitoring to include transit vehicle performance. These roadways were selected based on their designation as major transit corridors in the countywide modal plans and input from transit agency partners. These roadways are a subset of the Tier 1 and Tier 2 networks.

CMP Network Tier 1 Roadways

Table 2.1 lists the designated Tier 1 CMP network, including all freeways, all state highways, and principal arterials that satisfy the Tier 1 criteria.

During the 2011 CMP update, applying the aforementioned qualitative criteria resulted in the Tier 2 network. The Commission recommended that the criteria for adding roadways to the CMP network be reviewed periodically. Accordingly, Alameda CTC will review the criteria for adding roadways to Tiers 1 and 2 during every other CMP update year. Alameda CTC will conduct this review as part of the next CMP.

Table 2.1—CMP-Designated System, Tier 1 Roadway List

Table 2.1.1—Cities of Albany and Berkeley

Route	From	To	Criteria
SR-123 (San Pablo)	Contra Costa County line	Emeryville city limit	State Route
University Avenue	I-80	Milvia Street	Satisfies criteria
University Avenue	Milvia Street	Shattuck Avenue	Connectivity
Shattuck Avenue	University Avenue	Haste Street	Connectivity
Shattuck Avenue	Haste Street	Derby Street	Satisfies criteria
Adeline Street	Derby Street	MLK Jr. Way	Satisfies criteria
MLK Jr. Way	Adeline Street	Oakland city limit	Satisfies criteria
SR-13 (Ashby Avenue)	I-80	Tunnel Road	State Route
SR-13 (Tunnel Road)	Ashby Avenue	Oakland city limit	State Route
I-80/I-580	University Avenue	Central	State Route

Table 2.1.2—City of Alameda

Route	From	To	Criteria
SR-61 (Doolittle Drive)	Oakland city limit	Fernside Boulevard	State Route
SR-61 (Otis Drive)	Fernside Boulevard	SR-61 (Broadway)	State Route
SR-61 (Broadway)	Otis Drive	SR-61 (Encinal Avenue)	State Route
SR-61 (Encinal Avenue)	SR-61 (Broadway)	Sherman Street	State Route
SR-61 (Central Avenue)	Sherman Street	SR-260 (Webster Street)	State Route
SR-260 (Webster Street)	SR-61 (Central Avenue)	Posey/Webster tubes	State Route
SR-260 (Posey/Webster tubes)	SR-260 (Webster Street)	Oakland city limit	State Route
Atlantic Avenue	SR-260 (Webster Street)	Poggi Street	Satisfies criteria
Atlantic Avenue	Poggi Street	Main Street	Connectivity
Park Street	Oakland city limit	Central Avenue	Satisfies criteria
Park Street	Central Avenue	SR-61 (Encinal Avenue)	Connectivity

Table 2.1.3—City of Hayward

Route	From	To	Criteria
SR-185 (Mission Boulevard	Ashland (unincorporated)	SR-92 (Jackson Street)	State Route
SR-92 (Jackson Street)	I-880	SR-185 (Mission Boulevard)	State Route
SR-238 (Foothill Boulevard)	Ashland (unincorporated)	SR-185 (Mission Boulevard)	State Route
SR-238 (Mission Boulevard)	SR-92 (Jackson Street)	Union City city limit	State Route
A Street	I-880	SR-238 (Foothill Boulevard)	Satisfies criteria
Hesperian Boulevard	San Lorenzo (unincorporated)	Tennyson Road	Satisfies criteria
Tennyson Road	Hesperian Boulevard	SR-238 (Mission Boulevard)	Satisfies criteria
SR-92	San Mateo County line	I-880	State Route
I-880	A Street	Alvarado-Niles	State Route

Table 2.1.4—Cities of Emeryville, Oakland, and Piedmont

Route	From	To	Criteria
MLK Jr. Way	Berkeley city limit	SR-24	Satisfies criteria
SR-123 (San Pablo)	Berkeley city limit	35th Street	State Route
SR-13 (Tunnel Road)	Berkeley city limit	SR-24	State Route
SR-260 (Posey/Webster tubes)	Alameda city limit	I-880	Satisfies criteria
23rd/29th Avenue	Alameda city limit	I-880	Satisfies criteria
SR-77 (42nd Avenue)	I-880	SR-185 (E. 14th Street)	State Route
SR-185 (E. 14th Street)	SR-77 (42nd Avenue)	San Leandro city limit	State Route
Hegenberger Road	I-880	Doolittle Drive	Satisfies criteria
Hegenberger Road	I-880	Hawley Street	Connectivity
Hegenberger Road	Hawley Street	SR-185 (E. 14th Street)	Satisfies criteria
SR-61 (Doolittle Drive)	Alameda city limit	San Leandro city limit	State Route
SR-13	SR-24	I-580	State Route
SR-24	I-980	Contra Costa County line	State Route
I-80	SF County Line	University Avenue	State Route
I-580	I-80	MacArthur Boulevard	State Route
I-880	I-980	Hegenberger Road	State Route
I-980	I-880	SR-24	State Route

Table 2.1.5—City of San Leandro

Route	From	To	Criteria
SR-61 (Doolittle Drive)	Oakland city limit	SR-61/112 (Davis Street)	State Route
SR-61/112 (Davis Street)	SR-61 (Doolittle Drive)	SR-185 (E. 14th Street)	State Route
SR-61 (Broadway)	Otis Drive	SR-61 (Encinal Avenue)	State Route
SR-185 (E. 14th Street)	Oakland city limit	Ashland (unincorporated)	State Route
150th Avenue	Hesperian Boulevard	I-580	Satisfies criteria
Hesperian Boulevard	SR-185 (E. 14th Street)	San Lorenzo (unincorporated)	Satisfies criteria
I-880	Hegenberger Avenue	I-238	State Route
I-580	MacArthur Boulevard	I-238	State Route

Table 2.1.6—San Lorenzo, Castro Valley, and Ashland (unincorporated areas)

Route	From	To	Criteria
SR-185 (Mission Boulevard)	San Leandro city limit	Hayward city limit	State Route
Hesperian Boulevard	San Leandro city limit	Hayward city limit	Satisfies criteria
SR-238 (Foothill Boulevard)	I-238	Hayward city limit	State Route
I-880	I-238	A Street	State Route
I-238	I-880	I-580	State Route
I-580	I-238	I-680	State Route

Table 2.1.7—Cities of Union City, Fremont, and Newark

Route	From	To	Criteria
SR-238 (Mission Boulevard)	Hayward city limit	I-680	State Route
Decoto Road	I-880	SR-238 (Mission Boulevard)	Satisfies criteria
Mowry Avenue	I-880	SR-84 (Peralta Boulevard)	Satisfies criteria
SR-262 (Mission Boulevard)	I-880	I-680	State Route
SR-84 (Thornton Avenue)	I-880	Fremont Boulevard	State Route
SR-84 (Fremont Boulevard)	SR-84 (Thornton Avenue)	SR-84 (Peralta Boulevard)	State Route
SR-84 (Peralta Boulevard)	SR-84 (Fremont Boulevard)	SR-84 (Mowry Avenue)	State Route
SR-84 (Mowry Avenue)	SR-84 (Peralta Boulevard)	SR-238 (Mission Boulevard)	State Route
SR-84 (Niles Canyon)	SR-238 (Mission Boulevard)	I-680	State Route
SR-84	San Mateo County line	I-880	State Route
I-880	Alvarado-Niles	Dixon Landing	State Route
I-680	Scott Creek	SR-238	State Route

Table 2.1.8—Cities of Pleasanton, Dublin, Livermore, and Unincorporated Areas

Route	From	To	Criteria
SR-84 (Vallecitos Road)	I-680	SR-84 (Isabel Avenue)	State Route
SR-84 (Isabel Avenue)	SR-84 (Vallecitos Road)	SR-84 (Kitty Hawk Road)	State Route
SR-84 (Kitty Hawk Road)	SR-84 (Isabel Avenue)	SR-84 (Airway Boulevard)	State Route
SR-84 (Airway Boulevard)	SR-84 (Kitty Hawk Road)	I-580	State Route
1st Street	Inman Street	I-580	Satisfies criteria
I-580	I-680	I-205	State Route
I-680	SR-238	Alcosta Boulevard	State Route

CMP Network Tier 2 Roadways

Table 2.2 lists the designated Tier 2 roadways identified using the adopted qualitative criteria from the 2011 and 2017 CMP updates

Table 2.2—CMP-Designated System, Tier 2 Roadway List

Table 2.2.1—Cities of Alameda, Albany, Berkeley, Emeryville, and Oakland

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Buchanan Street-Marin Avenue	I-80	Arlington/ Del Norte	Albany	4	2.1
Solano Avenue	San Pablo Boulevard	Sutter Street	Albany/Berkeley	5	1.5
W. Grand Avenue to Grand Avenue	I-80	I-580	Oakland	1,2	3.1
12th Street-Lakeshore Avenue	I-980	I-580	Oakland	1,2,3	2.4
Telegraph Avenue	Broadway	Bancroft Way	Oakland, Berkeley	2,3,5	4.4
Broadway	I-880	College Avenue	Oakland	2,3	3.1
College Avenue	Broadway	Bancroft Way	Oakland, Berkeley	1,2,3	2.4
51st Street	Broadway	SR-24	Oakland	1,2	0.8
Shattuck Avenue	Adeline Street	51st Street	Oakland, Berkeley	1,2,3	1.5
Shattuck Avenue	University Avenue	Marin Avenue	Berkeley	5	1.3
Bancroft Way	College Avenue	Shattuck	Berkeley	2,3	0.7
Durant Avenue	Shattuck Avenue	College Avenue	Berkeley	4	0.7
Gilman Street	I-80	San Pablo Boulevard	Berkeley	4	0.6
Martin Luther King Jr Way	Marin Avenue	Adeline Street	Berkeley	4	2.7
Claremont Avenue	Telegraph Avenue	Ashby Avenue	Berkeley	4	1.6

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Powell Street-Stanford Avenue	I-80	Martin Luther King Jr. Way/ Adeline Street	Emeryville, Berkeley	1,2	2.2
40th Street-Shellmound Avenue	Broadway	Powell Street	Emeryville, Oakland	1,2,3,5	2.8
Broadway	College Avenue	SR-24	Oakland	6	0.9
Bush Street	San Pablo Avenue	7th Street	Oakland	4	0.9
Castro Street	7th Street	San Pablo Avenue	Oakland	4	0.8
Foothill Boulevard	1st Avenue	73rd Avenue	Oakland	2,3	5.3
Fruitvale Avenue	Tilden Way	MacArthur Boulevard	Oakland	5	2.4
Harrison Street-Oakland Avenue	MacArthur Boulevard	20th Street	Oakland	4	1.4
High Street	I-580	MacArthur Boulevard	Oakland	7	0.1
International Boulevard	1st Avenue	42nd Avenue	Oakland	1,2,3	2.9
MacArthur Boulevard	San Pablo Avenue	Estudillo Avenue	Oakland, Emeryville, San Leandro	4,5,6	13.8
Market Street	55th Street	Stanford Avenue	Oakland	5	0.4
Martin Luther King Jr. Way	San Pablo Avenue	47th Street	Oakland	5	1.8
Park Boulevard	E. 18th Street	SR-13	Oakland	5	3.7
San Leandro Street	Fruitvale Avenue	Oakland/ San Leandro border	Oakland	5,6	4.3
San Pablo Avenue	I-580	16th Street	Oakland	5	1.1
Seminary Avenue	MacArthur Boulevard	I-580	Oakland	5	0.7
5th Street	Adeline Street	Oak Street	Oakland	4	1.3
6th Street	Adeline Street	Oak Street	Oakland	4	1.3
7th Street-E. 8th Street	I-880	14th Avenue	Oakland	5,6	3.5
8th Street	Harrison Street	Broadway	Oakland	5	0.2

Route	From	To	Jurisdiction	Criteria	Distance (miles)
E. 12th Street	Lake Merritt Boulevard	High Street	Oakland	4,5,6	4.1
14th Street- Lake Merritt Boulevard	Bush Street	12th Street	Oakland	5	1.1
E. 15th Street	1st Avenue	14th Avenue	Oakland	2,3	1.0
E. 18th Street	Lakeshore Avenue	Park Boulevard	Oakland	5	0.2
20th Street	San Pablo Avenue	Harrison Street	Oakland	5	0.5
52nd Street	Telegraph Avenue	Shattuck Avenue	Oakland	4	0.1
55th Street	Market Street	Shattuck Avenue	Oakland	5	0.5
14th Avenue	E. 8th Street	Foothill Boulevard	Oakland	5	0.3
23rd Avenue	E. 12th Street	23rd Ave NB/ SB split	Oakland	4	0.3
29th Avenue	Ford Street	International/ E. 14th Street	Oakland	4,5	0.5
42nd Avenue-Courtland	International Boulevard	High Street	Oakland	4	0.4
73rd Avenue	International Boulevard	I-580	Oakland	1,2,7	1.9
98th Avenue	I-580	Airport Access Road	Oakland	4,6	3.2
Airport Access Road	Hegenberger Road	Doolittle Drive	Oakland	4	0.3
High Street	Otis Drive	I-580	Alameda, Oakland	1,2	3.5
Broadway	Encinal Avenue	Tilden Way	Alameda	5	0.6
Constitution Way-8th Street	Webster Street	Central Avenue	Alameda	4	0.9
Fernside Boulevard	High Street	Otis- Doolittle Drive	Alameda	4	1.1
Otis Drive	Park Street	Broadway	Alameda	7	0.2
Park Street	Otis Drive	Encinal Avenue	Alameda	5	0.4
Santa Clara Avenue	Webster Street	Broadway	Alameda	5	2.3
Tilden Way	Fruitvale Avenue	Park Street	Alameda	5	0.8

Table 2.2.2—Alameda County and Cities of Hayward and Union City

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Crow Canyon Road	I-580	County Line	Alameda County	1,2	7.0
Castro Valley Boulevard-Mattox	Mission Boulevard	Crow Canyon Road	Alameda County	7	2.7
Lewelling Boulevard	Wicks Boulevard	Mission Boulevard	Alameda County, San Leandro	4	2.9
Redwood Road	I-580	Castro Valley Boulevard	Alameda County	4	0.4
Winton Avenue-D Street	Clawiter Road	Foothill Boulevard	Hayward	1,2,4	2.4
A Street	Foothill Boulevard	I-580	Hayward, Alameda County	1,2	1.2
B Street	Mission Boulevard	Foothill Boulevard	Hayward	5	0.2
C Street	Mission Boulevard	Foothill Boulevard	Hayward	5	0.2
Carlos Bee Boulevard-Hayward Boulevard	Campus Drive	Mission Boulevard	Hayward	4	1.0
Clawiter Road	Winton Avenue	SR-92	Hayward	7	1.7
Grove Way	A Street/ Redwood Road	I-580	Hayward, Alameda County	1,2	1.0
Hesperian Boulevard-Union City Boulevard	Tennyson Road	Alvarado Boulevard	Hayward, Union City	1,2	2.9
Industrial Parkway Southwest	Whipple Road	Industrial Parkway West	Hayward	4	1.0
Industrial Boulevard-Parkway West	Clawiter Road	Mission Boulevard	Hayward	4,5	5.2
Tennyson Road	Industrial Boulevard	Hesperian Boulevard	Hayward	4	0.6
Whipple Road	Union City Boulevard	Mission Boulevard	Hayward, Union City	4	3.4
Estudillo Avenue	E. 14th Street	MacArthur Boulevard	San Leandro	4	1.0
Marina Boulevard	Doolittle Drive	Washington Avenue	San Leandro	4	1.2
San Leandro Boulevard	E. 14th Street	San Leandro/ Oakland border	San Leandro	6	2.2

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Washington Avenue	Juana Avenue	Lewelling Boulevard	San Leandro	4	2.9
Wicks Boulevard-Merced Street	Marina Boulevard	Lewelling Boulevard	San Leandro	7	2.2

Table 2.2.3—Cities of Fremont, Newark, and Union City

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Alvarado Boulevard	Union City Boulevard	I-880	Union City	1,2	2.2
Fremont Boulevard	I-880 @ Alvarado Boulevard/ Fremont Boulevard	Santa Clara County line	Fremont	1,2,7	11.8
Auto Mall Parkway	Cherry Street	I-680	Fremont	1,2,4,5	2.4
Cherry-Boyce-Cushing	Thornton Avenue	I-880	Fremont	7	5.7
Dyer Street	Whipple Road	Alvarado Boulevard	Union City	4,5	1.2
Alvarado-Niles/Smith/ Niles Boulevard	Union City Boulevard	Mission Boulevard	Fremont, Union City	4,5	6.4
Grimmer Boulevard	Paseo Padre Parkway	Mission Boulevard	Fremont	5	5.1
Mission Boulevard	I-680	I-680	Fremont	7	3.0
Osgood Road- Warm Springs Boulevard	Fremont Boulevard/ Washington Boulevard	Santa Clara County line	Fremont	4,5	5.5
Paseo Padre Parkway	Peralta Boulevard	Grimmer Boulevard	Fremont	7	2.3
Paseo Padre Parkway	SR-84	Ardenwood Boulevard	Fremont	4	1.5
Stevenson Boulevard	Cherry Street	Mission Boulevard	Fremont	6	4.0
Union City Boulevard- Ardenwood- Newark Boulevard	Hesperian Boulevard	Central Avenue	Union City, Fremont, Newark	4	6.0

Route	From	To	Jurisdiction	Criteria	Distance (miles)
Walnut Avenue	Fremont Boulevard	Mission Boulevard	Fremont	5	1.8
Warren Avenue	Warm Springs Boulevard	Fremont Boulevard	Fremont	4	1.0
Washington Boulevard	Fremont Boulevard	Mission Boulevard	Fremont	4	2.2
Central Avenue	I-880	Cherry Street	Newark	7	0.8
Mowry Avenue	Cherry Street	I-880	Newark	6	0.8
Thornton Avenue	SR-84	I-880	Newark	4,6	3.7

Table 2.2.4—Alameda County and Cities of Dublin, Livermore, and Pleasanton

Route	From	To	Jurisdiction	Criteria	Distance (miles)
North Front Road-Altamont Pass Road-Grant Line	Vasco Road	County line	Alameda County, Livermore	7	11.1
Tesla Road	Livermore Avenue	County line	Alameda County	7	11.9
Patterson Pass Road	Vasco Road	County line	Alameda County, Livermore	7	10.1
Dublin Boulevard	San Ramon Road	Fallon Road	Dublin	1,2,4,5	6.4
Dougherty Road	I-580	County line	Dublin	1,2	1.9
Fallon Road	I-580	Tassajara Road	Dublin	4	2.8
San Ramon Road	I-580	County line	Dublin	1,2	1.7
Tassajara Road	I-580	County line	Dublin	1,2	2.8
Village Parkway	Dublin Boulevard	County line	Dublin	4	1.5
E. Stanley Boulevard-Railroad Avenue-1st Street	Isabel Avenue	Inman Street (connecting I-580)	Livermore	1,2,3	4.2

Route	From	To	Jurisdiction	Criteria	Distance (miles)
East Avenue	Livermore Avenue	Vasco Road	Livermore	5	2.3
East Avenue	Livermore Avenue	Vasco Road	Livermore	5	2.3
First Street	Stanley Boulevard	Railroad Avenue	Livermore	5	2.7
Isabel Avenue	Portola Avenue	Airway Boulevard	Livermore	4	0.9
Livermore Avenue	I-580	Tesla Road	Livermore	4,5	5.1
North Canyons Parkway-Portola	Airway Boulevard	1st Street	Livermore	4,5	4.4
Vallecitos Road	SR-84	1st Street	Livermore	4	3.3
Vasco Road	County line	Tesla Road	Livermore	1,2,4	8.8
Bernal Avenue	I-680	Sunol Boulevard/ First Street	Pleasanton	4	1.4
El Charro Road	I-580	Stoneridge Drive	Pleasanton	7	0.3
Foothill Road	Stoneridge Drive	I-580	Pleasanton	4	0.7
Stoneridge Drive	I-680	Santa Rita Road	Pleasanton	1,2	2.5
Main Street-Santa Rita Road	Bernal Avenue	I-580	Pleasanton	1,2,4,5	3.5
Neal Street	Santa Rita Road	Sunol Boulevard	Pleasanton	5	0.1
Owens Drive	Willow Road	W. Los Positas Boulevard	Pleasanton	5	1.3
Stoneridge Drive-Jack London Boulevard	Foothill Road	Isabel Avenue	Pleasanton	7	4.9
W. Los Positas Boulevard	Owens Drive	Santa Rita Road	Pleasanton	5	1.3
Sunol Boulevard-1st Street-Stanley Boulevard	I-680	Isabel Avenue	Alameda County, Pleasanton	1,2	5.6

CMP and MTS Roadway Networks and MTS Transit Corridors

The entire CMP-designated system (Tiers 1 and 2) is illustrated in Figure 1, and detailed maps for each area within the county are shown in Figures 2-5. The Metropolitan Transportation System designated by MTC appears in Figures 1-5. The MTS transit corridors appear in Figures 6-7. Figure 8 represents the 2017 CMP transit monitoring network. Alameda CTC monitors transit performance for the two largest operators on CMP roadways: LAVTA and AC Transit. Union City offers more limited service, and other operators like the Altamont Corridor Express, Capitol Corridor, San Francisco Bay Area Rapid Transit, and the San Francisco Bay Area Water Emergency Transit Authority provide service, but not on CMP or MTS roadway networks, performance for these services are monitored systemwide

Next Steps

During the 2019 CMP update, the following next steps were identified for the update of the Designated CMP Roadway Network in the 2021 update, which will be an overhaul of CMP to align with the current industry practice and polices:

- Review and update the CMP network criteria in the 2021 CMP update as necessary.
- Reevaluate the value and effectiveness using the MTS network and MTS transit corridors for various CMP elements. . MTC's updated CTP guidance no longer includes references to the MTS and Alameda CTC primarily uses the much larger and more current CMP network.

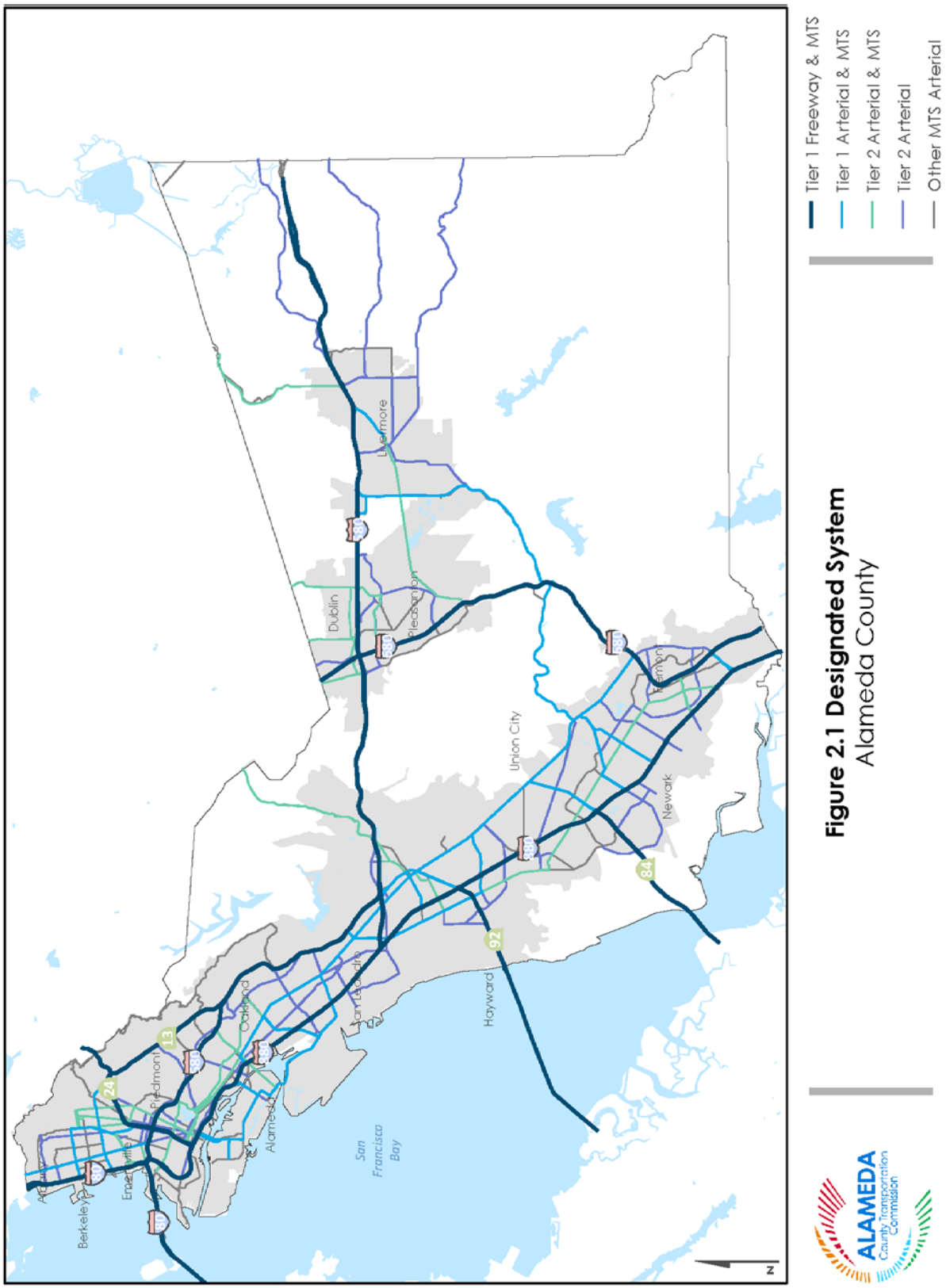

Figure 2.1 Designated System
Alameda County

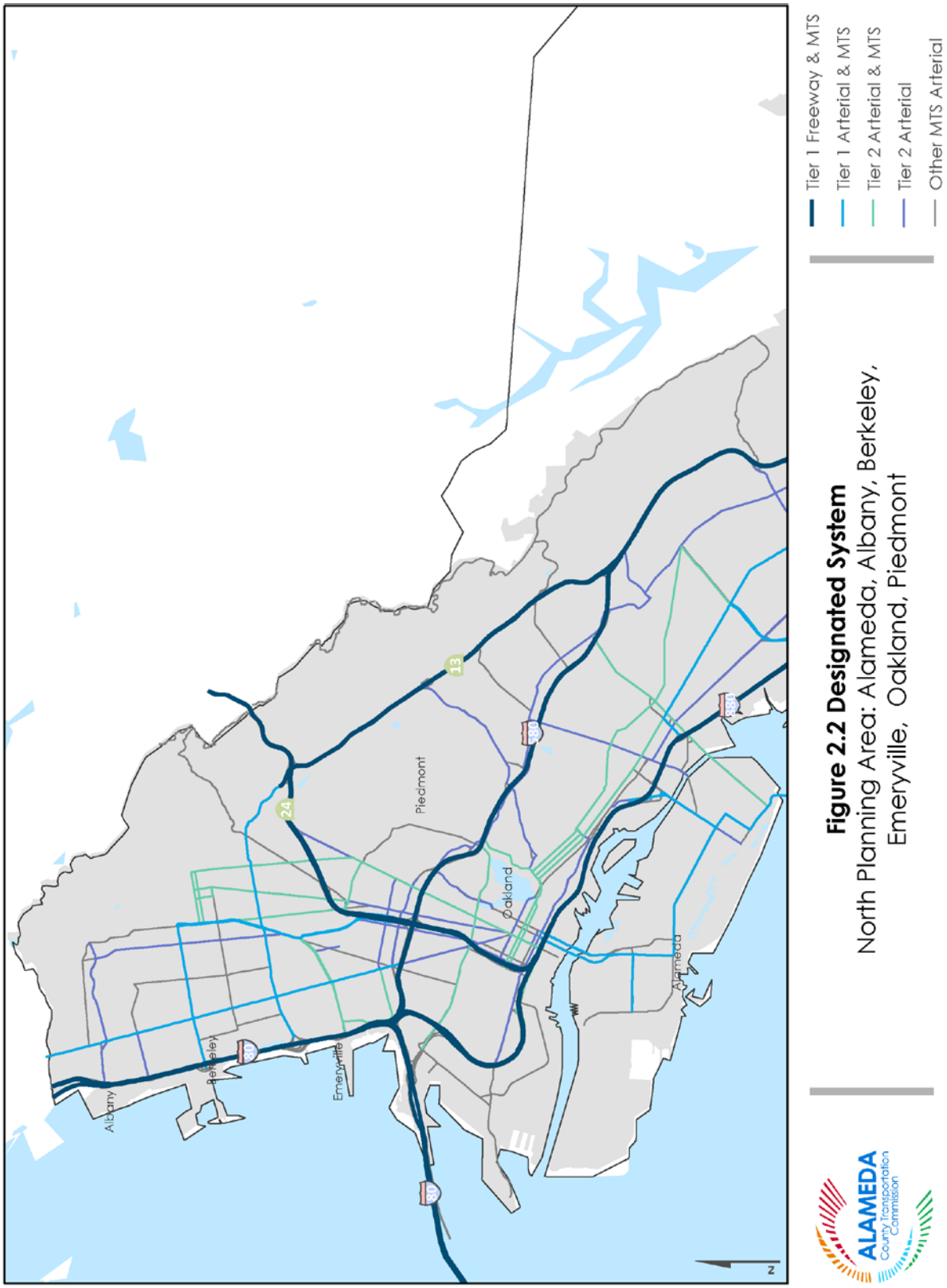

Figure 2.2 Designated System
North Planning Area: Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont

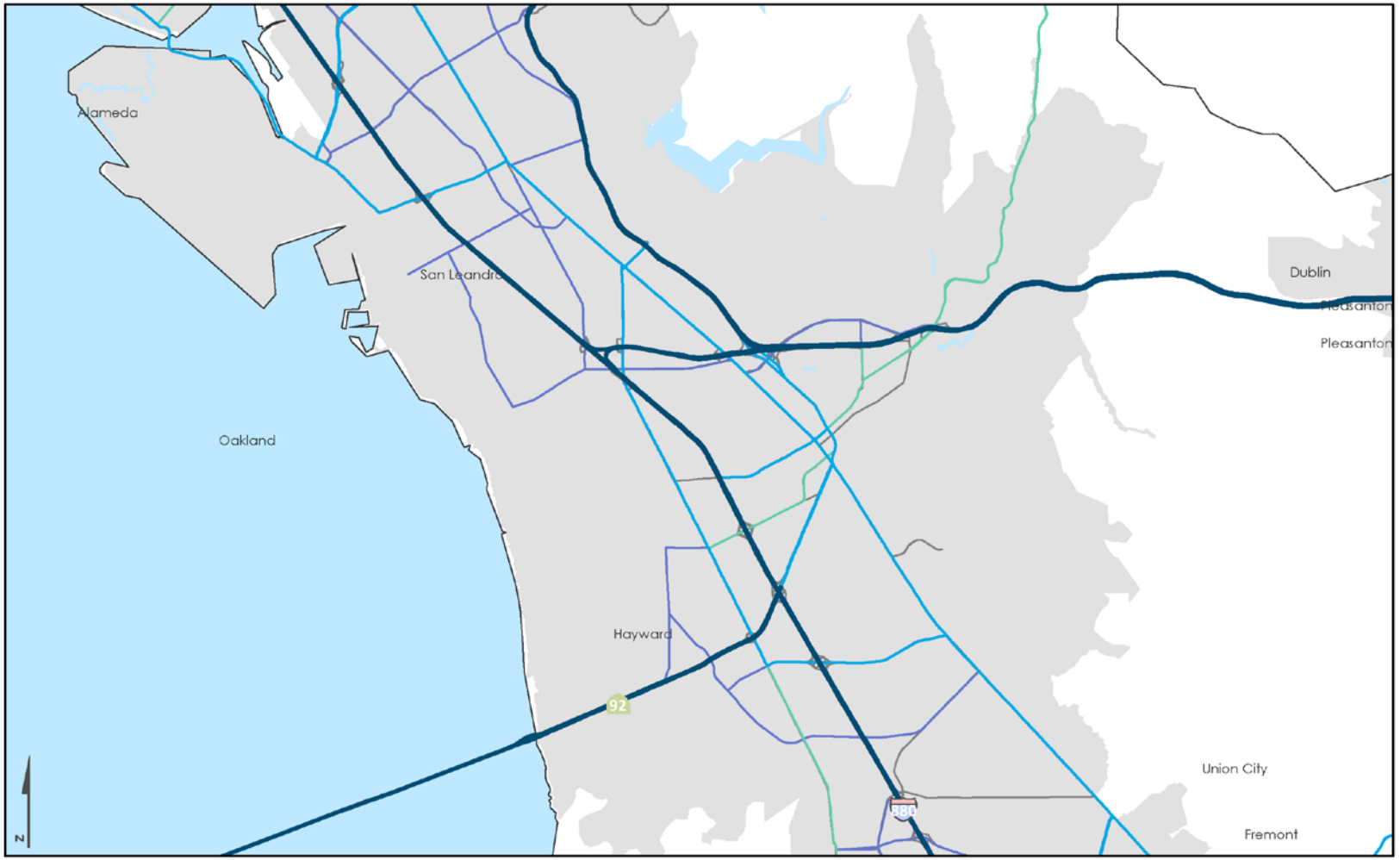

Figure 2.3 Designated System
Central Planning Area: Ashland, Castro Valley, Cherryland, Hayward, San Leandro, San Lorenzo

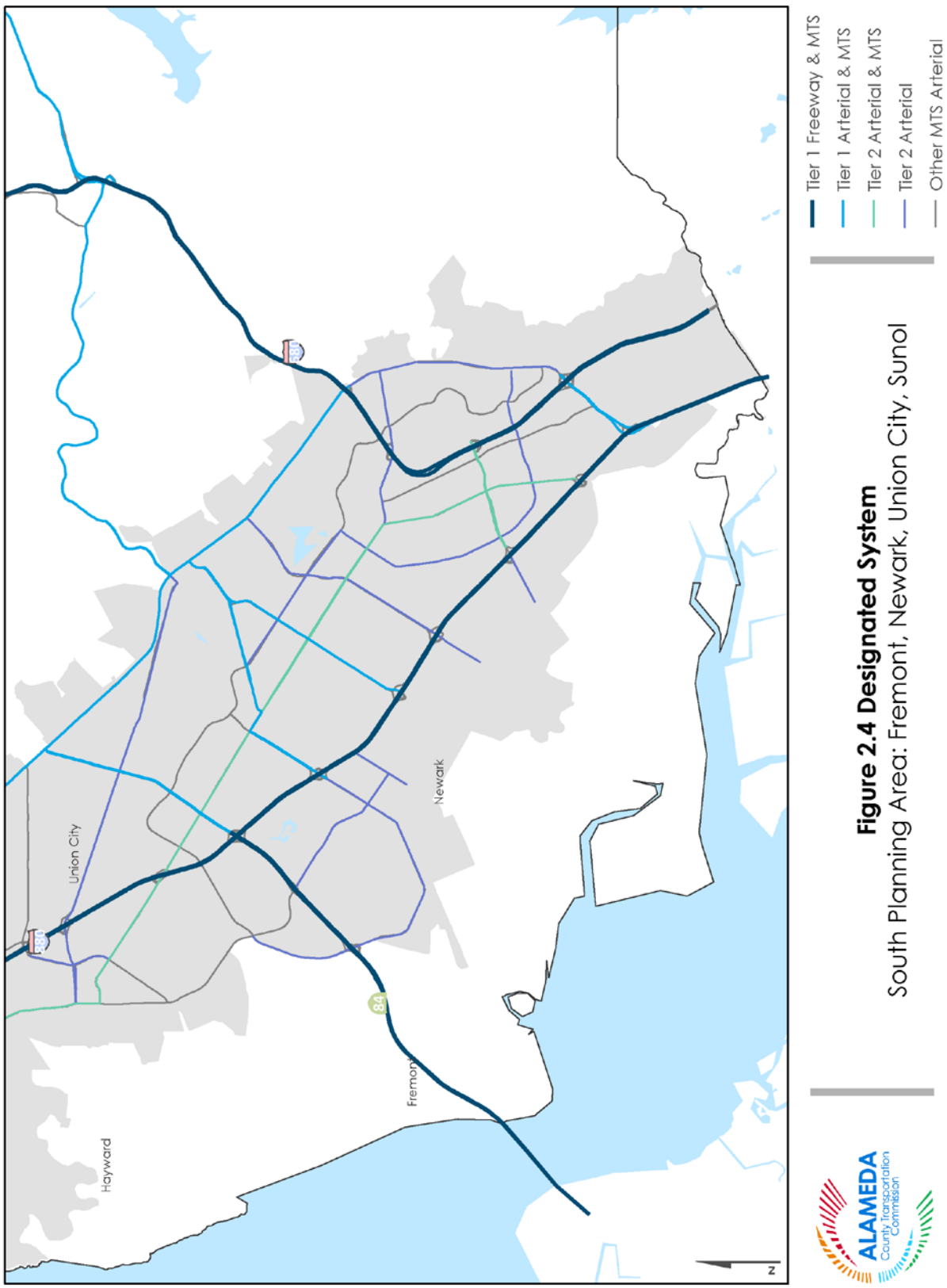

Figure 2.4 Designated System
South Planning Area: Fremont, Newark, Union City, Sunol

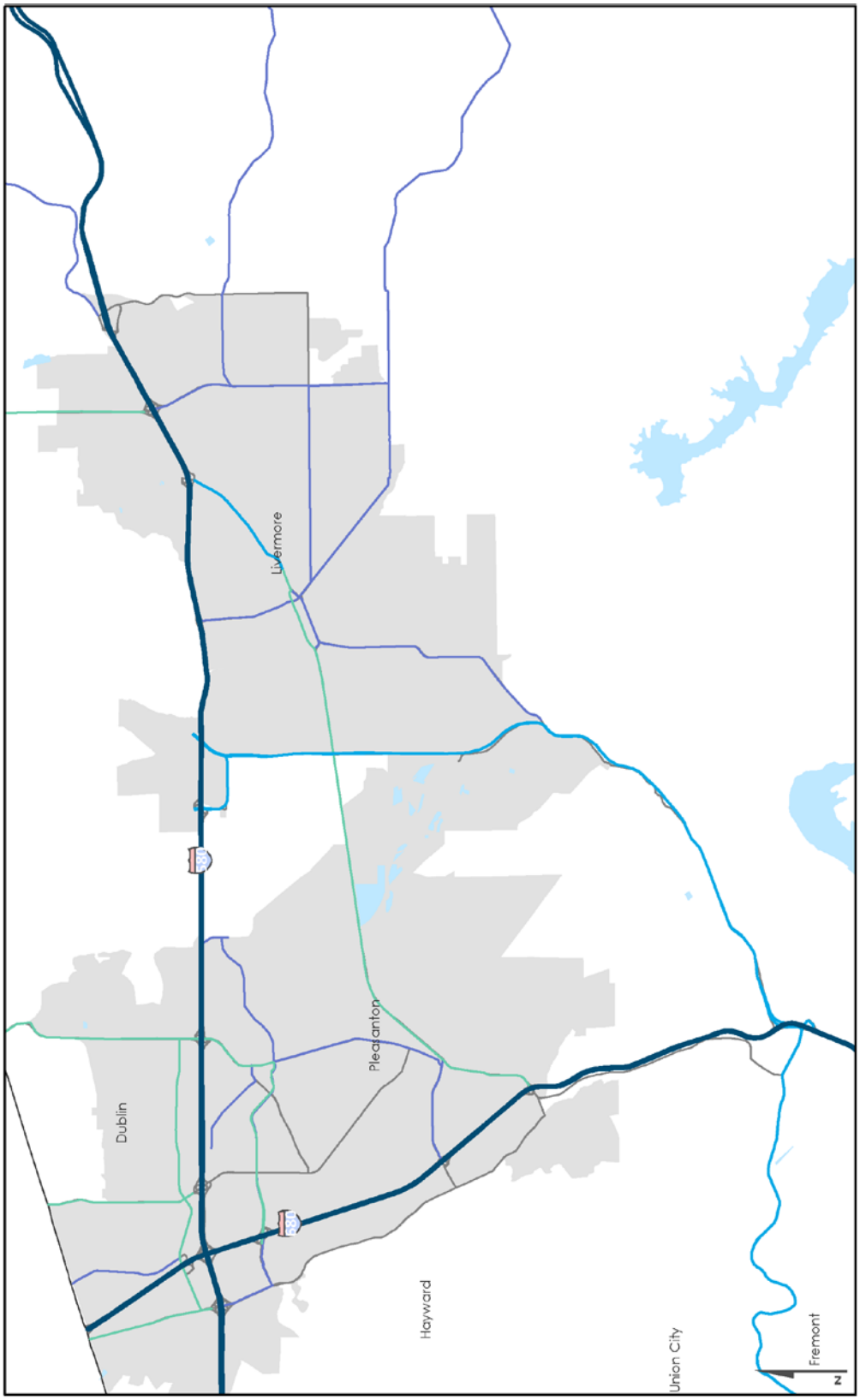

Figure 2.5 Designated System
East Planning Area: Dublin, Livermore, Pleasanton, Sunol

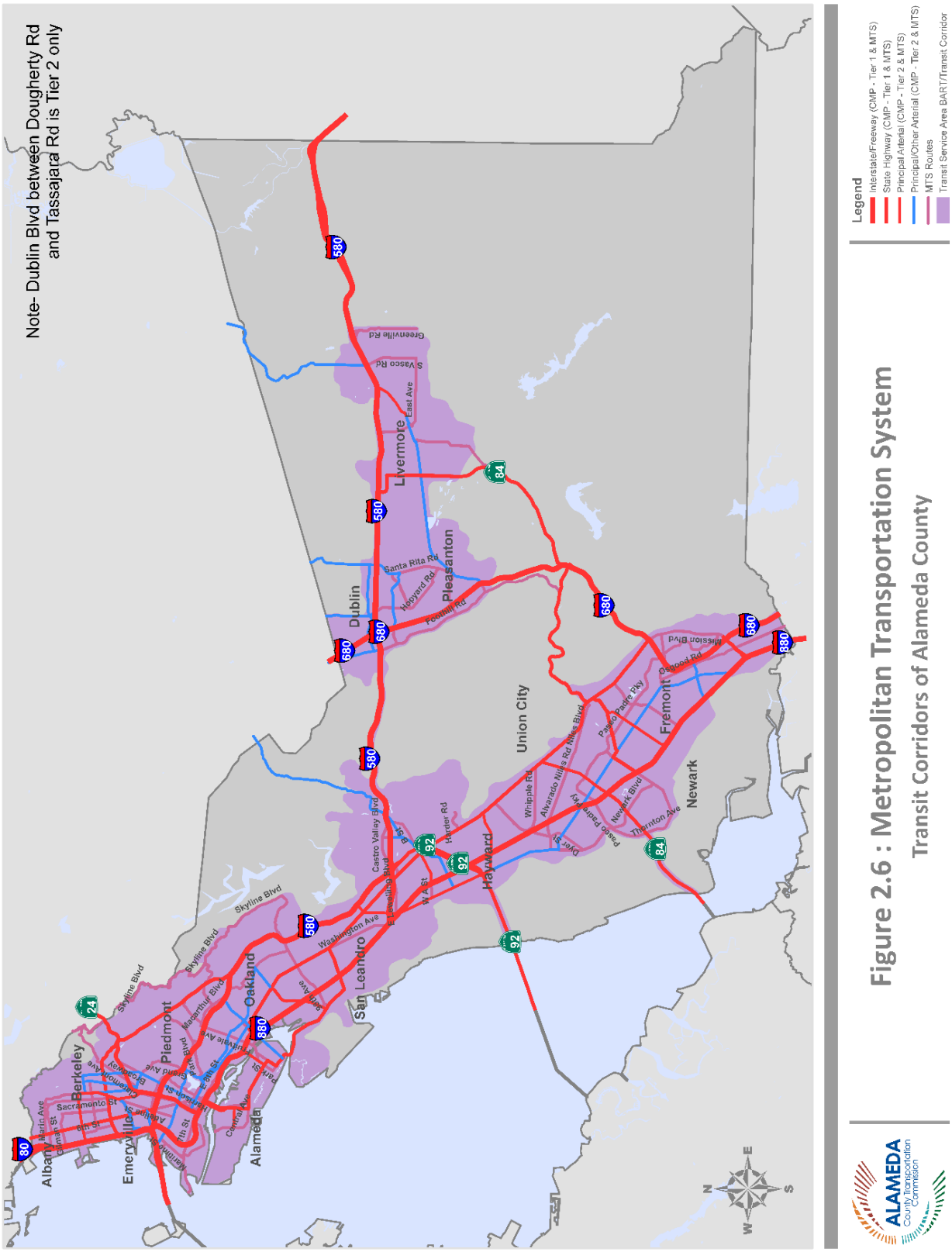

Figure 2.6 : Metropolitan Transportation System
Transit Corridors of Alameda County

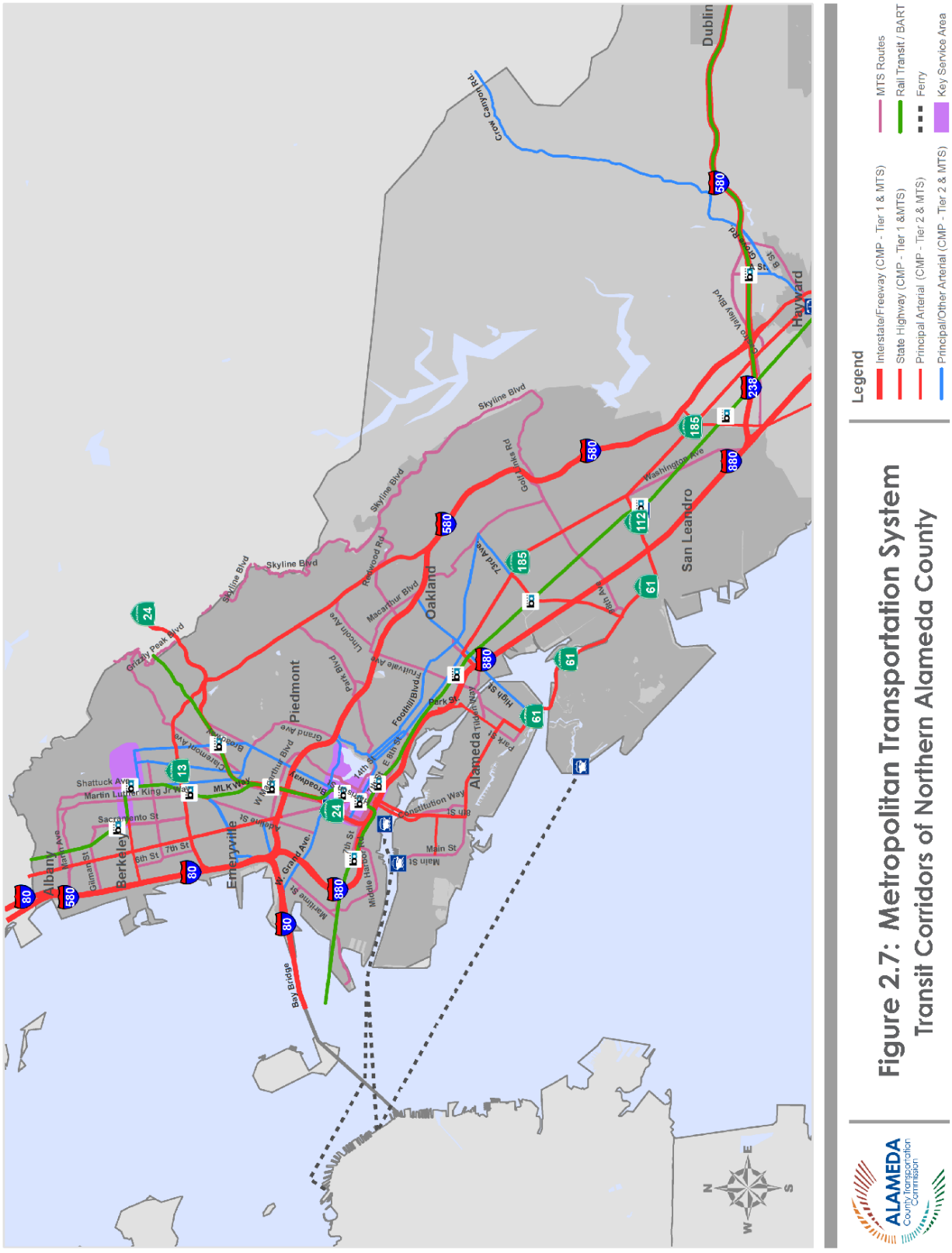

Figure 2.7: Metropolitan Transportation System
Transit Corridors of Northern Alameda County

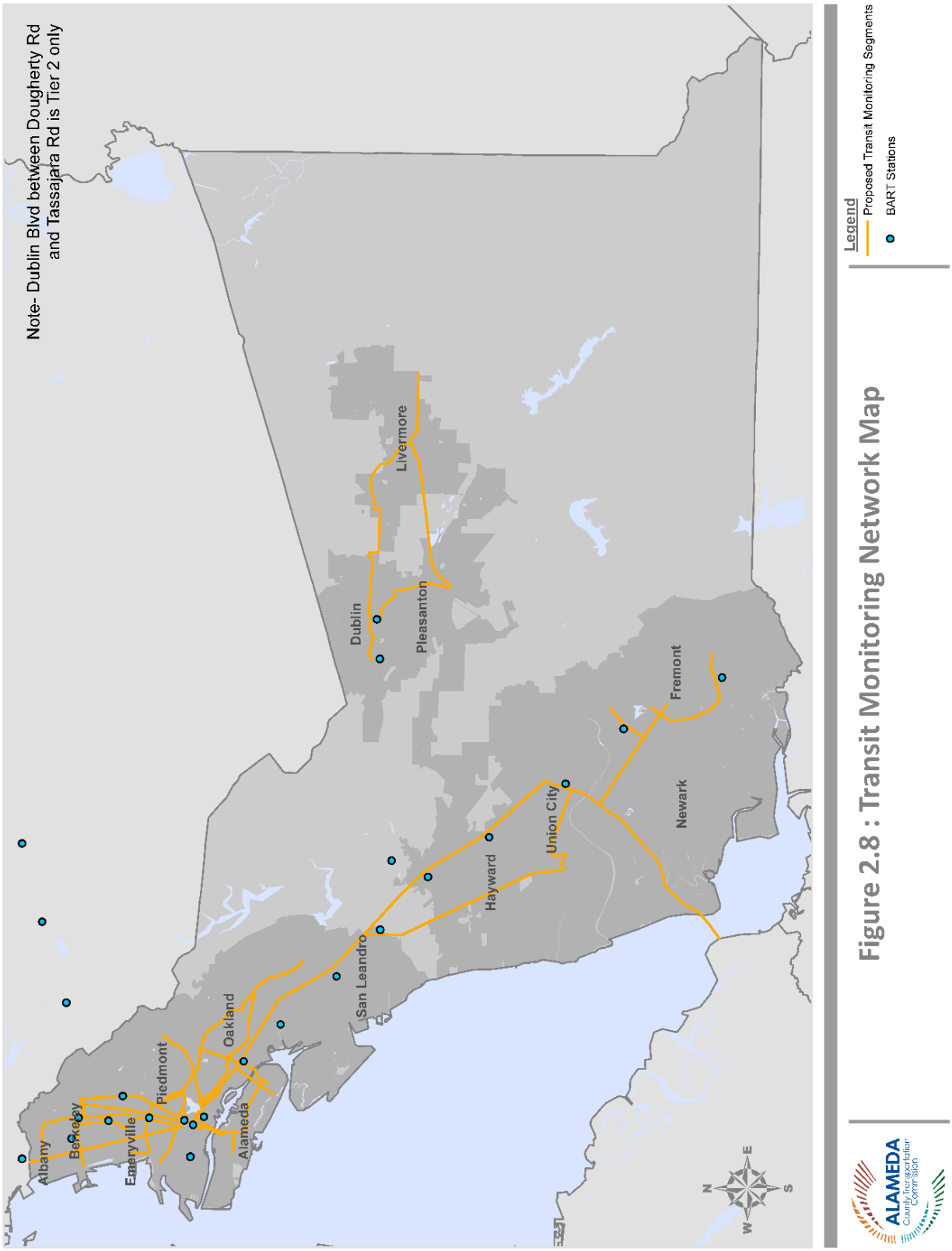

Figure 2.8 : Transit Monitoring Network Map

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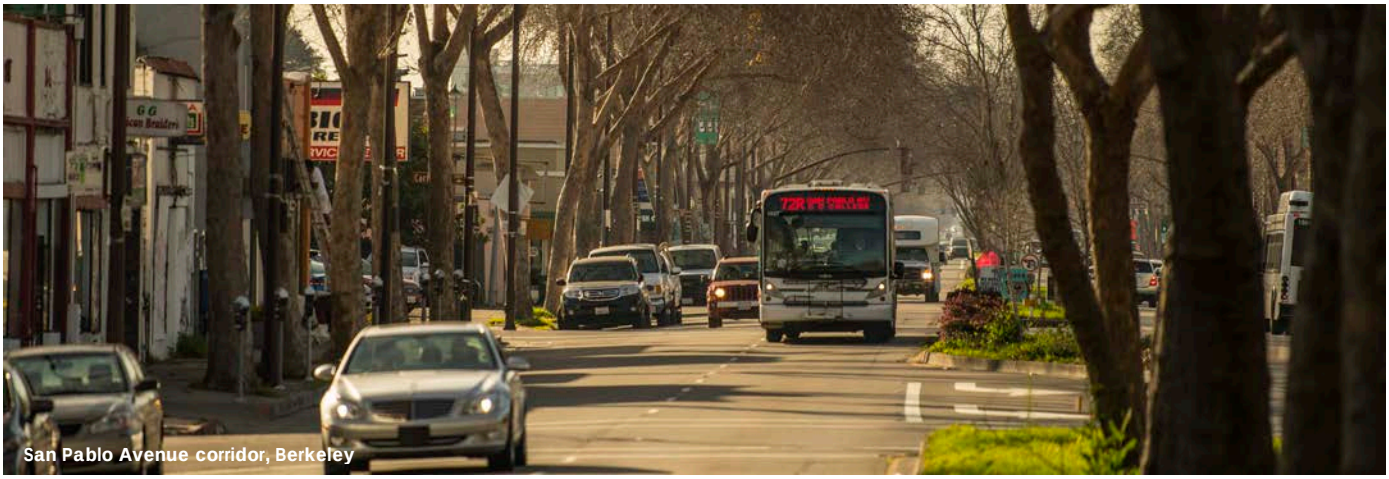
Level of Service and Transit Performance Standards

3



San Pablo Avenue corridor, Berkeley

State law requires that level of service (LOS) standards be established to monitor the CMP roadway network's LOS as part of the CMP process[10]. The legislation leaves the choice of LOS measurement methodology to the CMAs, but mandates that the LOS be measured by the most recent version of the Transportation Research Board's Highway Capacity Manual (HCM) or a uniform methodology adopted by the CMA, Alameda CTC for Alameda County, that is consistent with the HCM (see Appendix B for Alameda CTC's assessment of HCM2010).

LOS definitions generally describe traffic conditions in terms of speed and travel time, volume and capacity, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. LOS is represented by letter designations, ranging from A to F, with LOS A representing the fastest operating conditions and LOS F representing the slowest (see Appendix E for graphic representation of LOS).

The purpose of setting LOS standards for the CMP network is to provide a quantitative tool to analyze the effects of land use changes on the transportation network's performance (i.e., congestion) or to identify hot spots. If the actual network performance of a roadway segment falls below the standard (i.e., congestion worsens below LOS E), actions must be taken to improve the LOS.

Alameda CTC contracts with a consultant to perform the necessary LOS monitoring for the CMP network. Initially, the CMP network was monitored annually, but in 1998 a policy was adopted to perform the LOS monitoring every two years, which has proven to be the most cost-effective approach. The next monitoring study will be performed in spring 2020.

In addition to monitoring auto LOS on the CMP roadways, Alameda CTC has expanded its biennial performance monitoring to include multimodal performance standards. This is an outcome of the agency's development of comprehensive countywide modal plans, including a Countywide Goods Movement Plan, a Countywide Multimodal Arterial Corridor Plan, and a Countywide Transit Plan to identify and address the multimodal transportation needs of the county as a whole. As a first step, Alameda CTC began transit performance monitoring on the network described in Chapter 2 in the 2018 monitoring cycle.

[10] California Government Code Section 65089(b)(1)(A).

Standards and Approach for LOS Monitoring

LOS is an indication of traffic growth trends using vehicular volumes, capacity, and measurement of average speed and delay. The goal is to develop a consistent approach for monitoring LOS that is easy to use, non-duplicative, and compatible with local government data and travel-demand models. Table 3.1 describes the approach for monitoring LOS in Alameda County and defines the facility classifications.

Table 3.1—Approach to LOS Monitoring

Element	Approach
Level of Service	As defined in the California Government Code Section 65089.3, the LOS standard is E, except where F was the LOS when originally measured, in which case the standard is F. The methods employed by Alameda CTC constitute a uniform methodology adopted by the Commission that is consistent with the HCM1985 that includes speed-based LOS methodology for roadway segments. Methods described in HCM Chapter 8, "Two-Lane Highways" and Chapter 11, "Urban and Suburban Arterials" were the basis for establishing the LOS on the CMP network. LOS is assessed based on the average speed observed along a roadway segment (link speeds) or total volumes approaching an intersection (link volumes). These methods are not designed to replace the more detailed procedures that local agencies are likely to use for non-CMP purposes (such as local impact studies). Such procedures typically focus on an intersection's ability to handle individual turning movements rather than average speed on a roadway segment. Pending the final rulemaking of the Office of Planning and Research's CEQA Guidelines on Evaluating Transportation Impacts in CEQA to implement SB 743, local impact studies would shift from measuring intersection or segment-level LOS impacts to vehicle miles traveled impacts.
Facility Classifications	The HCM provides methods for determining LOS on several types of facilities. These facilities are grouped into "interrupted-flow" and "uninterrupted-flow" facilities. Interrupted-flow facilities include city streets and surface highways (for example, State Route 123/San Pablo Avenue) that are part of the state highway system. Freeways are uninterrupted-flow facilities. For the purposes of LOS monitoring, the CMP network can be classified into three functional types of facilities: 1) freeways; 2) two-lane roadways; and 3) urban/suburban arterials. In Alameda County, HCM1985 classification is used for the Tier 1 roadways for consistency in methodology and for the ability to track performance trends over time. HCM2000 is followed for Tier 2 roads added since 2011.

Element	Approach
1) Freeways	Freeways are uninterrupted-flow facilities, since traffic never stops (except during the most congested periods or when incidents occur). The 1991 Alameda County CMP, in coordination with local jurisdictions, defined appropriate segments and performed the necessary "floating car" runs on the freeways to obtain travel speed data (refer to "Data Collection and Requirements" in this chapter for information on this data collection method). This allowed the establishment of a baseline LOS for the roadway network, including identification of segments operating at LOS F.
2) Two-Lane Roadways	Two-lane roadways are uninterrupted-flow facilities, also referred to as principal arterials. The criteria adopted by Alameda CTC for including principal arterials in the CMP network specify a minimum of four lanes; therefore, two-lane roadways are not included as principal arterials. However, since all state highways must be in the system, two-lane state highways located in the county are also included in the CMP network. These two-lane roads constitute a fairly small portion of the CMP network mileage. For two-lane roads without interruptions (signals or stop signs), the methodology in HCM Chapter 8 is used, based on average travel speed.
3) Urban and Suburban Arterials	Urban and suburban arterials are multilane streets that have traffic signals spaced no more than two miles apart on average. Urban and suburban arterials are characterized by platoon flows. Operational quality is controlled primarily by the efficiency of signal coordination and is affected by how individual signalized intersections operate along the arterial. LOS is primarily a function of travel speed along segments and is calculated from field data. Because the CMP legislation emphasizes systems-level planning, HCM Chapter 11 is used to estimate arterial LOS. Advantages include the need for relatively little input data, simple applied calculations, and the results of explicitly determined LOS (A, B, C, etc.).
Monitoring	Alameda CTC monitors LOS and produces comprehensive a biennial report. Alameda CTC uses two data collection methods for LOS monitoring: 1) commercial speed data based on aggregated traffic data from GPS-enabled vehicles and mobile devices, traditional road sensors, and other sources; and 2) the floating car technique of recording travel times between checkpoints based on actual travel time during the peak period. Refer to "Data Collection and Requirements" in this chapter for details on the two data collection methods.
Interregional Trips	For the purposes of conformity with current legislation, interregional travel is defined as "any trip that originates from outside" Alameda County. A trip means a one-direction vehicle movement. The origin of any trip is the starting point of that trip. In accordance with the Metropolitan Transportation Commission (MTC) guidelines, trips with no trip end in Alameda County (through trips) are not subtracted for monitoring reports.

Highway Capacity Manual (HCM) and LOS Standards

The Congestion Management Program legislation requires that the LOS monitoring on CMP roadways be measured by the most recent version of the HCM or by a uniform methodology adopted by the CMA, consistent with the HCM. For LOS Monitoring and Deficiency Plan purposes, Alameda CTC uses speed-based LOS methods included in the HCM1985 to

determine LOS for the CMP roadways, as shown in Table 3.2 (adopted in 1991 and updated in 2004).

To transition to using the most recent HCM for the purposes of LOS monitoring and Land Use Analysis Programs of the CMP, efforts were made in 2005 to use HCM2000 and in 2013 to use HCM2000 or HCM2010. Based on comparative analyses of the various HCMs, the following observations were made:

- **Different methodologies would hinder conformity.** For freeways, the differences between the HCM1985 and the HCM2000 and HCM2010 methodologies were significant. Specifically, the basis for determining LOS has changed from speed-based LOS in HCM1985 to density-based LOS in HCM2000 and HCM2010. This eliminates the ability to track previous LOS trends, monitoring of existing deficiency plans, and consistency in determining deficiency; hence, this affects conformity.
- **Classification changes would affect conformity.** For arterials, the roadway classifications changed after the HCM1985. Classifications were added in the HCM2000, and later classifications were eliminated in the HCM2010. Further, in the HCM2010, free-flow speed, which is the basis for estimating LOS in all HCM versions, requires additional facility-specific data that is excessive for large-scale use such as LOS monitoring on the countywide CMP network.

Using the later HCM2000 and HCM2010 versions would result in applying density-based LOS methodology for freeways and changed classifications for arterials. This would not provide substantially improved performance data and would hinder conformity and the ability to compare past performance trends. Based on this analysis for the Tier 1 network, which is subject to conformity, Alameda CTC will continue to use speed-based LOS methodology and arterial classifications in the HCM1985 to monitor freeways and arterials. For the Tier 2 network, which has been only monitored for informational purposes since 2012 and has no previous performance data available to compare, LOS was reported using both HCM1985 and HCM2000 methodologies starting in 2014. Accordingly, the 2014 LOS Monitoring Report developed different classifications for Tier 2 based on HCM1985 and HCM2000 and the reported LOS. Since the classification has already been established, the 2020 LOS monitoring cycle will continue to use the same approach.

As part of the 2013 CMP update, Alameda CTC identified LOS standards to monitor alternative modes in a comparable way to auto performance. Since HCM2010 also included LOS standards for monitoring alternative modes, such as multimodal level of service (MMLOS), Alameda CTC evaluated MMLOS for monitoring performance of transit and bicycle and pedestrian modes. It was found that using the HCM2010-based MMLOS is data and resource intensive and costly for large-scale applications such as monitoring countywide performance of the alternative modes; therefore, it is not suitable for LOS monitoring purposes. In-lieu of MMLOS, Alameda CTC began measuring transit performance in the 2018 LOS monitoring cycle. The 2017 CMP Update, described in Chapter 2, identified major transit corridors across the county for monitoring transit performance. Alameda CTC will continue to review the methodology during each CMP update to identify any improvements to the overall approach.

Table 3.2—Relationship Between Average Travel Speed and LOS

Freeways (Source: HCM1985)			
Level of Service	**Average Travel Speed (mph)**	**Volume-To-Capacity Ratio**	**Maximum Traffic Volume (vehicles/hour/lane)**
A	≥ 60	0.35	700
B	≥ 55	0.58	1000
C	≥ 49	0.75	1500
D	≥ 41	0.90	1800
E	≥ 30	1.00	2000
F	≤ 30	Variable	–

Arterials LOS (Source: HCM1985) (used for monitoring freeways and arterials)			
Arterial Class	**I**	**II**	**III**
Range of Free Flow Speed (mph)	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	40	33	27
Level of Service	**Average Travel Speed (mph)**		
A	≥ 35	≥ 30	≥ 25
B	≥ 28	≥ 24	≥ 19
C	≥ 22	≥ 18	≥ 13
D	≥ 17	≥ 14	≥ 9
E	≥ 13	≥ 10	≥ 7
F	≤ 13	≤ 10	≤ 7

Arterials LOS (Source: HCM1985 and HCM2000) (used for monitoring Tier 2 arterials)				
Urban Street Class	**I**	**II**	**III**	**IV**
Range of Free Flow Speed (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	50	40	35	30
Level of Service	**Average Travel Speed (mph)**			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

Sources: Table 12-1, Special Report 209, HCM 1985; Exhibit 15-2, HCM 2000 (U.S. Customary Units). Information in [brackets] added for clarification.

Traffic Monitoring Program

Alameda CTC conducts LOS monitoring on the Alameda County CMP network. For this purpose, the CMP route segments were determined for travel-time analysis with input from the Alameda County Technical Advisory Committee (ACTAC) and appropriate local jurisdiction departments (traffic engineering, planning department, etc.). Data collection time periods were determined based on the general congested peak periods on most of the CMP roadway network.

Definition of Roadway Segments

Alameda CTC used the following guidelines to determine the segments:

- Segments should be at least one mile and not more than five miles in length; and
- Logical segment break-points include jurisdictional boundaries, points where the basic number of travel lanes change, locations where land use changes occur (e.g., commercial areas versus residential), and points where the posted speed limit changes or where the number of adjacent driveways is significantly different.

Since the adoption of the CMP roadway segments in 1991, the intensity and location of congestion throughout the county has changed. In 2007, the CMP roadway segment lengths and criteria for designating the CMP roadway segments to develop new segments were updated to better reflect existing land use and travel patterns.

Many long segments were found to be operating at better levels of service because speeds were averaged over the length of longer segments. Splitting these segments using the approved criteria revealed congestion hot spots and more accurately identified congested segments. Because the original checkpoints were retained, all new segments nest within the pre-2007 roadway segments. This approach allows trends to be evaluated over time. During the 2009 CMP Update, SR-84 in East County was segmented into shorter segments based on the same criteria. Similarly, as part of the 2017 CMP update, two segments on A Street and Mission Boulevard in Hayward were segmented into shorter segments, to reflect the one-way traffic pattern that resulted from opening the Hayward Loop. From a field and operating perspective, the current CMP roadway segmentation criteria are still appropriate; therefore, no changes are recommended for this update.

Data Collection and Requirements

The traffic monitoring program requires information about average travel speed, which is the basis for measuring level of service on all facility types (i.e., freeways, two-lane highways, and urban/suburban arterials). For a given roadway segment, speed data must be collected and reported separately for each travel direction. Travel speed studies for this purpose are conducted using two methods for autos—commercial speed data and floating car survey:

- Commercial speed data aggregates traffic data from GPS-enabled vehicles and mobile devices, traditional road sensors, and other sources. These data are reported using discrete roadway links known as Traffic Message Channels (TMCs). For the 2018 LOS monitoring, data at one-minute intervals was accessed for the selected monitoring times across all the identified TMCs in Alameda County. Use of commercial speed data was approved by the Commission in 2013 based on a validation exercise carried out by Alameda CTC.
- Floating car surveys are used where the coverage of commercial speed data is not adequate or results are not expected to be reliable. Floating car surveys use GPS technology to determine the travel time between the start and end of each CMP segment. A test car is driven six times in each direction on each CMP segment. If congested segments (LOS F) are experienced in the afternoon, and the route is subject to conformity, then two additional runs are generally completed on the entire route. Floating car surveys are conducted for Tier 1 arterials and for 18 miles out of 89 miles of

Tier 2 arterials. In the 2016 LOS Monitoring Report, two new metrics were added—reliability and duration of delay, both of which were calculated for informational purposes.

The data collection process also identifies the days and time periods to perform CMP network monitoring. For the most recent LOS monitoring cycle, monitoring days were reviewed and identified separately for commercial speed data and floating car surveys:

- Commercial speed data collection and floating car surveys are generally conducted in the months of March, April, and May when schools are in session. When additional floating car surveys are required, some data collection efforts can be extended into the first week of June, but need to be complete before the schools close for the summer.
- Data are collected on a Tuesday, Wednesday, and/or Thursday, because these days are most indicative of average weekday conditions. Additional weekend monitoring of freeways (Tier 1) was done for informational purposes, between 1:00 p.m. and 3:00 p.m.
- Monitoring time periods are 4:00 p.m. to 6:00 p.m. during the p.m. peak hours and 7:00 a.m. to 9:00 a.m. during the a.m. peak hours. Generally, p.m. peak-period monitoring is used for conformity purposes, with the exception of the Tier 2 network, where both morning and afternoon peak periods are monitored for informational purposes only. Monitoring during the a.m. peak period for all CMP roadways is for informational purposes only.
- Test car runs on a particular segment must span a range of days and time of day. This means that test car runs should not be bunched on the same day of the week or taken on separate days at the same time.
- Data collection during holidays, special events, when school is not in session, or when roadway construction is under way must be avoided.
- Consistent monitoring periods must be observed for each roadway segment. For example, a comparison between April 2010 and April 2011 is likely to be more valid than a comparison between January 2010 and August 2011.
- If special generators are located within a few miles of the monitoring location, it must be determined whether unusual or unwanted activity levels are occurring at the special generators.
- Incidents are generally expected to impact traffic conditions, and therefore data associated with incidents is excluded. For floating car surveys, where the driver observes an incident, the floating car survey run is repeated. For commercial speed data, freeway incident data sets from PeMS are reviewed, and the speed data records for the corresponding time period are removed across all the relevant CMP segments.

The auto and transit monitoring methodologies for the 2020 LOS Monitoring Report will follow a similar approach to the 2018 LOS Monitoring Report and data will be collected in spring of 2020.

Grandfathered LOS F Roadway Segments

CMP legislation exempts congested CMP roadway segments that did not meet the minimum LOS standards (LOS E) when the CMP network was formed (in 1991 and 1992) from deficiency identification and preparing a deficiency plan. These grandfathered segments were identified based on the LOS monitoring performed in 1991 for the CMP roadway segments and in 1992 for the CMP freeway-to-freeway connectors during the p.m. peak period, which is used for conformity. According to the study results, a total of 15 freeway segments (excluding freeway-to-freeway connectors) and 15 arterial segments were operating at LOS F in 1991 and five freeway-to-freeway connectors were operating at LOS F in 1992. Tables 3.3, 3.4, 3.5, and Figure 3.1 show the grandfathered CMP segments including the freeway-to-freeway connectors.

Although these segments are grandfathered by statute, they are not exempt from analysis and mitigation for the purpose of satisfying the Land Use Analysis Program (Chapter 6), the California Environmental Quality Act (CEQA), and the federal National Environmental Protection Act. The CMP focuses on existing congestion; therefore, Alameda CTC will considers strategies and/or improvements to address grandfathered segments in corridor studies, the Countywide Transportation Plan, and through the CMP Capital Improvement Program.

Table 3.3—PM LOS F Freeways for Alameda County CMP-Designated Roadway Network

	Roadway		Limits	Jurisdiction	Average Speed (mph)
1	I-80	EB	From Toll Plaza to I-580 Merge	Oakland	21.2
2	I-80	EB	From I-80/I-580 (Merge) to Powell Street	Emeryville	10.9
3	I-80	EB	From Powell Street to Ashby Avenue	Emeryville/Berkeley	12.8
4	I-80	EB	From Ashby Avenue to University Avenue	Berkeley	21.2
5	I-80	WB	From University Avenue to Ashby Avenue	Berkeley	26.9
6	I-80	WB	From Ashby Avenue to Powell Street	Emeryville	19.1
7	I-80	WB	From Toll Plaza to San Francisco County	Oakland	22.6
8	I-580	EB	From Eden Canyon Road to San Ramon Road/ Foothill Road	Unincorporated/ Pleasanton	23.9
9	I-580	EB	From San Ramon Road/Foothill Road to I-680	Pleasanton	14.9
10	I-580	EB	From I-680 to Hopyard Road	Pleasanton	14.8
11	I-580	EB	From Hopyard Road to Santa Rita Road	Pleasanton	26.7
12	I-580	EB	From 1st Street to Greenville Road	Livermore	22.8
13	I-580	EB	From Greenville Road to North Flynn Road	Unincorporated	21.0
14	I-580	EB	From I-80 to I-980	Oakland	19.5
15	I-580	EB	From I-980 to Harrison Street	Oakland	15.7
16	I-580	EB	From Harrison Street to Lakeshore Avenue	Oakland	20.8
17	I-580	WB	From SR-24 On-Ramp to I-80/I-580 Split	Oakland	24.0
18	I-680	NB	From Scott Creek Road to SR-262/Mission Boulevard	Fremont	23.3
19	I-680	NB	From SR-262/Mission Boulevard to Durham Road	Fremont	9.0
20	I-680	NB	From Durham Road to Washington Boulevard	Fremont	12.2

	Roadway		Limits	Jurisdiction	Average Speed (mph)
21	I-680	NB	From Washington Boulevard to SR-238/ Mission Boulevard	Fremont	20.8
22	I-680	NB	From SR-238/Mission to Vargas Road	Fremont	22.2
23	I-680	NB	From Vargas Road to Andrade Road	Unincorporated	20.2
24	I-880	NB	From Dixon Landing to SR-262/Mission Boulevard	Fremont	25.1
25	I-880	NB	From Stevenson Boulevard to Decoto Road	Fremont	27.0
26	I-880	NB	From Decoto Road to Alvarado Boulevard	Fremont	18.7
27	I-880	NB	From Alvarado Boulevard to Alvarado-Niles Boulevard	Fremont/Union City	22.4
28	I-880	NB	From Alvarado-Niles Boulevard to Tennyson Road	Union City/Hayward	18.7
29	I-880	NB	From Tennyson Road to SR-92	Hayward	25.7
30	I-880	NB	From I-880/I-80 (Split) to I-880/I-80 (Merge)	Oakland	13.6
31	I-880	SB	From I-880/I-80 (Split) to I-980	Oakland	22.3
32	I-880	SB	From I-980 to 23rd Avenue	Oakland	14.4
33	SR-13	NB	From Moraga Avenue to Hiller Drive (Signal)	Oakland	22.6
34	SR-13	SB	From Redwood Road to I-580 Eastbound (Merge)	Oakland	13.7
35	SR-24	EB	From I-580 On-ramp to Broadway/SR-13	Oakland	20.2
36	SR-24	EB	From Broadway/SR-13 to the Caldecott Tunnel (Entrance)	Oakland	12.9
37	SR-24	EB	From the Caldecott Tunnel (Entrance) to Fish Ranch Road	Oakland	26.8
38	SR-84	EB	From Newark Boulevard/Ardenwood Boulevard to I-880 Northbound (Off-ramp)	Newark	15.6

Source: Data is based on surveys taken during the afternoon peak period in September/October 1992.

Table 3.4—PM LOS F Freeway-to-Freeway Connectors, Alameda County CMP-Designated Roadway Network

	Roadway	Jurisdiction	Length (miles)	Average Speed (mph)	Free Flow Speed
1	I-80 SB to I-580 EB*	Oakland	0.45	18.2	45.0
2	SR-24 WB to I-580 EB	Oakland	0.75	14.0	45.0
3	SR-13 NB to SR-24 EB*	Oakland	0.33	13.2	45.0
4	I-880 SB to SR-260 WB	Oakland	0.99	16.6	
	SR-260 EB to I-880 NB	Oakland	0.41	17.2	

Source: Data is based on surveys taken during the afternoon peak period in September/October 1992.
* LOS condition was first reported during the 1991 surveys.

Table 3.5—PM LOS F Arterial Segments, Alameda County CMP-Designated Roadway Network

	Roadway		Limits	Jurisdiction	Arterial Class	Average Speed (mph)
1	SR-84	EB	From Sunol Road to Pleasanton-Sunol Road	Fremont	Rural	9.4
2	SR-84	EB	From SR-84 (Off)/I-680 to Vallecitos Lane	Unincorporated	Rural	13.4
3	SR-185 (International Boulevard)	SB	From Seminary Avenue to 73rd Avenue	Oakland	II	7.9

Source: Based on surveys during the afternoon peak period (4 p.m. to 6 p.m.) in July-August and October 1991.

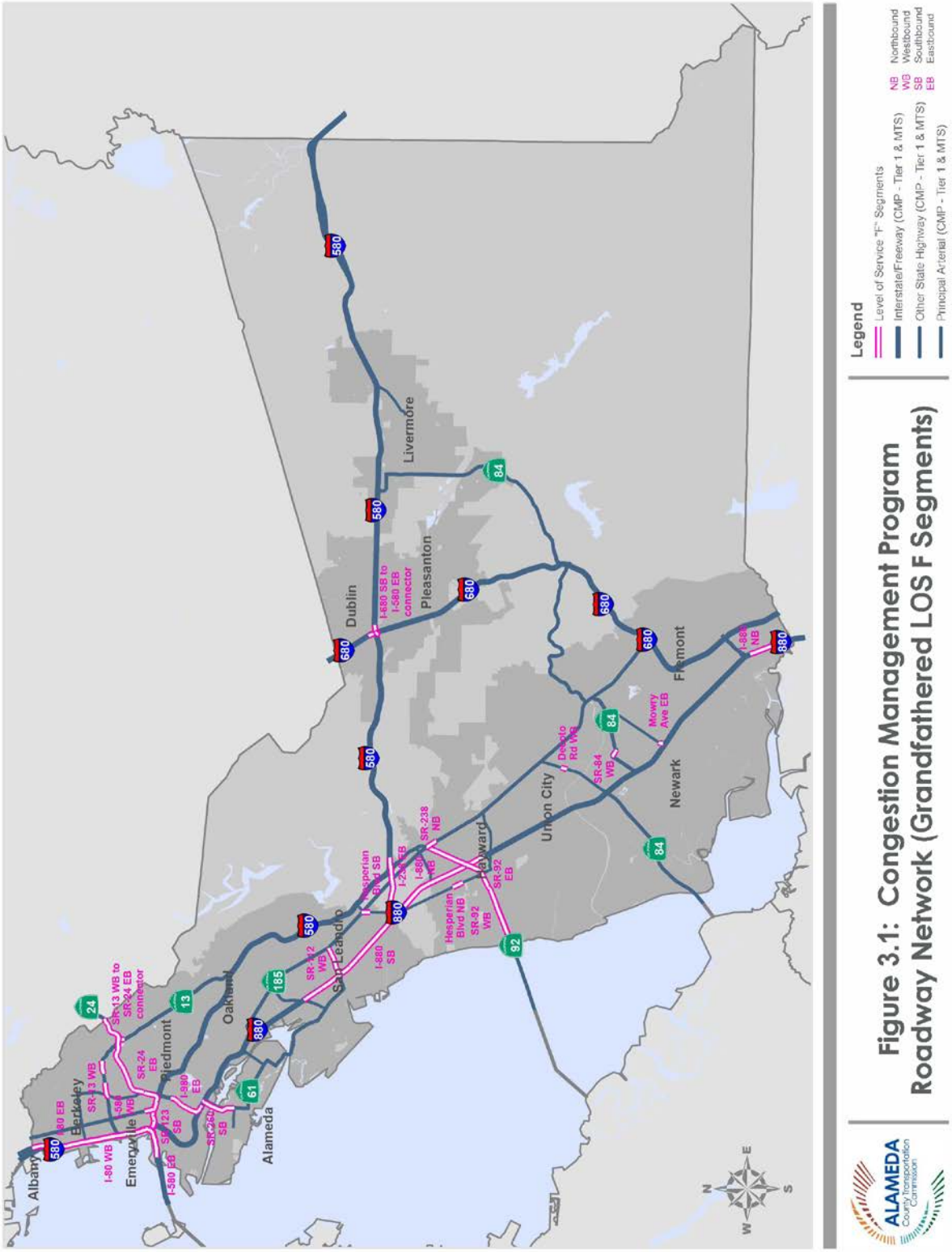


Figure 3.1: Congestion Management Program Roadway Network (Grandfathered LOS F Segments)

Comparison with Previous LOS Results

The results of LOS monitoring over the last two decades for the key commute corridors in Alameda County appear in Table 3.6, which shows overall traffic conditions and compares trends for long-distance trips on the CMP freeway network.

The 2018 LOS Monitoring Report stated that congestion on the CMP network generally decreased in 2018 as compared to 2016, resulting in fewer LOS F segments and an increased average speed on freeways, highways, and arterials. Speeds on urban arterial roads, however, had slower average speeds in 2018. Average speeds on most roads, including freeways, highways, and principal arterials, even with the increases seen in 2018, remain much slower and more congested than they were during the recession.

Table 3.6—LOS Trends on the CMP-Designated Network (afternoon peak period)

				Year/Miles per Hour														
Road		**Limits**	**Mi.**	**91**	**92**	**94**	**96**	**98**	**00**	**02**	**04**	**06**	**08**	**10**	**12**	**14**	**16**	**18**
I-80	EB	Bay Bridge Toll Plaza to Contra Costa line	6	24	20	22	21	20	27	19	32	23	21	29	22	23	19	24
I-80	WB	Contra Costa line to Bay Bridge Toll Plaza	6	25	24	23	25	28	18	22	28	28	36	27	26	26	27	37
I-580	EB	I-238 to I-205	30	56	55	55	55	NA	41	31	34	37	35	31	40	41	NA	37
I-580	WB	I-205 to I-238	30	57	56	55	55	NA	55	55	60	59	61	66	65	63	NA	62
I-580	EB	I-80 to I-238	16	53	52	44	53	60	63	55	43	39	47	42	41	40	34	43
I-580	WB	I-238 to I-80	15	58	56	51	52	61	63	60	57	55	63	60	54	60	57	63
I-680	NB	Scott Creek Road to Alcosta Boulevard	21	58	57	57	52	51	58	51	42	53	43	40	42	30	23	41
I-680	SB	Alcosta Boulevard to Scott Creek Road	21	59	58	55	61	67	63	62	66	59	63	66	66	67	66	67
I-880	NB	Dixon Landing Road to I-980	31	45	44	43	46	39	48	38	49	45	43	42	42	40	29	39
I-880	SB	I-980 to Dixon Landing Road	31	43	40	38	46	50	49	41	39	37	48	46	48	46	41	48
SR-13	NB	Mountain Boulevard to Hiller Drive	5	54	50	49	48	53	51	50	35	39	51	41	35	30	32	44
SR-13	SB	Hiller Drive to Mountain Boulevard	5	56	59	53	47	59	60	55	54	49	49	39	43	42	32	37
SR-24	EB	I-580 to Fish Ranch Road	5	30	29	30	24	39	33	21	40	26	24	18	18	15	14	19
SR-24	WB	Fish Ranch Road to I-580	4	54	58	54	50	60	57	61	59	59	58	67	60	56	62	63

Note: NA means data was not available due to the express lane ramp up period.

Infill Opportunity Zones

Senate Bill 1636 (Figueroa), signed by the governor in 2002, established "infill opportunity zones" (IOZs) to encourage transit-supportive and infill developments. The statute exempted infill opportunity zones from the requirements to maintain the LOS E. None of the local jurisdictions within Alameda County established or adopted infill opportunity zones by the statute's sunset period of December 2009. However, Senate Bill 743 (Steinberg), passed in September 2013, instituted key changes to the CMP statute that will support infill development, including lifting the sunset date on designating IOZs and directing the governor's Office of Planning and Research to develop new metrics for assessment of transportation impacts to replace the LOS measure. Alameda CTC is currently developing the implementation guidelines regarding the new CEQA traffic impact analysis significance metric and requirements for Alameda County agencies, in coordination with similar efforts occurring across the region. Alameda CTC will continue to closely follow implementation of this law pertaining to the infill-opportunity zones in the context of supporting infill development efforts in Alameda County.

Transit Performance Monitoring

Alameda CTC began monitoring transit performance on the Transit Monitoring Network (described in Chapter 2), beginning with the 2018 monitoring cycle. For the transit performance monitoring to be effective and to limit additional data collection required from the transit operators, Alameda CTC used a travel time measure that is consistent with data submitted by transit operators as part of the existing direct local distribution Master Program Funding Agreement (MPFA) with the operators. According to the agreement, the travel time metric is required to be reported biennially through the LOS Monitoring Report.

This travel time performance measure evaluates speeds of peak and non-peak bus services on the Transit Monitoring Network's roadway segments. With the same data, Alameda CTC will explore other possible reliability metrics. The performance standard for the travel time measure, as defined in the MPFA, is that average bus speeds should be at least 50 percent of prevailing auto speed or maintain or increase speed annually.

Note that similar to the auto LOS metric, the transit metric measures the operations of the roadway from a bus vehicle perspective. It does not measure outcomes of operational performance, such as ridership and on-time performance. These types of metrics, as well as outcome metrics for autos like VMT and mode share, are monitored in Alameda CTC's annual Performance Report at the system or county level. The metrics in the Performance Report meet the requirements of the MPFA.

Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP.[11] Among the requirements, Alameda CTC must monitor compliance with the LOS standards. If a roadway segment does not conform to the LOS standards based on the biennial monitoring, Alameda CTC will notify the affected local jurisdiction that may elect to remedy the LOS problem or prepare a deficiency plan (see Chapter 10). If after 90 days the local jurisdiction is still in non-conformance, Alameda CTC is required to follow the conformance process as identified in Chapter 9, "Program Conformance and Monitoring." When a deficiency plan is adopted, status reports on the implementation of the deficiency plan showing progress must be

[11] California Government Code Section 65089.3.

submitted to Alameda CTC annually as part of the annual conformity process. The detailed process for finding of non-conformance and the resulting withholding of Proposition 111 funds is described in Chapter 9.

Next Steps

- Continue to use speed-based HCM1985 for auto LOS monitoring for the Tier 1 network. Apply both HCM2000 and HCM1985 to the Tier 2 network as appropriate.
- Explore expanding the use of commercial speed or big data to survey all arterial and HOV/express lanes For HOV and express lanes, explore commercial speed data providers that capture lane-based speeds and use speed data collected from Alameda CTC's express lane operations.
- Explore potentially expanded or new and innovative monitoring of bicycle and pedestrian activity in the future.
- Explore opportunities for additional visualizations and summary snapshots in the 2020 LOS monitoring efforts and for developing an online portal for storing monitoring data and sharing information.
- Finalize guidelines to implement SB 743 in Alameda County including addressing the infill opportunity zones; identify impact to the CMP LOS monitoring element; and update the 2021 CMP to incorporate appropriate changes.

Multimodal Performance Element

4

Telegraph Avenue, Oakland

State law requires CMAs to evaluate their current and future multimodal transportation system performance for the movement of people and goods.[12] Specifically, the CMP must contain performance measures that evaluate how highways and roads function, as well as the frequency, routing, and coordination of transit services. The performance measures should support mobility, air quality, land use, and economic objectives and be used in various components of the CMP.

Combined with LOS standards, the performance element provides a basis for evaluating whether the transportation network is achieving the broad mobility goals in the CMP. These include developing the Capital Improvement Program, analyzing land use impacts, and preparing deficiency plans to address congestion or mobility issues. The legislation intends for the performance element to include multimodal performance measures in addition to the required roadway and transit measures. However, only the roadway LOS standards are used to trigger the need for a deficiency plan in Alameda County, as required by the CMP legislation.

The CMP statute outlines minimum requirements in terms of 1) the modes that should be covered by the performance element, 2) the types of applications that performance measures should be used for, and 3) the goals/objectives with which the performance measures should align. Alameda CTC meets and exceeds the statutory minimums in terms of modes of transportation, range of applications, and goals/objectives:

- **Modes of transportation:** Alameda CTC uses performance measures for five major transportation modes including auto (highway and arterial/local roads), transit, bicycle, pedestrian, and goods movement. In addition, Alameda CTC uses performance measures that capture cross-cutting issues such as environmental, economic, and equity objectives.
- **Types of applications:** Alameda CTC uses performance measures in six distinct types of applications, as summarized in Table 4.1. These applications are distinct in the scales of analysis, data sources/considerations, and frequency of reporting. Three are CMP-required uses of performance measures (refer to Table 4.1 for these application types).
- **Goals and objectives:** Alameda CTC identifies goals and objectives as part of its Countywide Transportation Plan (CTP) and as part of countywide modal plans. The countywide modal plans take a

[12] California Government Code Section 65089(b)(2).

focused look at goods movement, transit, arterial, bicycle, and pedestrian systems that together feed into the CTP. The goals and objectives of all Alameda CTC plans are designed to align with the CTP, and the CTP goals encompass all CMP statutory goals (as well as other countywide goals such as state of good repair, equity, and health).

Principles for Selecting Performance Measures

Alameda CTC follows the principles below when identifying different performance measures for different applications:

- **Aligned with goals and objectives:** Performance measures should relate back to a goal from the CTP or CMP statute;
- **Presented in easy-to-understand and consumer/user-oriented terms:** Performance measures should be readily understandable by members of the public. Measures should also strive to capture important aspects of the user experience;
- **Data availability, "dynamism" of measure, and level of effort to compute measure matched to reporting frequency:** Performance measures that require household travel survey data, applying a travel model, or performing complex mapping analysis are not feasible for annual reporting. Similarly, measures that are not expected to change significantly year-to-year warrant less frequent reporting (for example, the percent of households living within a 20-minute walk of an elementary school is a critical accessibility measure; however, it depends greatly on land-use patterns that change over long time horizons and is not appropriate for annual monitoring; a measure such as percent of new development within a half-mile of transit is more dynamic and more appropriate for annual monitoring);
- **Scale of analysis matched to application type:** For instance, a performance measure that relies on a travel model for computation will generally not be well-matched to a highly-localized application (such as evaluating a signal timing project or a bicycle lane project), as model accuracy declines with finer geographic scale. Similarly, measures that require manual field data collection are less difficult to produce countywide; and
- **Consideration of an array of measures:** Since one performance measure will not serve all needs, Alameda CTC considers an array of measures.

Table 4.1 on the next page describes Alameda CTC's use of performance measures for different applications.

Table 4.1—Alameda CTC Uses of Performance Measures

Application Type	Question Answered	Geographic Scale	Temporal Scale	Reporting Documents
Evaluate Scenarios	• How much should be invested in different modes over a 30-year horizon? • How do different land use patterns affect transportation system outcomes?	County-level analysis	Long-range projections	• Countywide Transportation Plan (every 4 years) • Countywide Modal Plans
Diagnose System Deficiencies*	• Which particular parts of the transportation system have needs/issues? • Where are new projects or programs needed?	Facility-level analysis	Regular monitoring cycles, existing conditions	• Multimodal Level of Service Monitoring (biennial), including speed/reliability analysis for key bus routes • Multimodal Corridor Studies
Prioritize Projects and Programs*	Which projects or programs should be funded in the short-, mid-, and long-term?	Facility- or project-level analysis	Existing conditions and "with project" conditions	• Comprehensive Investment Plan (biennial) • Countywide Modal Plans • Multimodal Corridor Studies
Track Trends and Progress Toward Goals	Is Alameda County making progress toward transportation goals?	County-level analysis	Regular monitoring cycles, existing conditions	• Performance Report (annual) • PDA Investment & Growth Strategy (biennial) • Safe Routes to Schools and Paratransit Annual Reports
Perform Project/Program Before/After Analysis	Did a particular project or program achieve its desired outcomes?	Project-level analysis	Short-term without and with project	• Grant agreements • Before/after studies
Analyze Transportation Impacts*	How will a development project affect the transportation system and what mitigations are needed?	Project-level analysis	Existing conditions and long-range projections	• Transportation Impact Analyses prepared pursuant to Land Use Analysis Element

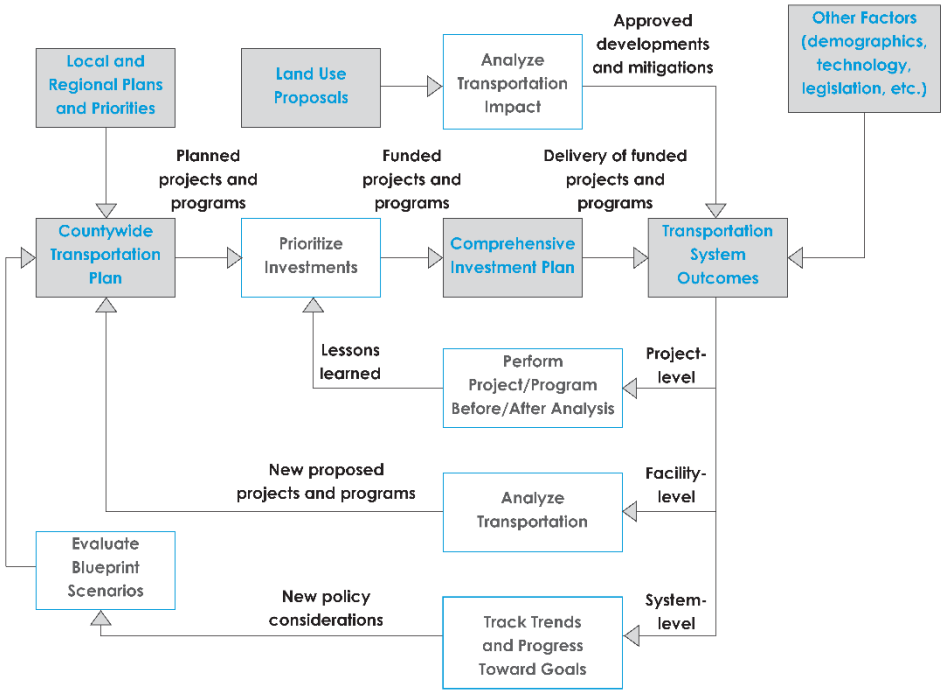
* Indicates CMP statue specifically refers to use of performance measures in this type of application.

Relationships of Performance-Based Planning Activities

Broadly, the use of performance-based analysis allows Alameda CTC to set high-level policy, to make smart investment decisions, and to monitor and react to transportation system outcomes. Figure 4.1 conceptually illustrates how these functions are interrelated. Key points of interface between activities include the following:

- Projects and programs from the Countywide Transportation Plan (a 25-year document) are prioritized for short-term funding decisions (2- to 5-year timeframe) in the Comprehensive Investment Plan.
- Facility-level performance monitoring can help identify specific parts of the transportation system as underperforming, leading to the inclusion of new projects and programs in future Countywide Transportation Plans to improve these facilities. For instance, performance analysis may indicate that bus operations on a particular corridor are unacceptably slow, leading to a new project for bus signal priority.
- Project-level before/after analysis can provide information as to the effectiveness of specific types of projects in specific contexts, which can help determine which projects should receive limited funding. For instance, counts taken before and after the installation of a bike lane may suggest that the bike lane led to an increase in levels of bicycling, which assists in the future evaluation of similar types of projects in similar contexts.
- Progress (or lack of progress) in achieving a goal, as illuminated through system-level trend analysis can give rise to new policy ideas for inclusion in future Countywide Transportation Plans. For instance, persistent congestion could lead to consideration of new demand management strategies as part of a future Countywide Transportation Plan.

Figure 4.1—Relationship of Performance-based Planning Activities

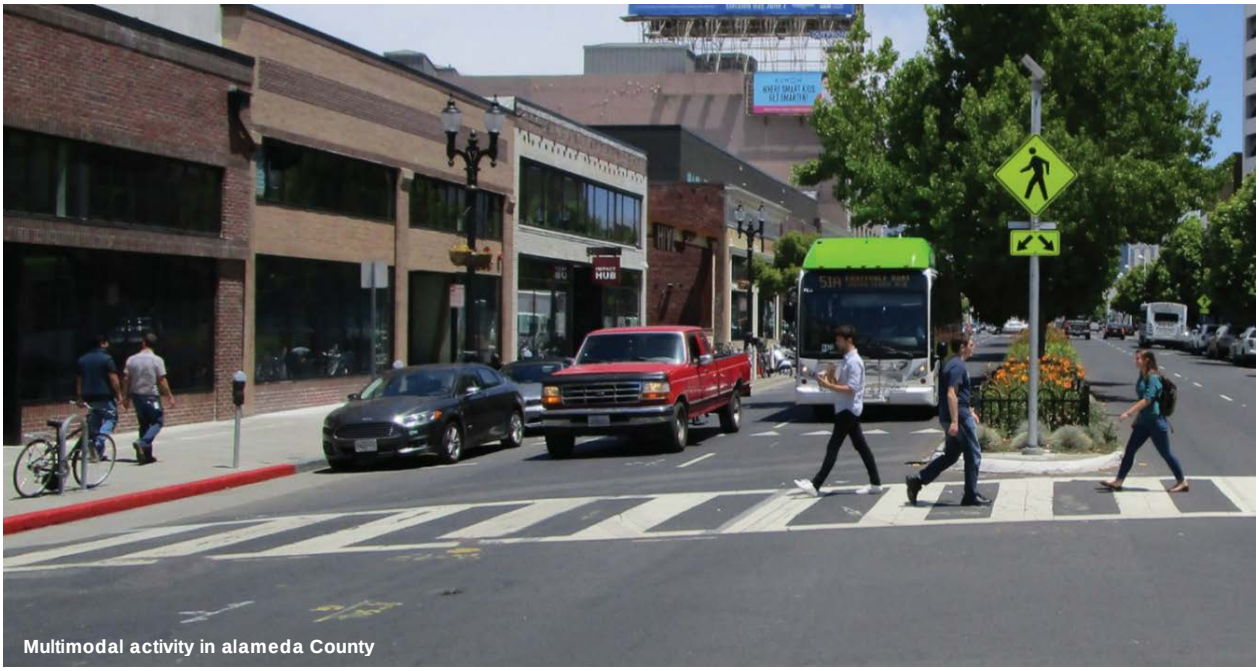


Performance Measures

As described previously and in Table 4, Alameda CTC uses a variety of performance measures in various planning activities and reporting documents, and they are applied or monitored over different timelines. A comprehensive inventory of measures is presented in Appendix F3. The measures are organized as follows:

- Multimodal Accessibility and Transportation/ Land Use Integration
- Roadway
- Transit
- Bicycle
- Pedestrian
- Goods Movement
- Environment, Equity, and Health

Alameda CTC monitors a majority of these performance measures with data collection or by using the Countywide Travel Demand Model. The measures encompass all modes of transportation. Measurements of current conditions rely primarily on available data and established data collection processes. Peak and off-peak travel periods are considered for typical weekdays. Additional details for the legislatively required highway and roadway system and transit performance measures appear in a separate section of this chapter.



Multimodal activity in alameda County

System Definition

While the statute clearly requires designation of a CMP-network for purposes of LOS monitoring, it provides no guidance for selecting a system for the performance element. In light of this, Alameda CTC uses the Metropolitan Transportation System (MTS) for the performance element. Alameda CTC also recognizes the MTS in the Land Use Analysis Program as the focus of transportation analyses.

Sources and Acceptability of Data

Alameda CTC uses a variety of data sources for its performance monitoring activities, as detailed in Appendix F3. General rules regarding data sources used include:

- Alameda CTC uses data sources that have industry acceptability.
- New data sources are validated against established data sources when possible.
- Performance measures generated from travel demand models are not appropriate for annual or biennial monitoring (due to model's horizon years) or for localized measures (due to accuracy issues with applying a countywide model at such scales).
- Data sources requiring original data collection (e.g., GPS floating car speed surveys, bicycle and pedestrian counts) are generally used for localized applications or on specifically defined networks due to cost of data collection.

Legislatively Required Performance Measures

Highway and Roadway System Performance

Alameda CTC reports on level of service on the Congestion Management Program network as required by the CMP statute in its biennial LOS monitoring reports. Alameda CTC also reports on other highway and roadway performance measures such as pavement condition index, travel times, vehicle hours of delay, collisions, and gateway traffic volumes in its annual Performance Report.

Transit Service Performance Measures

The following transit service performance measures are legislatively required measures, and detailed information for these measures are provided by the transit operators in the county based on their service standards as explained in their short-range transit plans or other policy documents.

Table 4.2 on the next page shows performance measures for bus and rail transit in Alameda County. These measures apply to both existing services and future year (proposed) services.

For ferry services from Alameda and Oakland to San Francisco, the frequency measure is one vessel per half-hour during the a.m. and p.m. peak periods.

Table 4.2—Performance Measures for Frequency of Transit Service (time of day)

Service Type	Peak	Midday	Night	Owl	Sat/Sun/ Holiday
Bus (minutes between services)					
Primary Trunk	12	15	30	60	20
Major Corridor	15	30	60	N/A	30
Local/Crosstown	30	30-60	60	N/A	60
Suburban Local/ Crosstown	30-60	30-45	N/A	N/A	N/A
Transbay Basic	15	30	60	N/A	N/A
Transbay Express	15-30	N/A	N/A	N/A	N/A
Transbay Owl	N/A	N/A	N/A	60	N/A
Rail (minutes between services)					
BART	3.75-15	up to 24 (off-peak)			
Ferries	30	Varies	N/A	N/A	Varies

Note: Overlapping bus routes provide more frequent service on some corridors.

Routing

Performance measures for routing and area coverage vary by transit operator.

AC Transit has guidelines for route spacing. In the densest areas, with a population of more than 20,000 people per square mile, routes should be only one-quarter mile apart. In medium-density areas with 10,000-20,000 people per square mile, such as many of the grid sections of Oakland and Berkeley, routes should be between one-quarter and one-half mile apart. In low-density areas with 5,000-10,000 people per square mile, typical of sections in Castro Valley, Fremont, and Hayward, route spacing should be between one-half and three-quarters of a mile. For very low-density areas with less than 5,000 people per square mile, route spacing can be one mile or more.

In making specific route decisions, AC Transit uses these guidelines but also bases current- and future-year bus route spacing (the average distance between bus lines) on residential densities, the location of major activity centers, topography, and street patterns. Route spacing in commercial areas is determined by location, level of activity, and layout of the development, on a case-by-case basis.

BART passenger loads are measured at selected "screenlines"—imaginary lines between two stations. Generally, screenlines are chosen at the points where maximum loads in a given direction are sustained for a significant duration—often on the edge of a central business district.

Based on its experience, BART employs the following average loading goals, which it attempts to achieve whenever possible. Identical goals and standards are applied to all lines.

- Peak hour: 115 passengers per car
- Off-peak periods: 80 passengers per car

BART sets its one-hour Peak Vehicle Load Standard at 115 passengers per car. This equates to an average of 5.4 square feet of floor space for each of the standees in a car. This is the minimum area required for an individual passenger's standing comfort prescribed by the Transit Capacity and Quality of Service Manual, published by the Transit Cooperative Research Program (TCRP). The Transit Capacity and Quality of Service Manual recognizes this allowance as "a comfortable level without body contact, reasonably easy circulation, and similar space allocation as seated passengers. BART uses a floating peak-period calculation to determine daily peak periods. On average, the a.m. peak period runs between 6:41 a.m. and 9:41 a.m., and the p.m. peak period runs between 4:00 p.m. and 7:00 p.m.

LAVTA proposes the following performance measures for existing and future services:

- Expand routes and services to meet current and future demand for timely and reliable transit service.
- Provide service with a time span sufficient to effectively serve the primary target markets for each route:
  - 4:30 a.m.-1:00 a.m. or 24 hours in backbone corridor(s);
  - 5:00 a.m.-12:00 a.m. on primary feeder lines;
  - 6:00 a.m.-9:00 a.m. and 4:00 p.m.-7:00 p.m. on secondary feeder lines and regional routes; and
  - Bell time for supplemental school lines.
- Provide trip frequencies sufficient to effectively serve the primary target markets for each route:
  - 15-30 minutes on backbone lines, 30-minute peaks if demand warrants;
  - 30-60 minutes on other primary lines;
  - 60-minute peak service on neighborhood, local feeder, and regional express lines; and
  - Single daily roundtrips for supplemental school lines.

Union City Transit uses the following performance measures for existing and future service:

- 90 percent of all land with three or more dwelling units per acre within one-quarter mile of a transit route; and
- 90 percent of major activity centers within one-eighth mile of a transit route.

Transit Service Coordination

A number of measures are in place to ensure coordination among transit operators, including Senate Bill 602 (Service/Fare Coordination, 1989), Senate Bill 1474 (Transit Coordination, 1996), Senate Bill 916 (RM2, including Transit Connectivity, 2003), MTC Resolution No. 3055 (Inter-operator Transit Coordination Implementation Plan), and others. All transit operators in Alameda County will continue to implement the coordination projects required under these guidelines. Annually, the projects are agreed on among the operators and MTC. They relate to coordinating the following:

- Fare
- Schedule
- Service
- Public information
- Marketing
- Administration

Review Process

Alameda CTC reports on the countywide multimodal transportation infrastructure annually. Until 2017, it was reported in a comprehensive Performance Report format that analyzes performance measures and documents Alameda County multimodal transportation

network performance for review by local agencies and transit operators prior to publication. Since 2018, it has been modified to report in a consolidated fact sheets format that highlight key trends for better readability and absorption. Those fact sheets draw from, similar to prior years, the most current available data from various agencies. The Performance Report includes estimates of population growth during the preceding year, available from the State Department of Finance. As mentioned previously, the LOS Monitoring Report documents roadway performance for the CMP roadway network.

Local Government and Transit Agency Responsibilities

To minimize cost, Alameda CTC relies on established data collection processes and regularly published reports for data. A list of established data collection efforts, by agency, is listed below. In 2011, the Alameda CTC Commission recommended that in odd-number years, depending on funding availability, efforts be made to augment the data collection for all modes, as needed, for improved analysis of performance of the countywide transportation system.

Cities and County

- Pavement Management System data for the MTS
- Countywide Bicycle and Pedestrian Plans (Alameda County and cities' public works departments)

Transit Agencies

- Service schedules (on-time performance)
- Transit ridership routing (percentage of major centers served within one-quarter mile of a transit stop)
- Frequency (number of lines operating at each frequency level)
- Service coordination (number of transfer centers)
- Average time between off-loads (BART)
- Miles between mechanical road calls (AC Transit, LAVTA, and Union City Transit)
- Mean time between service delays (BART and ACE)
- Transit availability (frequency of transit and population within one-half mile of rail station or bus and ferry stops and terminals)
- Transit capital needs and shortfall (for high-priority, Score 16 transit projects for Alameda County transit operators)
- Mean bus speeds on major transit corridors for CMP Transit Monitoring (LAVTA, AC Transit)

MTC

- Pavement Condition Index
- Delay on major freeway corridors (if developed by MTC)

Caltrans

- Freeway speed runs, duration of freeway congestion (if developed by Caltrans)
- Accident rates on state freeways
- Roadway miles in need of rehabilitation

Alameda CTC

- Roadway speeds on CMP network
- Countywide Bicycle and Pedestrian Plans
- Bicycle and Pedestrian Counts
- Countywide Travel Demand Model analysis for mode share, activity center accessibility, etc.

Local agencies are encouraged to provide maintenance data to MTC or maintain their own database of maintenance needs on the MTS. However, there are no compliance requirements for local agencies or transit operators related to the multimodal performance element.

Next Steps

The performance measures identified in the multimodal performance element are based on measures established in a variety of plans and documents including the Countywide Transportation Plan, countywide modal plans (bicycle, pedestrian, arterial, transit, and goods movement) and the CMP document.

As part of the 2021 CMP update, Alameda CTC will reevaluate and identify and changes to multimodal performance measures in light of the changes to CEQA guidelines based on SB 743 that replaces the LOS metric with VMT starting in July 1, 2020, for transportation impacts assessment under CEQA.

Travel Demand Management Element

5

Bicycling in Alameda County

Continued population growth in the Bay Area and Alameda County, as well as surrounding regions, coupled with a strong economy have led to growing numbers of intra- and interregional commutes, which place heavy demands on the region's transportation system. Investments in Alameda County transportation facilities and services will continue to seek to accommodate this growing travel demand; however, to better manage it, a set of complementary strategies and measures is also necessary.

Travel demand management (TDM) measures seek to reduce pressure on existing roadway and parking capacity by using incentives and disincentives to influence travel choice. They reduce peak-period vehicle trips and total vehicle miles traveled. Related benefits include reducing congestion and carbon emissions, improving public health, and increasing transportation options. The most effective TDM programs include some form of financial incentive, either through pricing parking or subsidizing transit, ridesharing, and other non-drive-alone modes such as biking and walking.

TDM strategies can provide cost-effective ways of meeting regional sustainability and mobility goals. By making the most efficient use of the available system capacity, they complement investments in high-occupancy vehicle lanes, express lanes, transit systems, first- and last-mile solutions, multimodal infrastructure improvements and other alternatives to single-occupant driving.

The Commission adopted a Countywide Comprehensive TDM Strategy in May 2013 that provides an inventory of the broad range of TDM programs and activities present in Alameda County and recommends a strategy for better integrating, supporting, and building on these existing efforts, including implementation of the regional commute benefit program and the Guaranteed Ride Home Program. These programs are designed to make the most efficient use of existing facilities. An update to the TDM strategy is underway. The TDM element also incorporates strategies to integrate air quality planning requirements with transportation planning and programming.

State law requires that, at a minimum, the TDM element of the Congestion Management Program[13] accomplish the following:

- Promote alternatives to single-occupant vehicle travel (e.g., carpools, vanpools, transit, bicycles, and park-and-ride lots);
- Promote improvements in the jobs-housing balance and transit-oriented developments;

[13] California Government Code Section 65089(b) (3).

- Promote other strategies, including flexible work hours, telecommuting, and parking management programs; and
- Consider parking "cash-out" programs (paying employees who do not use parking).

A balanced TDM element requires actions that local jurisdictions, Alameda CTC, the Bay Area Air Quality Management District, Caltrans, MTC, and local transit agencies undertake. Cities and other local jurisdictions may establish their own TDM programs that go beyond what Alameda CTC and BAAQMD develop. To meet the intent of the CMP legislation, the CMP requires local governments to undertake certain TDM actions, known as the Required Program.

Framework

Alameda CTC has a framework for implementing TDM in Alameda County that defines the roles and responsibilities of public and private organizations, summarizes the funding approach, and details how local jurisdictions must demonstrate compliance with the TDM program requirements. Appendix F provides a menu of various TDM measures and is intended as a resource for organizations developing TDM plans.

TDM in Alameda County is a collaborative and cooperative effort. Specific strategies are appropriate for the region as a whole, the county and local jurisdictions, and for individual employers or trip generators. Alameda CTC works to coordinate the activities of these types of organizations with the other elements of the CMP, so that capital investment, system management, and demand management work together to provide diverse transportation choices, contain congestion, and improve air quality. The county's approach to TDM includes the following major elements:

Regional actions: BAAQMD, Caltrans, and MTC take actions to support TDM throughout the San Francisco Bay Area. Alameda CTC's efforts work within the context of these broader regional initiatives.

Countywide actions: Alameda CTC takes actions to encourage, supplement, and support local governments in their TDM efforts, including allocating funds for multimodal transportation improvements, providing guidance and technical assistance to localities in developing their own TDM programs, and monitoring compliance with the Required Program in the CMP. Alameda CTC also manages certain key TDM programs that work most effectively at the countywide level, such as Guaranteed Ride Home, Safe Routes to Schools, Student Transit Pass Pilot, Alameda County Bicycle Safety Education classes, and carpool, bike, and other "green" mode promotions. In addition, Alameda CTC hosts the Commute Choices website which highlights commuting options in Alameda County.

Local jurisdiction actions: Local governments have primary responsibility for implementing TDM programs and encouraging and incentivizing TDM efforts by private organizations. The CMP requires local governments to undertake certain TDM actions under the Required Program. The CMP also encourages local governments to undertake TDM efforts above and beyond these requirements.

Private TDM actions: Private employers, developers, homeowner associations, and nonprofit organizations can undertake TDM measures on a voluntary basis or as required by a city. Alameda CTC provides resources if requested to support these actions, including guidance on best practices and other technical resources.

Regional Actions

The Regional TDM Program includes actions that MTC, BAAQMD, and Caltrans take to support TDM programs throughout the San Francisco Bay Area. While the primary role of these agencies is to provide the infrastructure and services that allow for transportation options, they also work to manage demand for those facilities. Key regional TDM efforts include:

- Bay Area Commuter Benefits Program: Bay Area employers with 50 or more full-time employees within the BAAQMD geographic boundaries are

required to register and offer commuter benefits to their employees to comply with Air District Regulation 14, Rule 1. Employers must offer one of four commuter benefit options to their employees, each intended to reduce vehicle miles traveled and employee commute costs: 1) exclusion of employees' transit or vanpool costs from taxable income, to the maximum amount, as allowed by federal law (currently $255 per month); 2) employer-provided transit subsidy (or transit pass) or vanpool subsidy up to $75 per month; 3) employer-provided free or low-cost bus, shuttle, or vanpool operated by or for the employer; or 4) an alternative employer-provided commuter benefit that is as effective in reducing single-occupant vehicles as options 1-3.

- **511 Regional Rideshare Program:** MTC's 511 Regional Rideshare Program offers an online tool for commuters to find rideshare matches through its transportation information website, 511.org. MTC has partnered with several private ride-matching companies to promote apps that provide an easy and flexible way to find a carpool in the Bay Area. MTC's carpool app partners are featured on Rideshare.511.org, and MTC actively promotes the apps to commuters. MTC is partnering with BART and one of the carpool app partners (Scoop) in piloting a carpool program that guarantees parking at select BART stations for commuters that carpool with Scoop. Alameda CTC is helping to promote the carpool apps featured on Rideshare.511.org and has promoted the carpool app partnerships happening in Alameda County. In addition to offering travelers assistance with carpool ride matching, MTC's rideshare program includes information on a network of free park-and-ride lots where carpoolers can meet.
- **511 Regional Bicycling and Transit Trip Planners:** The 511 program offers a bicycling trip planner with a regional bike mapper tool that provides turn-by-turn biking directions along the shortest and/or flattest route. The 511 Bicycling pages provide information on safety, Bike to Work Day, taking bikes on transit, bicycle access on bridges, and bicycle parking options. The 511 program also offers a transit trip planner that provides point-to-point transit directions and real-time arrival information for all the Bay Area's transit agencies. The 511 Transit pages provide resources, important transit alerts, and other critical information for transit riders.
- **BAAQMD Spare the Air Resource Program:** The Bay Area Air Quality Management District's Spare the Air Resource Program engages the public through education and promotions to encourage changes in behavior that will reduce air pollution. BAAQMD provides "Spare the Air Alerts" when air quality is forecast to be unhealthy and to encourage people to alter their behavior on these days to prevent unhealthy air quality. The Air District works directly with employers by providing tools and resources to educate employees on reducing air pollution. As part of this program, BAAQMD has established local resource teams composed of local residents, civic groups, agencies, businesses, and environmental organizations that work together regularly to plan educational activities and programs that reduce air pollution in their communities. Two resource teams are located in Alameda County: the Southern Alameda Resource Team and the Tri-Valley Resource Team.

Countywide Actions

Alameda CTC's actions complement regionwide TDM activities and support the efforts of local jurisdictions. Alameda CTC's TDM activities include:

- **Funding for multimodal transportation infrastructure and services:** On November 4, 2014, more than 70 percent of Alameda County voters approved Measure BB, which increased the county's half-cent sales tax for transportation to a full cent. The 2014 Transportation Expenditure Plan, which outlines the projects and programs funded by Measure BB revenues, allocates 48 percent of revenues to BART, bus, senior, and youth transit and 8 percent of total revenues to bicycle and pedestrian paths and

safety. An additional 4.5 percent of revenues will support bicycle and pedestrian paths and safety improvements on local streets and roads. Alameda CTC recently approved its 2018 Comprehensive Investment Plan, a near-term strategic planning document that establishes a financial investment strategy and targets available funds for transportation investments that support the vision and goals of Alameda CTC's Countywide Transportation Plan, multimodal plans, and voter-approved expenditure plans. The 2018 Comprehensive Investment Plan includes approximately $405 million in total programming over the five-year plan window, of which $261 million is recommended for allocation in the fiscal years 2017-2018 and 2018-2019. In the 2018 Comprehensive Investment Plan, 14 percent funds bicycle and pedestrian projects, 15 percent funds transit, and 42 percent funds local streets and roads including many multimodal improvements.

- **Planning for multimodal transportation infrastructure and services:** Making transit, bicycling, and walking more convenient and safer in more places enables these modes to be viable alternatives for an increasing number of people in the county. In 2016, Alameda CTC approved a Countywide Transit Plan and a Countywide Multimodal Arterial Plan, which help optimize investments in the transit system and advance complete street improvements. In 2017, Alameda CTC is also advancing two multimodal corridor projects for high-priority arterials which will identify specific transit and complete streets improvements to move toward implementation. Also in 2017, Alameda CTC began updating the Alameda County Countywide Bicycle and Pedestrian Plans last approved in 2012.
- **Express lanes and congestion pricing strategies:** In 2010, Alameda CTC opened its first express lane on I-680 going southbound over the Sunol Grade. In 2016, Alameda CTC opened 29 lane miles of express lanes on I-580 in both directions through the Tri-Valley between Dublin and Livermore. Express lane infrastructure and toll-free use for carpools and transit are enticing more commuters to share their ride. After the first year of operations for the I-580 express lanes, 38 percent of users are traveling toll free as carpools, transit, or eligible clean air vehicles, compared to just 14 percent in February 2016. To build on the success of these projects, Alameda CTC will begin construction on the I-680 northbound express lane over the Sunol Grade at the end of 2017. This project will complement the express lanes on I-680 in Contra Costa County between Walnut Creek and San Ramon, which opened in fall of 2017.
- **Guaranteed Ride Home (GRH):** The Alameda County GRH program, administered by Alameda CTC with funding from BAAQMD, gives non-solo-driving commuters an "insurance policy" against being stranded at work if they need to make an unscheduled return trip home. By providing the assurance that commuters using non-drive-alone modes can get home in an emergency, GRH removes one of the greatest barriers to choosing an alternative to driving alone, addressing concerns such as, "What if I need to get home because my child is sick, or I have unscheduled overtime and miss my carpool ride home?" For employees, the availability of guaranteed rides home is an incentive to find an alternative to driving alone to work that avoids contributing to traffic congestion. The Alameda County GRH program has been in operation since April 1998.

  The program has matured from a demonstration program with a handful of participating employers to a robust one with 3,554 registered employees and 648 registered employers throughout Alameda County as of December 2017. The 2017 GRH annual report indicates that the program resulted in a 10 percent reduction in participants driving alone, reducing VMT by 5,055,035 miles for the year. The program is continuing to evolve, and last year transportation network companies were added

as an approved mode for getting home in an emergency. The change was welcomed by participants; more than 40 percent of GRH survey respondents indicated the change would make it easier for them to use the program.

- **Technical support for new and existing Transportation Management Associations:** Transportation Management Associations (TMAs) are an effective mechanism to reduce traffic congestion and improve use of non-drive-alone modes by employees and sometimes residents. Depending on available resources and interest, Alameda CTC will support creation of new TMAs in the county and strengthen existing TMAs through technical assistance.
- **Commute Choices webpage:** Alameda CTC maintains the Commute Choices webpage (https://www.alamedactc.org/programs-projects/commute-options-and-benefits/) which inventories the full range of TDM programs available in Alameda County and provides guidance to employers, individual residents, and employees, and other agencies and organizations, so they can better understand the range of available transportation programs and options. The webpage is beginning to be modified for better use as a resource center, so that employers and local governments can get more information on TDM strategies. Alameda CTC is also developing TDM strategies "tool kits" that can be downloaded from the website.
- **Safe Routes to Schools:** The Alameda County Safe Routes to Schools (SR2S) program began in 2006 and has grown every year since. The program aims to increase use of active (walking and biking) and shared (taking transit and carpooling) transportation modes to access schools; promote walking, bicycling, and the use of transit as viable, everyday transportation options; increase safe pedestrian/bicycling behaviors; decrease incidence of collisions; and, increase student and parent confidence in safe walking/bicycling/transit riding abilities. The program is funded through a combination of Measure B and federal funds. As of the 2018-19 school year, 215 schools are enrolled in the program out of 397 Alameda County schools. Additionally, the program delivered over 1,900 events, including countywide encouragement events, such as Bike to School Day, and direct student safety training events focused on teaching safe walking and biking skills. In addition, the program conducts school safety assessments, which are an important component of the program because they identify specific infrastructure improvements that can encourage safe multimodal access to schools. The program conducts about 20 school safety assessments annually. Some of the other program activities and events include walking school buses and bike trains, ongoing Walk and Roll to School Day events, annual International Walk and Roll to School Day events, the countywide Golden Sneaker Contest, bike repair and basic bike mechanics training, transit training, rail safety education and educator guides on bike/pedestrian safety.
- **Promotional programs and campaigns:** Alameda CTC funds and promotes "green" transportation modes through public outreach, earned and paid media, and advertising. Alameda CTC funds an advertising campaign with TFCA funding in partnership with Bike East Bay around Bike to Work month. The campaign encourages people to ride bikes for health, fun, transportation, and recreation. These ads can be seen in all parts of Alameda County on buses, bus shelters, and Capital Corridor trains throughout April and May leading up to and throughout Bike Month. In 2017, Alameda CTC developed a carpool promotion campaign. The initial campaign was focused in the I-580 corridor to leverage the benefits of the new I-580 Express Lanes and focused on the "Carpool Instead" message utilizing bus exteriors, social media ads, drive-time radio, gas station ads, and videos. The carpool promotion program will

continue to be corridor focused, leveraging capital improvements that provide added incentive to carpool. The campaign will encourage people to carpool more during construction projects as well, such as the I-680 Sunol Northbound Express Lane project beginning construction in late 2017.

- **Bicycle Safety Education classes:** Bike East Bay provides free bicycle safety classes in Alameda County with the financial support from Alameda CTC Measure BB and TFCA funds. Specialized classes are available that focus on urban cycling, adults learning to ride, and families biking together. By training cyclists to ride safely and comfortably, the program is intended to reduce vehicle trips in Alameda County and facilitate active transportation.
- **Technical assistance:** Alameda CTC has expanded its TOD technical assistance program into a Sustainable Communities Technical Assistance Program to support a wide range of planning and project development activities in priority development areas. The agency has funded parking and TDM studies to assist local jurisdictions in developing parking-management policies and programs that complement investments in public transit and TOD as well as walking and bicycling infrastructure. Alameda CTC has funded three parking studies: a shared parking study at MacArthur BART, a parking and stormwater study at the Coliseum/Oakland Airport BART, and the Alameda CTC Tri-Valley Integrated Transit and Park-and-Ride Study. The agency also funded the Clement Avenue Complete Street Corridor Concept Feasibility Report. Alameda CTC will continue to provide financial and technical support, as resources are available, through two primary forms:
  1) **Technical resources:** Providing informational materials, case studies, and examples; model ordinance language; and other guidelines and information that can assist jurisdictions in implementing parking and TDM policies.
  2) **Planning grants:** Providing funds to cities to conduct studies and other planning efforts to overcome local parking and TDM challenges and move forward on adoption of parking management and TDM programs and policies, potentially including formation of new TMAs.
- **Student Transit Pass Program:** In 2018/19, Alameda CTC concluded a three-year pilot program that offered free or reduced-fee transit passes to a select number of schools. The pilot met its goals of reducing transportation access barriers to and from schools, improving transportation options for middle and high school students, and building support for transit in Alameda County. In early 2019, the Commission approved an expansion of the program to reach all eligible middle and high schools in Alameda County phased over five years. All passes will be free to qualifying students; in most Districts, low income students will qualify.

Local Jurisdiction Actions

Local governments have the primary responsibility for implementing TDM programs at the local level and for encouraging and incentivizing TDM by the private sector. Through the Required Program, the CMP requires local governments to undertake certain TDM actions. Alameda CTC encourages and supports local governments to undertake TDM efforts above and beyond these requirements.

Required Program

The Required Program includes those actions local jurisdictions must take to be in compliance with the CMP and consists of two basic elements: 1) adopting design guidelines or comparable policies that enhance transit and pedestrian and bicycle access; and

2) implementing capital improvements that contribute to congestion management and greenhouse gas reduction.

1) **Adopt design guidelines or comparable policies:** The CMP requires local jurisdictions to adopt and implement guidelines for site design that enhance transit, pedestrian, and bicycle access. To meet this requirement, local jurisdictions must carry out one of the following actions:
   - Adopt and implement design strategies that encourage alternatives to single-occupant automobile use through local development review;
   - Adopt and implement design guidelines that meet the individual needs of the local jurisdiction and maintain the intent of the TDM element to reduce the dependence on single-occupant vehicles;
   - Demonstrate that existing policies meet the intent of the TDM element to reduce the dependence on single-occupant vehicles.
2) **Implement capital improvements:** Local jurisdictions are also required to implement capital improvements that contribute to congestion management and emissions and greenhouse gas reduction. This requirement can be satisfied by participating in the regional Transportation Fund for Clean Air program, and the federal Surface Transportation Program and Congestion Mitigation and Air Quality Improvement Program.

Refer to "Local Government Responsibilities and Conformance" in this chapter for a description of the steps required to demonstrate compliance with the Required Program.

Voluntary local actions

Alameda CTC also encourages local jurisdictions to undertake TDM efforts above and beyond the Required Program. To support these efforts, Appendix G provides a listing of potential local TDM program elements and the context in which each program is likely to be most effective.

Cities across Alameda County have already adopted plans and programs to address TDM. Every city in Alameda County has adopted a Climate Action Plan, as has Alameda County for its government operations and for unincorporated portions of the county. Nearly every city in Alameda County has a TDM program and/or has re-considered its parking management strategies at the city or neighborhood level. Some examples include the Bay Area Bike Share program expansion into the cities of Berkeley, Emeryville, and Oakland; the City of Pleasanton's partnership with Scoop, a dynamic carpool app; and the City of Fremont's Vision Zero Action Plan.

With the passage of Senate Bill 743 in 2013, which requires that VMT be measured as an alternative to LOS to determine traffic impacts under CEQA, local governments will have an increased role in working with developers on implementing TDM strategies.

Private Sector Actions

The private sector also has an important role to play in managing travel demand. While the CMP does not require private organizations to undertake any specific TDM actions, private organizations can take a number of steps, either on a voluntary basis or in response to local jurisdiction requirements. A full menu of potential TDM actions appears in Appendix F.

Examples of existing private TDM efforts in and adjacent to Alameda County include:

- **Emeryville Transportation Management Association** is a nonprofit organization funded through Business Improvement District fees paid by all commercial and industrial property owners in the city. The Emeryville TMA and Alameda CTC fund the Emery Go-Round shuttle, a free service which runs from the MacArthur BART station along two routes that serve the Amtrak station, Bay Street, and major employers in and around Emeryville. The TMA also provides information and referral services, coordination with

local and regional government and transit agencies, the Alameda CTC GRH program, and car-sharing spaces.

- **Hacienda Business Park** in Pleasanton provides a "Commute Solutions" program that offers a comprehensive suite of commute services to encourage commuting by non-drive-alone modes. For these efforts, the Hacienda Business Park is recognized by the Best Workplaces for Commuters program.
- **Berkeley Gateway TMA** funds the West Berkeley shuttle that provides free service from the Ashby BART station to major employment centers in West Berkeley. The shuttle service is operated under a partnership with the Emeryville TMA.
- **The Broadway "B Line"** is a free shuttle that operates between Jack London Square and the Uptown/ Lake Merritt districts of Oakland. It is funded through a public-private partnership between the City of Oakland, business associations throughout the areas it serves, a BAAQMD grant, and Alameda CTC. AC Transit operates the shuttle.
- **Bishop Ranch Office Park**, located in the San Ramon valley in Contra Costa County, provides seven free shuttle routes for employees, connecting to local BART stations, the Pleasanton ACE station, the Amtrak station in Contra Costa County, and several regional park-and-ride locations. In addition to shuttles, Bishop Ranch offers several programs aimed at reducing employee VMT including carpool matching services, bike sharing, vanpools, and a new service that gases up your car while you work, so you don't have to make that extra trip. Bishop Ranch is piloting a driverless shuttle to transport employees between buildings.
- **Other free shuttles for employees:** Recognizing the need to address employee commute issues as a necessary part of doing business, several employers in Alameda County offer shuttle services for their employees. Examples include Alta Bates Summit Medical Center, California State University East Bay, Heald College, Kaiser Oakland Medical Center, Mills College, Lawrence Berkeley National Laboratory, and University of California Berkeley "Bear Transit."

Funding Approach

TDM programs are often extremely cost-effective ways to meet regional congestion management and mobility goals and offer incentives to maximize use of existing facilities. Even when TDM programs place requirements on the private sector, well-designed programs may be cost-neutral or even save money for private organizations. For example, by shifting commuters away from single-occupant vehicle travel, TDM programs can reduce an employer's need to build or lease costly parking facilities, which partially or wholly offsets program costs.

Despite these advantages, many programs do require a public subsidy. Key funding sources for TDM programs and activities include:

- **Transportation Fund for Clean Air (TFCA):** The TFCA legislation permits BAAQMD to collect a fee (up to $4 per vehicle per year) for reducing air pollution from motor vehicles and for related planning and programs. It requires BAAQMD to allocate 40 percent of the revenue to an overall program manager(s) in each county. Alameda CTC has been designated as the overall program manager in Alameda County and has developed a program that allocates the funds as follows:
  - A maximum of 5 percent of the funds goes toward program implementation and administration;
  - Approximately 70 percent of the remaining funds goes to cities/county based on population with a minimum of $10,000 to each jurisdiction; city/county population is updated annually based on State Department of Finance estimates.
  - Approximately 30 percent of the remaining funds is allocated to transit-related projects; all

eligible applicants may apply for these funds for transit-related projects.

- **Surface Transportation Program (STP):** MTC and Alameda CTC both perform administrative functions for programming STP funds. For TDM purposes, the following projects are examples of projects eligible for STP funds: highway projects including HOV lanes, signalization, transit projects, station area and transit-oriented development planning activities that result in the location of housing and/or jobs near high-frequency transit, and bicycle and pedestrian projects.
- **Congestion Mitigation and Air Quality Program (CMAQ):** MTC and Alameda CTC both perform administrative functions for programming CMAQ funds. For TDM purposes, eligible projects include those types of transportation projects that improve air quality, such as ridesharing and bicycle and pedestrian projects.

Local Government Responsibilities and Conformance

Alameda CTC is required to monitor local jurisdictions' conformance with the adopted CMP. To meet this responsibility, Alameda CTC requires annual reporting to determine if each city and the county has adopted and implemented a trip-reduction and travel-demand ordinance.

Local Government Responsibilities

The Required Program includes actions local jurisdictions must take to comply with the CMP. Local jurisdictions have until September 1 of each year to adopt and implement the Required Program.

To be found in conformance with the CMP, local jurisdictions must certify to Alameda CTC that they have adopted and implemented site design guidelines that enhance transit and pedestrian and bicycle access. To ensure consistency among all jurisdictions, Alameda CTC established a TDM Checklist that identifies components to include in local design guidelines (Appendix G).

Local jurisdictions are also required to implement capital improvements that contribute to congestion management and reduce carbon emissions and greenhouse gases. This requirement can be satisfied by participating in the regional TFCA and the federal STP and CMAQ Programs. Refer to Chapter 8, the Capital Improvement Program (CIP) for more information on the CIP, which incorporates numerous project types and programs identified in the Transportation Control Measures (TCM) Plan (see Appendix H).

Procedures for Non-conformance

If Alameda CTC determines that a local jurisdiction has not adopted and implemented the Required Program, it may find the local jurisdiction in "non-conformance." At the time of the finding, Alameda CTC will provide recommendations for corrective actions. If after 90 days the local jurisdiction is still in non-conformance, Alameda CTC is required to follow the conformance process as identified in Chapter 9, "Program Conformance and Monitoring." This could impact the non-conforming jurisdiction's ability to receive its increment of subventions from the fuel tax made available by Proposition 111, and the jurisdiction's ability to receive funding for projects through the federal STP and CMAQ Program.

Tools for Developing a Local TDM Program

A variety of tools are available to local governments to facilitate implementing TDM programs and policies. The most effective strategies integrate several of these elements as a comprehensive package.

- **Modify zoning codes:** Local governments can implement TDM requirements through changes to their zoning code. For example, they can reduce or eliminate minimum parking requirements or grant reductions in minimum parking requirements on the condition that trip reduction programs are implemented. TDM requirements are often

implemented as a condition of approval for new development, or a city's zoning code can require certain measures to address traffic congestion and reduce greenhouse gas emissions.

- **Partner to form a Transportation Management Association (TMA):** Local governments often collaborate with business associations to facilitate creation of a TMA. Actions can include requiring TMA membership as a condition of development approval or providing staff time, office space, or start-up funding to the TMA.
- **Fund or manage programs directly:** Some local governments directly fund or manage TDM programs. For example, the local government may fund universal transit passes, carpool rides, or contract with a private organization to provide bike-sharing services.
- **Implement capital projects:** A variety of capital investments can support TDM. For example, local governments can invest in updated parking meters to facilitate smart parking management, wayfinding signage, or bicycle and pedestrian facility improvements.
- **Offer a TDM program for local government employees:** Local governments can offer trip reduction incentives directly to their employees. These steps can reduce peak-period trips while serving as a model to other employers.

Menu of TDM measures

Appendix F provides a set of tables describing TDM activities that can reduce single-occupant automobile trips in Alameda County. Table F-1 describes actions that public agencies, including local governments and transit agencies can carry out. Table F-2 describes complementary actions that local governments or private organizations such as employers or developers can carry out in response to local government requirements or on a voluntary basis.

TDM program principles

Whatever the implementing mechanism, Alameda CTC encourages local jurisdictions implementing new or expanded TDM programs and requirements to adhere to the following principles:

- **Outcome-based TDM, with specific performance targets:** Utilize performance-based strategies with specific project-level, corridor-level, or citywide targets, because these types of programs have potential to be the most effective and the easiest to implement and administer.
- **Effectiveness at achieving local and regional goals:** Invest in strategies that research has proven to be effective and to provide a good return on investment.
- **Well-balanced and thorough:** Develop a comprehensive program. The most effective TDM programs have varied and mutually supportive demand-management measures. For example, a TDM program that includes both subsidized transit passes and a guaranteed ride home program has the potential to reduce vehicle trips to a greater degree than one of those measures alone.
- **Effective marketing and public outreach:** Develop programs through open communication with all stakeholders and tailor the programs to their needs, since the manner in which TDM programs are introduced is crucial to their success. Perform marketing and public outreach to encourage participation.
- **User friendly:** Ensure TDM programs are easy for the public to understand and use. Clearly articulate policies and objectives and support them with data. Design new technologies (such as parking meters) for straightforward public usage.
- **Financially feasible and cost-effective:** Prioritize strategies that are low cost or no cost and provide the biggest return on the investment.
- **Easy and efficient to administer:** Place a priority on programs that can be easily and efficiently

administered, relying on data that is collected in the normal course of business for the city. Where possible, cities should seek to collaborate with neighboring cities to reduce administrative burdens for all.

Next Steps

Below are next steps for the CMP TDM element to increase the impact of existing TDM programs, incentivize expansion of TDM offerings throughout the county, and ultimately increase the likelihood that individuals throughout the county will travel by non-drive-alone modes.

- Further develop the Alameda CTC TDM program to leverage existing programs, projects, and funds to meet the goal of accommodating growth and to meet sustainability goals by improving transportation system efficiency and increasing travel mode options for people who travel through and within Alameda County.
- Work with local governments to identify opportunities where Alameda CTC can provide technical assistance to further local TDM strategies or projects, such as providing implementation support for the formation of new Transportation Management Associations (TMAs) or implementing parking reforms.
- Implement a focused marketing and outreach campaign that supports transit and carpooling, as well as continuing the corridor-focused TDM marketing campaigns and the I Bike campaign.
- Leverage new multimodal infrastructure improvements and cross promote regional and countywide TDM programs, such as GRH. Alameda CTC will also strengthen regional partnerships, recognizing that regional commute patterns cross jurisdictional boundaries, and consistency in messaging and programs will not only be more efficient, but will benefit Alameda County residents, employees, and employers.
- Utilize the Alameda County Technical Advisory Committee Information Exchange Forum as a vehicle for sharing TDM strategy best practices.
- Provide a robust Guaranteed Ride Home Program and continue to improve program delivery, so that it efficiently meets the needs of commuters and reduces VMT.
- Maintain and update the Commute Choices webpage (https://www.alamedactc.org/programs-projects/commute-options-and-benefits/) and transition the website to a resource center that offers TDM strategy "tool kits" to both local governments and employers.

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Land Use Analysis Program 6

Rendering of the MacArthur Transit Hub Streetscape Improvement project, Oakland

As part of the CMP, Alameda CTC must develop a program to analyze the impacts of land use decisions made by local jurisdictions on regional transportation systems. The program must generally be able to estimate the costs associated with those impacts, as well as provide credits for local public and private contributions to improve regional transportation systems.

The CMP statute does not change the role of local jurisdictions in making land use decisions or in determining the responsibilities of project proponents to mitigate possible negative effects of projects. However, Alameda CTC has the ability to apply certain sanctions, as described in Chapter 9, "Program Conformance and Monitoring," if the local agency does not comply with the requirements of the law.

California Environmental Quality Act (CEQA) guidelines related to transportation impact analysis, amended in 2018, changed the significance metric from the delay-based LOS to vehicle miles traveled (VMT). This new metric becomes mandatory on July 1, 2020.

Since CMP legislation requires that LOS is used as the primary performance metric, it is in direct conflict with SB 743. There were efforts to amend the CMP legislation, prior to the CEQA guidelines update, to align with the intent of SB 743 but failed. However, given that the new CEQA traffic impact analysis significance metric will be mandatory on July 1, 2020, the CMP legislation is anticipated to be amended in the next two years, most likely prior to the next CMP update cycle. Further, Alameda CTC is working with the regional agencies and jurisdictions within the county to develop consistent countywide guidelines to implement SB 743 requirements for CEQA purposes. Until the CMP legislation amendment occurs, any major update to the CMP or one of the five required elements will not be productive. Therefore, Alameda CTC only made focused changes during this update to the "Land Use Analysis Program" chapter.

The intent of the Land Use Analysis Program is to:

- Coordinate local land use and regional transportation investment decisions;
- Assess the impacts of development in one community on another community; and
- Promote information sharing between local governments when the decisions made by one jurisdiction will impact another.

The Land Use Analysis Program works best when Alameda CTC is involved at the very early stages of the development process, maximizing intergovernmental contacts before major decisions are complete. The process is intended to work in a positive, cooperative fashion that supports the needs of local, county, regional, and state governments. Proactive responses to potential impacts can occur during environmental

review of specific land developments, corridor, or area-wide studies, and preparation of local or regional Capital Improvement Programs.

Since the passage of the CMP legislation in 1991, a variety of other state and regional legislative, policy, and regulatory actions (See Table 6.1) have strengthened the need for a Land Use Analysis Program. These policies share the common theme that they coordinate transportation planning and investment decisions with existing and future land use patterns.

Table 6.1—Legislative and Regulatory Actions

Legislation/Regulatory Policy Action	Description
California Assembly Bill 32 (AB 32)	The California Global Warming Solutions Act of 2006 requires the State of California to meet aggressive greenhouse gas emissions reduction targets.
California Senate Bill 375 (SB 375)	This 2008 bill, Redesigning Communities to Reduce Greenhouse Gases, synchronizes long-range regional transportation and land use planning and requires regional preparation of a Sustainable Communities Strategy (SCS) that details how a region will house its population.
Metropolitan Transportation Commission (MTC) Resolution 4035	This resolution establishes the One Bay Area Grant Program, which links federal transportation funding to locations in or with proximate access to locally designated Priority Development Areas.
MTC Resolution 3434	The Transit Oriented Development (TOD) Policy for Regional Transit Expansion Projects of 2005 links the expenditure of regional capital funding for transit expansion to the density of households allowed around future mass transit systems.
MTC Priority Development Areas	Priority Development Areas are areas identified by the local jurisdictions for focused future growth. MTC ties One Bay Area grants using federal funds to transportation improvements to these PDAs which is also intended to advancing the Bay Area's land use and housing goals.
Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Guidelines	These 2010 guidelines set low thresholds of significance for acceptable exposure to toxic air contaminants for residents and other users of new developments.
San Francisco Bay Conservation and Development Commission (BCDC) Sea Level Rise Estimates	These estimates identify many key development areas and transportation assets as being vulnerable to sea-level rise and needing adaption planning.

While Alameda CTC's Land Use Analysis Program was initially conceived as a program to meet the CMP legislative mandate, the growing focus at all levels of government on improved coordination between land use and transportation planning has resulted in the program's evolution. The program now also serves as an opportunity for strategic thinking about how to plan for development that efficiently uses the transportation system, while ensuring that the mobility and access needs of residents and workers in Alameda County are fulfilled. In this context, the program includes:

- Legislatively required review of land use actions of local jurisdictions by Alameda CTC to ensure that impacts on the regional transportation system are disclosed and mitigation measures are identified;

- Land use projections from the Regional Planning Agency for use in countywide model database by local jurisdictions;
- Planning initiatives and programs that foster transportation and land use connections; and
- Strategic monitoring of transportation-land use coordination performance measures.

Review of Land Use Actions

A major component of the Alameda CTC Land Use Analysis Program is the legislatively required review of land use development projects. The review of development projects allows Alameda CTC to assess impacts of individual development actions on the regional transportation system and ensures that significant impacts are appropriately mitigated.

Alameda CTC also plays a key interjurisdictional facilitation role, and when disputes arise between two agencies as a result of the potential impacts of a land use project, Alameda CTC may act as a mediator, if requested by one of the parties involved.

Scope of Review

Alameda CTC reviews two types of land use actions if the proposed land use development exceeds the adopted trip-generation threshold:[14]

- **Projects requiring General Plan Amendments:** These projects require a change to the text or map of a city or unincorporated planning area's General Plan. General Plan Amendments (GPAs) can be performed in conjunction with a General Plan update, a specific plan, or an area plan. GPAs can also be adopted for an individual development project that is not consistent with current land use designations and therefore requires a GPA.
- **Projects consistent with General Plan:** These plans or projects do not require any modification of the General Plan text or map.

Alameda CTC limits the scope of its review of land use actions to those plans and projects with the potential to cause countywide or regional-scale impacts. Projects are reviewed if they will cause a net increase of 100 p.m. peak-hour vehicle trips or more. Alameda CTC uses the p.m. peak period, because it generally experiences the highest daily travel demands. This threshold is applied differently, depending on whether a project requires a GPA or is consistent with an existing General Plan. Mitigated Negative Declarations (MNDs) are also considered differently, depending on whether a GPA is required or not. Table 6.2 summarizes the application of the 100 p.m. peak-hour trip threshold and consideration of MNDs.

Table 6.2—CMP Land Use Analysis Project Review

	Project Requiring General Plan Amendment	Project Consistent with General Plan
100 P.M. Peak-hour Trip Threshold Assessed Relative to:	Existing General Plan land use designation(s)	Existing use(s) at project site
Mitigated Negative Declarations	Considered (if trip generation threshold exceeded)	Not considered

[14] Previous versions of Alameda CTC CMPs referred to Plans and Development Projects as Tier 1A and Tier 1B. The "Tier" nomenclature has been discontinued to avoid confusion with the Tiers of the CMP network arterials.

Alameda CTC performs project trip generation calculations to determine whether CMP Land Use Analysis Program review is required. Project trip generation is computed using an approved trip generation methodology (see the following

"Methodologies and Standards" section). The threshold for CMP review is based on net change in vehicle trips, meaning that trips from reclassified uses or existing buildings being redeveloped are subtracted out of the total.

Alameda CTC reviews all large development projects for which a city or Alameda County is the lead agency.[15] Alameda CTC may also review large development projects from institutions, federal agencies, or neighboring counties if these are likely to impact the regional transportation system in Alameda County.

Review Process

Consistent with the CMP statute, Alameda CTC's review of plans and development projects through its Land Use Analysis Program is designed to occur alongside the CEQA review process to avoid duplication of effort. Alameda CTC strives to perform its review on the same timeline to offer early and proactive input that can aid and refine project design. Figure 6.1 illustrates the typical review process.

Once Alameda CTC receives a GPA or Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR), it issues a response within 30 days. This response either indicates that the project is exempt from CMP Land Use Analysis Program review (if it does not exceed the 100 p.m. peak-hour vehicle trip threshold) or provides comments on the scope of analysis to be performed in the DEIR to satisfy CMP requirements. If a project is not exempt, then once Alameda CTC receives a DEIR, it issues a response within 45 days. This response either indicates that the analysis contained within the DEIR adequately addresses CMP requirements or provides comments on changes or additional analysis needed to adequately address CMP requirements.

A project is considered complete from a CMP review perspective once Alameda CTC notifies the project sponsor that the project is exempt or once Alameda CTC notifies the project sponsor that CMP requirements have been met and that it has no further comments on the project.

Use of the Alameda Countywide Travel Demand Model

The CMP statute assigns responsibility to CMAs to develop a travel demand model "that will be used by local jurisdictions to determine the quantitative impacts of development on the circulation system." The Alameda Countywide Travel Demand Model is typically used to determine traffic volumes, transit ridership, and other information for future years. Jurisdictions are required to use the most current version of the Alameda Countywide Travel Demand Model for the CMP Land Use Analysis Program. Alameda CTC amended the CMP requirements in 1998, so that local jurisdictions are responsible for applying the travel model. All local jurisdictions have signed Master Use Agreements with Alameda CTC that outline the procedure for requesting the model for a specific application.

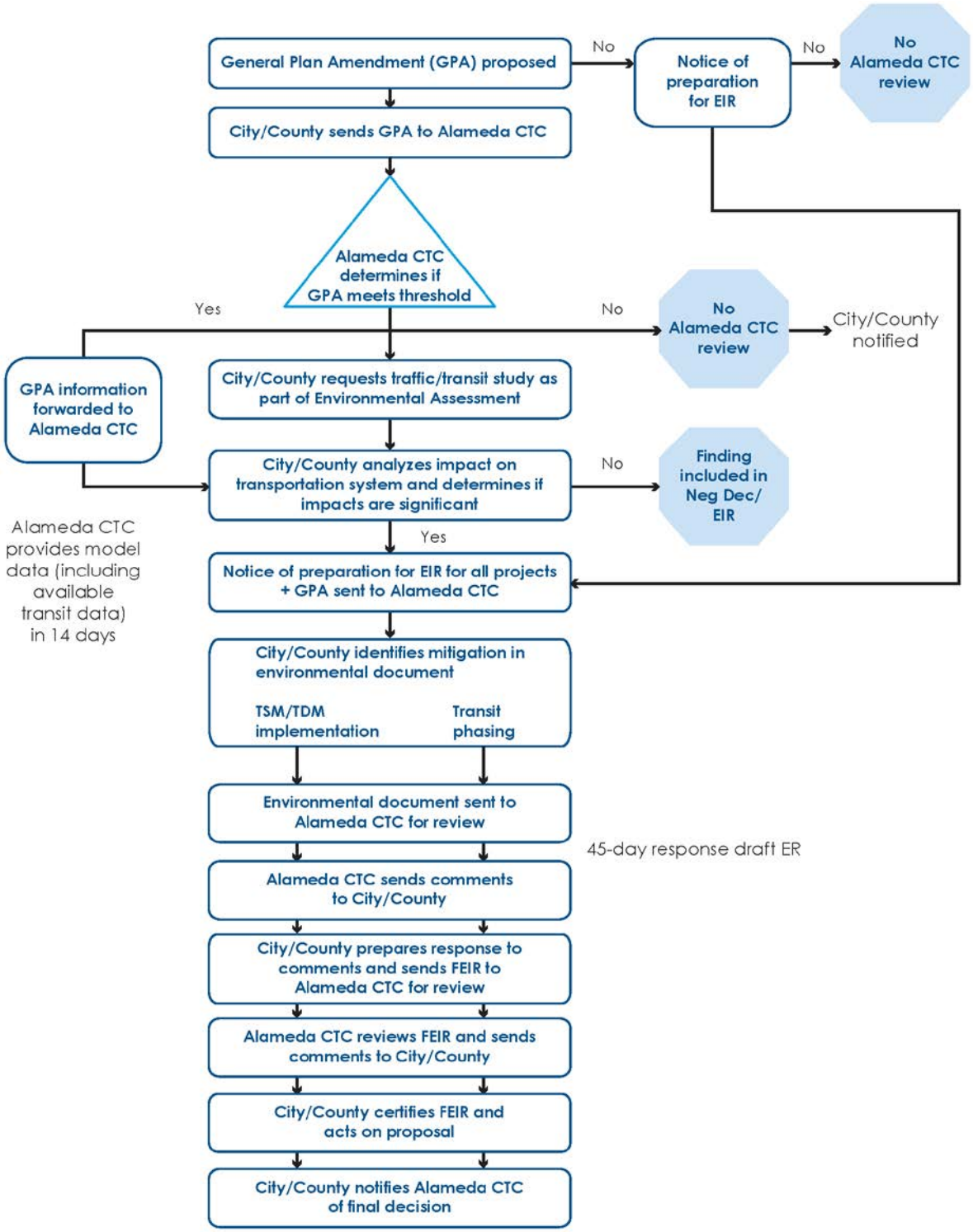
Per the CMP statute, jurisdictions may also use an approved subarea travel demand model. Alameda CTC has responsibility for approving subarea models based on whether these models demonstrate adequate consistency with the countywide model. Appendix I describes Alameda CTC's policy on subarea models and required documentation for approval.

Methodologies and Standards

Project sponsors should use the following methodologies and standards when conducting Transportation Impact Analyses for the CMP Land Use Analysis Program. Guidance on methodologies and standards may also be given as part of Alameda CTC's GPA or NOP response to the particular project.

[15] For purposes of compliance with the Land Use Analysis Program, the Port of Oakland is considered a governmental subdivision of the City of Oakland. Therefore, the Port is required to submit environmental documents to Alameda CTC for review and comment.

Figure 6.1—CMP Land Use Analysis Program Project Review Process



Transportation networks

The CMP statute requires analysis of impacts of land use actions on regional transportation systems. For Alameda CTC's CMP analyses, "regional transportation systems" is interpreted as follows:

- **Autos:** Study impacts to roadway segments on the 2002 Metropolitan Transportation System (MTS);[16]
- **Transit:** Study impacts to MTS transit operators (ACE, AC Transit, BART, Capitol Corridor, LAVTA, Union City Transit, and WETA);
- **Bicycles:** Study impacts to cyclists on facilities of countywide significance, defined in the Countywide Active Transportation Plan; and
- **Pedestrians:** Study impacts to pedestrians within the areas of countywide significance defined in the Countywide Active Transportation Plan.

The broader definition of regional transportation systems encourages early identification of impacts on a larger system of roadways and explicitly includes transit, bicycle, and pedestrian system impacts.

Trip generation estimates

Alameda CTC conducts a trip-generation calculation to estimate how many new trips will be on the transportation network due to a development project or plan. Project trip generation is used to determine whether a project meets the threshold for CMP review and to assess impacts on the transportation system.

The Institute of Transportation Engineers Trip Generation Manual is an acceptable method for estimating project trip generation. This methodology, which works by relating a variable describing the size of the project (e.g., square feet, number of units, number of gas pumps, etc.) to trips generated, is an established methodology widely used for CMP and other purposes in the transportation industry.

In addition, three trip generation methodologies designed to capture trip-making characteristics in dense or transit-rich areas such as infill development sites are acceptable to apply in Alameda County for CMP analyses. Project sponsors have the option of using one of the following adopted alternative trip generation methodologies (or others, if the EIR justifies why it is being used):

- EPA's Mixed-use Development (MXD) model
- Caltrans/UC Davis Smart Growth Trip Generation rates
- MTC's Station Area Residents Study (STARS) mode-share adjustment method (household travel survey-based adjustments)

Appendix J contains guidance on how to apply the rate adjustments.

Projects in areas with travel demand management (TDM) programs may also experience lower vehicle trip generation, as these programs provide information, incentives/disincentives, and other mechanisms to shift auto trips to other modes, times of day, or closer destinations. Project sponsors may adjust trip-generation estimates to reflect the presence of TDM programs. The TDM element of the Alameda CTC CMP contains a menu of TDM programs (see Appendix G) with research-based expected ranges of trip reduction benefits that project analysts may use to adjust trip-generation estimates. Assumptions should be clearly documented and justified.

[16] With the passage of the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, MTC was required to develop an MTS that included both transit and highways. MTC contracted with the CMAs in the Bay Area to develop the MTS and to use the CMPs to link land use decisions to the MTS. Therefore, a distinction is made between the CMP network, which is used for monitoring conformance with LOS standards, and the MTS, which is used for the Land Use Analysis Program. In 2005, MTC updated the MTS to include Rural Major Collector classified streets and higher classifications based on the Federal Functional Classification System. MTC uses the updated MTS for the purposes of funding and programming as well as in estimating roadway maintenance needs. The Alameda County Technical Advisory Committee reviewed the updated MTS during the 2009 CMP update to determine its usefulness and applicability to the Land Use Analysis Program. Based on input from local jurisdictions and discussion with MTC, Alameda CTC determined that the updated MTS was not appropriate for the Land Use Analysis Program, because it was too detailed for planning purposes, and the previous version of the MTS would continue to be used.

Types of impacts and impact assessment methodologies

Project sponsors should consider impacts to all modes as described below. Appendix J provides full information on impact types and impact assessment methodologies.

- **Autos:** Vehicle delay using the HCM2010 methodology (or HCM2000 methodology, if required for consistency with local requirements) and consistency with adopted plans;
- **Transit:** Effects of vehicle traffic on mixed-flow transit, transit capacity, transit access/egress, need for future transit service, consistency with adopted plans, and Circulation Element needs;
- **Bicycles:** Effects of vehicle traffic on bicyclists conditions, site development, and roadway improvements, and consistency with adopted plans;
- **Pedestrians:** Effects of vehicle traffic on pedestrian conditions, site development, and roadway improvements, and consistency with adopted plans; and
- **Other impacts and opportunities:** Noise impacts for projects near state highway facilities and opportunities to clear access improvements for transit oriented development projects.

Thresholds of significance

Alameda CTC has not adopted thresholds of significance for CMP land use analysis purposes.[17] Project sponsors should use professional judgment to 1) define a threshold that is appropriate for the project context; and 2) use this threshold to determine if segments are impacted.

Mitigation measures

Roles of Alameda CTC vs. local jurisdictions

The CMP statute requires that a Land Use Analysis Program assess the costs of mitigating impacts to the regional transportation system from local land use decisions. This authority must be balanced with the responsibility that local governments hold in the development review process under CEQA. Local governments have lead agency responsibility for preparing EIRs including transportation impact analysis. In addition, the decision of whether to implement a mitigation measure or to adopt a statement of overriding considerations is a local decision.

Alameda CTC's role is to provide comments through the EIR process on the adequacy of analysis. Alameda CTC has authority under the CMP statute to require disclosure of impacts and mitigation measures, and to require local agencies to establish a program for securing funding to mitigate transportation impacts of land use decisions. The CMP statute does not grant Alameda CTC authority to require implementation of a mitigation measure.

Adequacy of mitigation measures

Inadequate and/or underfunded transportation mitigation measures may have significant implications for the regional transportation system. Either might result in failure to meet LOS standards, triggering potential non-conformance and the need for a deficiency plan. Furthermore, an environmental document may rely on state or federal funding of mitigation measures. Such funding may not be consistent with Alameda CTC's project funding priorities.

Alameda CTC's policy regarding mitigation measures is that to be considered adequate they must be:

- Sufficient to sustain CMP roadway and transit service standards;
- Fully funded; and
- Consistent with project funding priorities established in the Capital Improvement Program of the CMP, the Countywide Transportation Plan, and the Regional Transportation Plan (RTP) or the federal

[17] Note that the LOS E threshold used to determine deficiency as part of the LOS monitoring CMP element does not apply to the Land Use Analysis Program. This threshold is used for biennial monitoring, not to determine whether impacts will be caused over the long term by an individual land use action.

Transportation Improvement Program, if the agency relies on state or federal funds programmed by Alameda CTC.

Types of mitigations

A project can propose mitigation measures of several types to address CMP impacts, including but not limited to:

- **Transportation network changes** including changes to roadway geometry (e.g., adding lanes, adding turn pockets, adding mid-block crossings) and intersection control (e.g., adding stop control or signalizing an intersection).
- **Transportation demand management measures and programs** including amenities, information, incentives, and disincentives designed to influence demand for peak-hour auto trip-making. The TDM element of the Alameda County CMP contains a menu of TDM programs (see Appendix G) with research-based expected ranges of trip reduction benefits that project analysts may use to estimate the effectiveness of TDM mitigation measures.
- **In lieu mitigations** including implementing a part of an Areawide Deficiency Plan or paying into a Transportation Impact Fee program.

In the case of smaller projects, local governments may wish to require project proponents to enter an agreement to provide a "fair share" portion for mitigating a cumulative impact. This addresses the legislative requirement that the CMP must be able to estimate costs associated with mitigating transportation impacts.

Multimodal tradeoffs

In certain settings, mitigation measures designed to resolve an impact to one mode may cause undesirable secondary impacts to other modes. These secondary impacts may be contrary to adopted policy objectives. A typical example is adding a turn pocket at an intersection, to address an auto circulation impact in a downtown or infill development area, which may increase crossing distances and exposure to vehicles for cyclists, pedestrians, and transit riders.

Jurisdictions are encouraged to discuss multimodal tradeoffs associated with mitigation measures that involve changes in roadway geometry, intersection control, or other changes of the transportation network. This analysis should identify whether the mitigation will result in an improvement, degradation, or no change in conditions for automobiles, transit, bicyclists, and pedestrians. The HCM2010 multimodal level of service methodology is encouraged as a tool to evaluate these tradeoffs, but project sponsors may use other methodologies as appropriate for particular contexts or types of mitigations.

Review of Land Use Projections[18]

Alameda CTC has responsibility for developing a database of housing and job growth projections utilized in the Alameda Countywide Travel Demand Model (more detail on the countywide model is available in Chapter 7). The CMP statute prescribes that this land use database must be consistent with the regional land use database and assumptions of the regional travel demand model. The Association of Bay Area Governments (ABAG) develops the regional land use database for the nine-county Bay Area. This database, now referred to as the Sustainable Communities Strategy (formerly referred to as the Projections series), part of the *Plan Bay Area* series, includes numbers of households and jobs by sector for existing and future planning horizon years. Alameda CTC works with local jurisdictions to develop the countywide database by allocating ABAG's housing and job projections to a refined-scale zone system for countywide model traffic analysis. For this reallocation to be deemed "consistent" in the sense of the CMP statute, the county-level totals

[18] The review of housing and job projections was referred to as Tier 2 review in previous versions of the Alameda CTC CMP. This nomenclature has been eliminated to avoid confusion with the tiers of the CMP arterial network.

from the two allocations must be within plus or minus one percent, per MTC's established guidelines as described in Chapter 9.

Alameda CTC's land use database development process typically happens as part of a Countywide Travel Demand Model update. During this process, local jurisdictions are required to review a draft allocation of ABAG totals to the Countywide Travel Demand Model transportation analysis zones (TAZs). Local jurisdictions then have 60 days to provide input on this draft allocation.

Alameda CTC completed work to incorporate ABAG projections adopted as part of Plan Bay Area, the region's RTP and Sustainable Communities Strategy (SCS), into the Alameda Countywide Travel Demand Model in June 2014. MTC adopted the updated *Plan Bay Area*, Plan Bay Area 2040, in July 2017. This adoption triggered the Alameda CTC's process of updating the Countywide Travel Demand Model to be consistent with the most recent adopted land use projections.

Fostering Transportation Land Use Connection

Alameda CTC oversees a variety of programs and planning activities that strengthen connections between transportation and land use.

SB 375 and Sustainable Communities Strategy

Climate change awareness and the urgency to reduce greenhouse gases has become a driving force in the transportation realm. Adopted in 2008, SB 375 mandates an integrated regional land use and transportation-planning approach to achieve targets for reducing greenhouse gas emissions from automobiles/light trucks. The focus of SB 375 is on reducing vehicle miles traveled (VMT) and reducing GHG emissions by 7 percent by 2020 and 15 percent by 2035.

To comply with SB 375, MTC and ABAG began development of Plan Bay Area, a joint planning process that includes the RTP and the SCS land use plan. The SCS component of *Plan Bay Area* is designed to:

- Lay out how development patterns and the transportation network can be integrated to help reduce greenhouse gas emissions;
- Identify how the region's housing needs will be met;
- Improve modeling of land use and transportation; and
- Be congruent with local general plans, specific plans, and zoning.

The first Plan Bay Area was adopted in July 2013, and updated as Plan Bay Area 2040 in July 2017. A subsequent update called Plan Bay Area 2050 is currently underway. The SCS component of both Plan Bay Area versions focus on promoting 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. Through the Plan Bay Area series, the region simultaneously addresses its long-range transportation planning and strategy for meeting its Regional Housing Needs Allocation (RHNA), in anticipation that the synchronization of these planning tasks will result in better transportation-land use coordination.

A key feature of the SCS is the designation of Priority Development Areas (PDAs), which are locally-nominated areas near planned or existing transit designed to accommodate significant housing and job growth over the life of Plan Bay Area. In PBA 2040, PDAs represent less than 3 percent of the land area in the Bay Area but are projected to take on 77 percent and 55 percent of housing and jobs, respectively. If successful, Plan Bay Area will give people more transportation choices, create more livable communities, and reduce the emissions that cause climate change.

Alameda CTC closely participates in development of the Plan Bay Area series in many ways including through its CTP update process. Alameda CTC works to ensure that the land use scenarios in PBA series balances state mandates, regional planning objectives, local preferences, and market realities.

Priority Development Area Investment and Growth Strategy

PDAs are designated infill sites where greater housing and commercial density can be accommodated near transit stops. PDAs were originally identified by local governments as part of the Focusing Our Vision (FOCUS) program, a regional development and conservation strategy led by ABAG and MTC in partnership with the BAAQMD and BCDC that was adopted in 2007, which promoted a more compact land use pattern for the Bay Area. The FOCUS program subsequently became the basis for the region's current SCS.

Currently in Alameda County, 46 PDAs have been voluntarily nominated by local jurisdictions and approved by ABAG as part of Plan Bay Area 2040. These PDAs represent a wide range of place types and land use contexts. The FOCUS process also identified Priority Conservation Areas (PCAs), which are regionally significant open spaces for which there exists a broad consensus for long-term protection but nearer-term development pressure. PDAs and PCAs complement one another because promoting development within PDAs takes development pressure off the region's open spaces and agricultural lands.

PDA development is supported by the One Bay Area Grant (OBAG) program adopted by MTC and ABAG. MTC adopted the funding and policy framework for the second round of the One Bay Area Grant program (OBAG 2) as Resolution 4202, last revised December 2016. MTC Resolution 4202 provides guidance for the allocation of federal Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funding. With the first OBAG funding cycle (OBAG 1), MTC implemented a new approach that integrated the region's federal transportation funding program with the Bay Area's first Sustainable Communities Strategy (required under Senate Bill 375, Steinberg, 2008), which integrates land use and transportation planning activities with the goal of reducing vehicle miles traveled. In large counties, such as Alameda County, a minimum of 70 percent of OBAG 2 funding must be programmed to transportation projects or programs that support PDAs.

Alameda CTC has developed a Priority Development Area Growth and Investment Strategy in alignment with regional mandates that provides an overview of PDAs and PCAs in Alameda County, establishes a transportation project priority setting process for funding that supports and encourages development in the county's PDAs, and provides additional policy background on integration of land use and transportation.[19] The most recent Alameda County PDA Investment and Growth Strategy was adopted in May 2017.

Regarding PCAs, considering that the eastern part of the county is rural, based on the recommendations made during the prior CMP update Alameda CTC will continue to work with MTC and ABAG to identify ways to support improvements to rural roadways that facilitate agricultural operations and agricultural tourism in East County and to develop a more comprehensive approach to mitigating impacts from rural roadway improvements and efforts that support PCA goals and objectives.

Areawide Transportation Impact Mitigation Fees

An areawide transportation impact fee and/or revenue measure such as establishing an assessment district could generate funds necessary to plan and implement transportation mitigation measures related to land development. Transportation impact fees are addressed in the CMP statute as a proactive method of addressing

[19] Alameda CTC PDA Investment and Growth Strategy: http://www.alamedactc.org/app_pages/view/10385

transportation needs arising from land development. Also, the passage of Senate Bill 743 in September 2013 heightened the importance of an areawide transportation impact fee, generally.

At present, Alameda CTC and most local jurisdictions in Alameda County review development projects and determine required mitigation measures on a project-by-project basis. If found to be feasible, a transportation impact fee could be designed to supplement the current project-by-project review, in which case the fee would raise additional revenue to fund multi-jurisdictional mitigations. Another option is that a transportation impact fee could be designed to replace the project-by-project review. In this case, the fee would be designed to generate revenues to fund both localized and multi-jurisdictional mitigations.

Alameda CTC conducted feasibility studies in 1997 and 2007 for a countywide traffic mitigation fee. These feasibility studies investigated a fee that would supplement the project review and mitigations required by local jurisdictions. These previous studies recommended that Alameda CTC not proceed with an areawide traffic impact fee due to concerns about discouraging development, particularly in urban areas where redevelopment projects already face higher costs than in suburban areas.

Parking Standards and Policies

Parking for automobiles is a significant but under-recognized factor in the relationship between land use and transportation. It has been customary for local jurisdictions to require development projects to provide a minimum number of parking spaces. Moreover, most parking is underpriced. These two factors encourage driving, leading to inefficient land use and more congestion.

As part of its Sustainable Communities Technical Assistance Program (SC-TAP), Alameda CTC funded parking management studies in the cities of Albany and San Leandro. Several other cities have completed locally funded parking management studies. In addition, several Alameda County jurisdictions have implemented flexible- and demand-based parking strategies (e.g., Berkeley's GoBerkeley program and Oakland's Montclair Parking District) which seek to raise or lower parking prices according to demand for the spaces, thereby achieving high utilization of a scarce asset.

Land Use and Regional Transit Funding Priority

The Regional Transit Expansion Program, originally adopted by MTC in 2001 as Resolution 3434 and updated as part of Plan Bay Area in 2013 and PBA 2040, identifies the regional commitment to transit investments in the Bay Area. Resolution 3434 identified $18 billion in transit expansion investment projects. It includes a TOD policy to condition transit expansion projects funded under Resolution 3434 on supportive land use policies. The regional TOD policy has three key elements:

1. Corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors;
2. Local station area plans that address future land use changes, station access needs, circulation improvements, pedestrian-friendly design, and other key features of TODs; and
3. Corridor working groups that bring together CMAs, city and county planning staff, transit agencies, and other key stakeholders to define expectations, timelines, roles, and responsibilities for key stages of the transit project development process.

Alameda CTC worked with local jurisdictions, transit providers, congestion management agencies in adjoining counties, ABAG, and MTC to address the TOD policy in regional corridors. Many of the Resolution 3434 projects in Alameda County and in the region are being

implemented or completed. The completed projects in Alameda County are listed below.

- BART Oakland Airport Connector
- BART Warm Springs Extension

As part of PBA 2040, the region's $660 million in federal New and Small Starts funding will be directed to enhance transit service in the East Bay and North Bay counties in addition to funding AC Transit's San Pablo BRT project. PBA 2040 also determined that all future priorities are subject to an assessment of feasible alternatives and an evaluation of cost-effectiveness and performance against MTC's TOD Policy.

Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP. While Alameda CTC does not have the authority to approve or deny local land use projects, it may find the local jurisdiction in non-conformance. If it fails to comply with the requirements of the land use analysis program, a jurisdiction risks losing Proposition 111 gas tax subvention funds. The detailed process for non-conformance findings and the resulting withholding of funds is described in Chapter 9.

In some cases, Alameda CTC may find that additional mitigation measures are necessary to prevent certain segments of the CMP network from deteriorating below the established LOS standards, before a conformance finding is made. In such cases, Alameda CTC will require the local jurisdiction to determine whether the additional mitigation measures will be undertaken as a condition of project approval, or whether they will be implemented as part of a deficiency plan for the CMP network segments affected.

Local jurisdictions have the following specific responsibilities under the Alameda CTC Land Use Analysis Program.

Throughout the year

Local jurisdictions are required to do the following to ensure conformity with the CMP Land Use Analysis Program requirements:

- Forward to Alameda CTC all notices of preparation, draft and final Environmental Impact Reports and Environmental Impact Statements, and final dispositions of General Plan amendment and development requests.
- Analyze large development projects according to the guidelines in this chapter, including the use of the Alameda Countywide Travel Demand Model or an approved subarea model and disclosure of impacts to the MTS, if Alameda CTC determines the project exceeds the threshold for which CMP review is required.
- Work with Alameda CTC on the mitigation of development impacts on the regional transportation system.

During annual conformity findings process

Local jurisdictions are required to do the following to ensure conformity with the CMP Land Use Analysis Program requirements during the annual conformity findings process with occurs from September to November:

- Demonstrate to Alameda CTC that the Land Use Analysis Program is being carried out.

Provide Alameda CTC with:

- A list of land use development projects approved during the previous fiscal year; and

As needed according to Alameda Countywide Travel Demand Model development schedule

During travel model updates, provide an update (prepared by the jurisdiction's planning department) of the anticipated land use changes likely to occur using MTC/ABAG's most recent forecast for a near-term and far-term horizon year. This land use information should be provided in a format compatible with the Countywide Travel Demand Model.

Next Steps

The following are next-step items for the CMP Land Use Analysis Program to strengthen the connection between land use and transportation.

- Monitor potential updates to CMP legislation and revise the Land Use Analysis Program to align with the new requirements while keeping it an effective tool to monitor the impact of land use development on the countywide multimodal transportation system.
- Complete the countywide guidelines to implement SB 743 that supports all jurisdictions and Alameda CTC and identifies an approach to harmonize the CMP in the SB 743 context until the CMP legislation is amended.
- In view of the significant implications of the above legislative actions on the CMP as a whole, particularly the Land Use Analysis Program, until the legislative actions are finalized, the following next steps identified in prior updates of the CMP, which are still important, can be postponed, so they can be realigned with the potential legislative outcomes.
    - Develop a policy regarding tiering off of CMP analysis conducted as part of a specific plan or other area plan, if that analysis was conducted using a version of the Alameda Countywide Travel Demand Model that is no longer the most current version.

Additionally, the CMP will continue to pursue the following depending on available resources:

- Identify ways to address rural roadway improvement needs and efforts that support PCA goals.
- Consider establishing a means for projects that impact long travel corridors and traverse multiple jurisdictions within Alameda County to contribute their fair share of required mitigation measures throughout the corridor.
- Explore development of partnerships for sharing the costs for implementing related mitigation measures for congested cross-county corridors.
- Explore establishing cross-county partnerships with adjacent counties to develop mutually agreeable strategies for cross-county-corridor improvements.

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Database and Travel Demand Model

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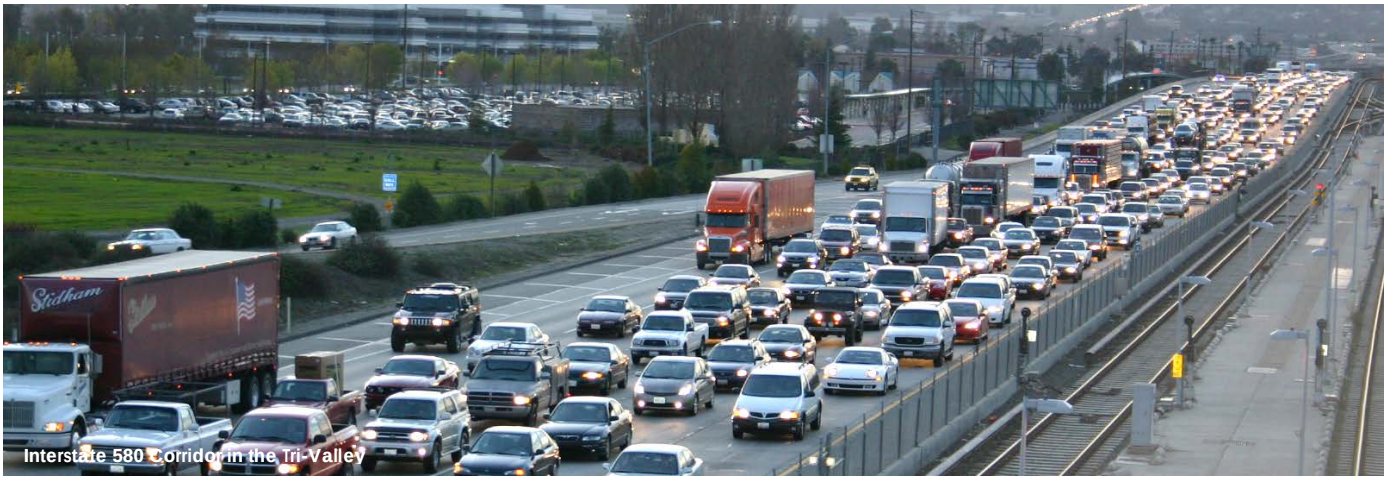

Interstate 580 Corridor in the Tri-Valley

The CMP legislation requires every CMA, in consultation with the regional transportation planning agency (the Metropolitan Transportation Commission (MTC) in the Bay Area), cities, and the county, to develop a uniform database on traffic impacts for use in a countywide travel demand model.[20] Further, the legislation mandates the countywide model to be consistent with the assumptions of the regional travel demand model developed by MTC and the most current land use and socioeconomic database adopted by the Association of Bay Area Governments (ABAG) for Alameda County. In its role as the CMA, Alameda CTC must approve computer models used for sub-areas, including models used by local jurisdictions for land use impact analysis. All models must be consistent with the countywide model and standardized modeling assumptions.

The purpose of this requirement is to bring a uniform technical basis for analysis to congestion management decisions. This includes consideration of the benefits of transit service and travel demand management (TDM) programs, as well as projects that reduce congestion on the CMP network. The modeling requirement is also intended to assist local agencies in assessing the impacts of new development on the transportation system.

Use of the Alameda Countywide Travel Demand Model is essential for the CMP planning process. The Alameda County CMP is a forward-looking program, promoting a philosophy of early action to prevent conditions from deteriorating. The countywide model allows Alameda CTC to anticipate and forecast the potential impacts of local land development decisions on the Metropolitan Transportation System network.

2018 Countywide Travel Demand Model Features

Alameda CTC updated its Countywide Travel Demand Model in 2018 to be consistent with the most recently adopted Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which is called Plan Bay Area 2040. This was a minor update to the model, focusing mostly on updating the sociodemographic data and the projects that are included in the network to reflect those in Plan Bay Area 2040. The last major model update for the countywide model was in 2014.

The 2018 model includes the following key features:

- It uses Cube software and is a trip-based model.
- The base year of the model is 2010, and the future years are 2020 and 2040.

[20] California Government Code Section 65089(c).

- Five time periods are included in the model: a.m. peak 1-hour (7:30-8:30 a.m.); p.m. peak 1-hour (4:30-5:30 p.m.); a.m. peak 4-hour (6:00-10:00 a.m.); p.m. peak 4-hour (3:00-7:00 p.m.); and daily. This updated model has 1,580 traffic analysis zones (TAZs) in Alameda County 1,256 TAZs outside of Alameda County, and 31 gateway zones.
- The 2018 model has a refined traffic analysis zone (TAZ) system in Alameda County and in the immediately adjacent sections of Santa Clara and Contra Costa Counties. The model uses MTC's regional TAZ system in the remaining six Bay Area counties and includes an aggregated TAZ system for San Joaquin County.
- The 2018 model continues to use base year 2000 calibration and 2010 validation. Validation data include traffic counts, transit ridership, and bicycle counts.
- The Alameda CTC model assumes all projects included in the 2040 horizon year of Plan Bay Area 2040. Further, the model roadway network includes additional detail in Alameda County and in adjacent parts of Santa Clara and Contra Costa counties. The model also includes stop, station, and route detail in the transit network for Alameda County and maintains the MTC roadway and transit networks in the remaining Bay Area counties.
- Alameda CTC socioeconomic data inputs are consistent with Plan Bay Area 2040. Data at the MTC zone level in Alameda was allocated to the smaller Alameda CTC model zones using local land use development patterns, working within the constraint of 1 percent deviation from the reginal plan control totals for the county. Alameda CTC also incorporated the updated San Joaquin County land use dataset developed as a part of the San Joaquin Council of Governments Transportation Regional Plan 2014.

Documentation of specific features and assumptions for various components of the 2018 model are available on the Alameda CTC website.

Land Use Database Development

The database included in the 2018 countywide travel model is based on Plan Bay Area 2040 employment, population, and household projections at the MTC model TAZ level (RTAZ).

The process of developing the land use and socioeconomic database for the countywide model is to first allocate land use and socioeconomic data from MTC's regional TAZs to Alameda CTC's smaller model TAZs for review and redistribution by Alameda County jurisdictions. The jurisdictions' totals are requested to stay within a 1 percent variation from the Plan Bay Area 2040 totals, but they are permitted to redistribute them if appropriate. Countywide totals after redistribution remain within plus or minus 1 percent of Plan Bay Area 2040 county totals, as required by MTC.

Model Development

The framework established for the model encompasses the following components:

- Trip generation (number of trips forecast by traffic analysis zone);
- Trip distribution (distribution of forecast trips between each traffic analysis zone);
- Modal split of inter-zonal trips (distribution of trips by mode within each traffic analysis zone); and
- Assignment (forecast of trips originating in or destined to external zones).

These are typical model components found in any model that produces simulations of travel demand, based on different assumptions about land use and demographic and transportation characteristics.

The countywide model was developed using Citilabs' Cube software, which is an interactive transportation planning program that produces numerical and graphic representations of travel supply and demand. The model is structured to provide forecasting detail that adequately addresses the evaluation needs of both countywide and corridor-specific transportation

strategies. The countywide model has been developed and validated by:

- Defining a TAZ structure detailed enough to depict changes in land use and demographics that would affect travel demand on arterials and intra-county transit systems; and
- Establishing highways and transit networks detailed enough for those types of travel demand.

Development and validation of the model were based on the following concepts:

- Consistency with the assumptions and procedures established and used by MTC to produce regional travel demand forecasts. Specifically, the model maintains the same variables in the equations that comprise the trip-generation, trip-distribution, and mode-split components of MTC's previous travel demand model framework based on the MTC BAYCAST-90 model.
- Where necessary (to produce validated forecasts of travel on arterials or intra-county transit services), enhance the capacity of MTC's models by incorporating the simulation of certain types of travel not modeled by MTC. Specifically, this includes the addition of new transit sub modes.

The 2018 model incorporates land use and demographics of ten counties: the nine-county Bay Area and San Joaquin County. This allows the model to produce travel demand forecasts that incorporate influences of regional travel demand on transportation facilities in Alameda County. Travel originating or terminating outside the nine-county Bay Area and San Joaquin County is also taken into account, based on data from the Caltrans statewide model.

Planning Areas

Alameda County has been subdivided into four areas of analysis, or planning areas and include local jurisdictions as follows:

- North Planning Area: Albany, Berkeley, Emeryville, Oakland and Piedmont
- Central Planning Area: Hayward, San Leandro and unincorporated Alameda County
- South Planning Area: Fremont, Newark and Union City
- East Planning Area: Dublin, Pleasanton, Livermore and unincorporated Alameda County

These planning areas also correspond to the five MTC super districts in Alameda County,[21] as part of the traffic analysis zone structure developed for the countywide travel model which refined the 1,454-zone structure MTC uses[22] for its nine-county regional travel model.

Traffic analysis zones are small geographical subdivisions of a region. Socioeconomic variables, such as households and employment data, are collected at the traffic analysis zone level for input into the travel demand models. Ultimately, the auto vehicle trips and number of individual trips on transit ("person trips") are assigned from each traffic analysis zone onto the highway and transit networks.

The countywide model required disaggregating or splitting the MTC zones into more, smaller traffic analysis zones. Within Alameda County, MTC's zone system was refined to better suit the more detailed highway and transit networks in the countywide model. The traffic analysis zones nest within the larger MTC zones. This ensures accurate disaggregation of MTC's person trip tables to the traffic zones, and allows direct comparisons between the Alameda countywide model outputs and those of the MTC model. As a result of this zone refinement effort, the model contains:

- 1,580 TAZs within Alameda County

[21] MTC superdistricts 18 and 19 comprise North County Planning Area, while superdistricts 17, 16, and 15 equate to Central County, South County, and East County Planning Areas, respectively.

[22] MTC is in the process of updating its zone system to expand the TAZs and to add a Micro Analysis Zone (MAZ) to better capture local bike and walk trips.

- 159 TAZs in buffer areas (52 in West Contra Costa County, 48 in South Contra Costa County, 26 in San Joaquin County, and 33 in Santa Clara County)
- 1,097 TAZs in the remainder of the Bay Area, same as MTC's RTAZs
- 31 gateway zones

Maps of the 1,580 TAZs within Alameda County, grouped by the four planning areas, are available on the Alameda CTC website.

Transportation System Network

The countywide model road network includes the following road types:

- Freeways
- Freeway ramps and metered ramps
- State routes
- Arterial streets
- Collector streets that carry traffic through neighborhoods to adjacent neighborhoods
- Streets likely to be analyzed in a local traffic study

The transit network in the countywide model was developed from the MTC model network with refinements to match the additional zonal detail within Alameda County. The 2014 model update added bicycle network infrastructure (bike lanes and paths) to support the model enhancements to estimate bicycle trips.

Model Results

The model produces the following countywide travel information:

- Trip generation
- Trip distribution
- Modal split of inter-zonal trips for home-based work trips and total trips
- Forecast of trips originating or destined to external zones
- Peak-hour LOS and traffic-volume projections by segment (2010, 2020, and 2040)
- Directional miles of congestion, by type of facility (arterial, freeway)
- Mean highway speed
- Transit accessibility
- VMT, by facility and by LOS
- Travel times for selected origin-destination (O-D) pairs
- Greenhouse gas emission for primary pollutants

Model Adequacy

The model has been tested and validated for conditions of the most recently completed U.S. Census year (2010)[23]. The validation procedure compared the model outputs to observed traffic volumes and transit ridership data. During validation, adjustments were primarily made to model inputs, such as the road network and base-year land uses, rather than calibrated parameters such as trip-generation rates or distribution factors. Based on the model calibration, MTC consistency check, and the model validation, Alameda CTC made the following conclusions:

- The countywide model is generally consistent with the MTC model in terms of numbers and types of trips, distribution between the Bay Area counties, and travel modes;
- The model estimates reasonable numbers of vehicles and transit riders to and from Alameda County; and
- The countywide model estimates 2010 base year traffic on most screen lines and major regional facilities at a level of accuracy sufficient to support

[23] During the next model update, the model base year is anticipated to be updated to 2020 to be consistent with the most recent U.S. Census.

evaluation of peak-hour traffic patterns on the CMP network.

Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP.[24] Among those requirements, Alameda CTC must find compliance with the development of the land use and socioeconomic database in the Countywide Travel Demand Model, which must be consistent with the regional land use database and assumptions of the regional travel demand model. Alameda CTC works with local jurisdictions to develop the countywide database by allocating ABAG's housing and job projections to a refined-scale zone system for countywide model traffic analysis. The county-level totals from the two allocations must be within plus or minus 1 percent, per MTC's established guidelines as described in Chapter 9.

Alameda CTC's land use database development process typically happens during the Countywide Travel Demand Model update. During this process, local jurisdictions are required to review a draft allocation of ABAG totals to the Countywide Travel Demand Model TAZs. Local jurisdictions then have 60 days to provide input on this draft allocation. The detailed process for finding non-conformance and the resulting withholding of Proposition 111 funds is described in Chapter 9.

Next Steps

Alameda CTC will continue to update or further refine the Alameda County Travel Demand Model as part of the requirements to update the land use database and network assumptions to the latest Regional Transportation Plan and Sustainable Communities Strategies as they are adopted. The next time the countywide model will need to be updated is 2022 to correspond with Plan Bay Area 2050. Future updates to the countywide model will include:

- Evaluating options to enhance the forecasting ability of the Alameda CTC Countywide Travel Demand Model. This will include assessing options for modifying and refining the regional travel model for use in Alameda County as well as assessing more current industry alternatives. This will also include exploring a possible collaboration with Contra Costa County on travel demand modeling.
- Continuing to ensure consistency with the regional model requirements.

[24] California Government Code Section 65089.3.

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Capital Improvement Program 8


Warm Springs BART Station, Fremont

As part of the CMP, Alameda CTC must develop a Capital Improvement Program to identify projects intended to maintain or improve the performance of the multimodal transportation system in Alameda County, to move people and goods, and to mitigate regional transportation impacts identified through the Land Use Analysis Program[25]. Capital Improvement Program projects must conform to the Regional Transportation Plan (RTP), the Alameda Countywide Transportation Plan (CTP), and air quality mitigation measures[26] for transportation-related vehicle emissions.

As the Regional Transportation Planning Agency for the Bay Area, the Metropolitan Transportation Commission (MTC) is responsible for developing regional project priorities for the Regional Transportation Improvement Program (RTIP) for the nine counties of the Bay Area. As part of the CMP, Alameda CTC must also include in the Capital Improvement Program the list of projects proposed for Alameda County's share of State Transportation Improvement Program (STIP) funding. MTC incorporates the list of Alameda County's proposed STIP projects into the RTIP. MTC then submits the RTIP to the California Transportation Commission (CTC) for inclusion in the STIP.

In 2013, Alameda CTC adopted a Strategic Planning and Programming Policy to consolidate existing planning and programming processes to improve the efficiency and effectiveness of future policy decisions on transportation investments in Alameda County. This policy directed the development of Alameda CTC's Comprehensive Investment Plan (CIP), a programming and allocation document that identifies funding under Alameda CTC's programming purview toward countywide transportation projects and programs over a five-year horizon. The CIP translates long-range plans into a short-range investment strategy by establishing a list of near-term priority improvements to enhance and maintain Alameda County's multimodal transportation system. The first CIP was adopted in June 2015 and the most recent CIP (2020 CIP), adopted in June 2019 covers fiscal years 2019-20 through 2023-2024.

Alameda CTC's CIP serves as the CMP Capital Improvement Program and has three primary objectives:

- **Translate long-range plans into short-range implementation** by focusing on project/program delivery over a five-year programming window with a two-year allocation plan.

[25] California Government Code Section 65089(b)(5).

[26] The Air Quality Mitigation Measures are contained in the BAAQMD's 2017 Bay Area Clean Air Plan.

- **Serve as Alameda CTC's strategic plan** for voter-approved transportation funding (such as 1986 Measure B, 2000 Measure B, 2010 Vehicle Registration Fee, and 2014 Measure BB) as required by the respective legislation for each funding program. The revenue and expenditure assumptions for each fund source are confirmed annually and serve as the basis for the financial management of each fund source.
- **Establish a comprehensive and consolidated programming and allocation plan** for fund sources under Alameda CTC's authority for capital improvements, operations, and maintenance projects and programs. The CIP integrates all fund sources into one programming document that ensures coordinated programming and allocation of funds to maximize the effectiveness of transportation investments in the Alameda County transportation system.

Each year, Alameda CTC's CIP financial assumptions are updated to include the latest revenue projections. New projects and programs are considered through updates of the CIP, generally occurring every two years.

Relationship of CIP to Other Plans and Studies

Projects included in the Capital Improvement Program must be consistent with the RTP and the CTP. To identify transportation needs and improvements to include in Alameda CTC's CIP, Alameda CTC performs periodic monitoring and uses the following various countywide and areawide/corridor studies or plans.

Regional Transportation Plan

Since the RTP action element is required to consider the congestion management actions occurring within the region, projects selected for the Capital Improvement Program must be consistent with the assumptions, goals, policies, and actions identified in the RTP. The RTP, prepared by the MTC, is the basic statement of the Bay Area transportation investment policy. Because of the interdependence of transportation planning and other regional planning, the regional plan strives to adopt policies that complement and support programs of federal, state, and regional agencies.

Adopted in July 2017, the most recent RTP, Plan Bay Area 2040 (PBA 2040), is a focused update of the region's previous integrated transportation and land use plan, Plan Bay Area 2013 (PBA 2013). As required by Senate Bill 375, PBA 2013 integrates land use and transportation in one Sustainable Communities Strategy to reduce greenhouse gas emissions from the transportation sector. The investment policy for PBA 2040 continues the approach adopted in PBA 2013 and focuses more on preserving and maintaining the existing transportation infrastructure, supporting Priority Development Areas and Priority Conservation Areas, and investing in transit. PBA 2040 investments focus on operating, maintaining, and modernizing the existing transportation system with limited and strategic expansion. PBA 2040 includes seven specific goals and 13 related performance targets (see Chapter 9, "Program Conformance and Monitoring"). Two of the seven goals were legislatively required for housing and climate protection and have mandated targets. The next update to PBA 2040, called PBA 2050, is underway and is anticipated by adopted in summer of 2021.

Countywide Transportation Plan

Each county within the jurisdiction of MTC prepares a long-range transportation plan (countywide transportation plan) in cooperation with the respective cities, county, and transit operators.[27] The CTP is the basis for the county's component of the RTP.

The Commission adopted the most recent CTP for Alameda County in May 2016 that resulted from a comprehensive effort and coordination with various

[27] Assembly Bill 3705 (Eastin), Statutes of 1988.

regional and local agencies. Alameda CTC coordinated development of the 2016 CTP with MTC's development of PBA 2040 and focused on identifying projects to meet the long-term transportation needs to better integrate land use and transportation to reduce greenhouse gas emissions in Alameda County. Performance-based planning used for the first time in the 2012 CTP was continued in the 2016 CTP. This approach effectively identified projects and programs that meet the adopted vision and goals for the plan. Alameda CTC used a set of performance measures to provide an objective and technical means to measure how well projects and programs performed together to meet the goals. The next update to the CTP (2020 CTP) is currently underway and is anticipated to be adopted by the end of 2020. The CTP update is being coordinated with the PBA 2050 development.

The 2016 CTP's vision and goals for Alameda County are as follows:

Alameda County will be served by a premier transportation system that supports a vibrant and livable Alameda County through a connected and integrated multimodal transportation system promoting sustainability, access, transit operations, public health, and economic opportunities.

The Alameda County transportation system will be:

- **Accessible, affordable and equitable** for people of all ages, incomes, abilities and geographies
- **Integrated** with the land use patterns and local decision-making
- **Connected** across the county, within and across the network of streets, highways and transit, bicycle and pedestrian routes
- **Multimodal**
- **Cost effective**
- **Safe**
- **Reliable and efficient**
- **Well maintained**
- **Supportive of a healthy and clean environment**

The 2016 CTP serves as a performance-based, long-range plan for Alameda County's multimodal transportation network through 2040. The vision and goals for the Alameda Countywide Transportation Plan were originally developed during the 2012 CTP update in parallel with development of a new Transportation Expenditure Plan (adopted by over 70 percent of voters in 2014 as Measure BB). The process was comprehensive and grounded with extensive input from a broad range of stakeholders. As such, the vision statement and goals capture the broad array of needs and transportation system demands in a county as diverse and large as Alameda County.

Air Quality Attainment Plans

The CMP CIP is closely related to federal and state air quality attainment plans regarding transportation-related vehicle emission air quality measures. Because the Bay Area failed to attain national ambient air quality standards before the 1977 Federal Clean Air Act Amendments' 1987 deadline, a revised State Implementation Plan (SIP) was developed. The purpose of this plan is to show the measures to be taken to reduce air pollution and maintain compliance with federal requirements for annual emission reductions. The RTP is required by federal law to conform to the SIP.

State air quality legislation, specifically the California Clean Air Act of 1988, requires the Bay Area Air Quality Management District (BAAQMD) to prepare a Clean Air Plan designed to bring the Bay region's air basin into compliance with state air quality standards by the earliest practicable date. The Clean Air Plan must include transportation control measures as well as stationary (e.g., oil refinery) source controls to achieve and maintain the respective standards for ozone and carbon monoxide. Other legislation established a joint process between the MTC and BAAQMD for preparing the transportation control measures plan as part of the

State Clean Air Plan.[28] BAAQMD adopted the most recent Clean Air Plan in 2017.[29]

To respond to air quality and climate protection challenges in the years ahead with a comprehensive planning approach, BAAQMD developed the 2017 Clean Air Plan to be a dual plan—to include the required update to the Bay Area's State ozone plan as well as to serve as a multi-pollutant action plan, consistent with the GHG reduction targets adopted by the State of California, to protect public health and the climate. The 2017 Clean Air Plan Control Strategy component builds on a solid foundation established by the 2010 Clean Air Plan Control Strategy, the 2005 Ozone Strategy, and previous ozone plans prepared in the 1991-2005 period. It includes updated and new measures in the following control measure categories: Stationary Source, Transportation Sector, Buildings Sector, Energy Sector, Agricultural Sector, Natural and Working Lands Sector, Waste Sector, Water Sector, and Super-GHG Pollutants. Out of the total 85 control measures in the 2017 Clean Air Plan, 23 are Transportation Sector measures.

The federal and state transportation control measures listed in the attainment plans have implications for county CMPs. MTC will give priority to proposed projects that support or help implement any of the transportation sector measures outlined in this revised Clean Air Plan (see Appendix H for federal and state transportation control measures).

Areawide and Corridor Studies

The 2016 CTP focused on maximizing the efficiency and effectiveness of our existing multimodal infrastructure and identified a need for advanced and integrated corridor management, re-emphasizing the prior policy on corridor/areawide transportation management planning, which is described in Chapter 6, "Land Use Analysis Program." As part of the 2012 CTP, Alameda CTC developed a Briefing Book and many issue papers on key transportation issues. These collectively identified transportation issues to address, potential focused plans/studies to develop and strategies to explore as part of those plans, and studies to develop an accessible, reliable, and safe multimodal transportation system in Alameda County that is well connected and better integrated with land use.

As part of the next steps identified in the 2012 CTP, Alameda CTC developed a comprehensive TDM strategy that the Commission adopted in May 2013. Alameda CTC also developed and adopted three countywide modal plans in 2016—Countywide Goods Movement Plan, Countywide Multimodal Arterial Plan, and Countywide Transit Plan.

The three modal plans being implemented do the following:

- Provide valuable information and performance measures to assess short-and long-term impacts to roadways, alternative modes, land use, and goods movement, as well as possible solutions;
- Identify comprehensive approaches to congestion management that offer improvement options to a larger multimodal network, where level-of-service standards have been or are expected to be exceeded; and
- Provide support that allows each community within the corridor/area to demonstrate how the community's share of cumulative/regional transportation impacts could be mitigated through cooperative planning and investment.

Based on the outcome of the modal plans and as part of the next steps identified in the 2016 CTP, Alameda CTC is in the process of developing the following corridor studies that will identify specific implementable projects and strategies:

[28] Assembly Bill 3971 (Cortese).

[29] 2017 Bay Area Clean Air Plan adopted by BAAQMD in April 2017.

- East 14th Street/Mission Boulevard and Fremont Boulevard Multimodal Corridor Project
- San Pablo Avenue (State Route 123) Multimodal Corridor Project

A Diversified Investment Strategy

The 2016 CTP points to an integrated and diversified investment strategy for congestion management and environmental sustainability through connecting land use and transportation investment, and improving multimodal options. The following findings highlight this need for a strategy, which includes all reasonable options:

- The 2016 CTP includes $9.5 billion in projects, programs, and planning studies.
- Even with this extensive investment, the Countywide Travel Demand Model forecasts congestion to become severe by 2040. Therefore, Alameda County cannot rely solely on investment in facilities as a way out of the congestion problem.
- The transportation needs in Alameda County outweigh the available revenues over the 24-year period.
- The Briefing Book and issue papers developed for the 2012 CTP made it apparent that all available diverse and multimodal options must be considered to sustain an acceptable level of mobility, improved connectivity, and environmental sustainability in Alameda County—these options include land use strategies, pricing strategies, managing the existing multimodal system better to stretch its capacity, better TDM options for trip reduction, carefully selected transportation investments, new and/or expanded revenue sources, and other approaches which may surface, including strategies to reduce vehicle miles traveled and reduce greenhouse gas emissions.
- Any single approach by itself is unlikely to be successful.

Through a performance-based evaluation in the development of the CTP, Alameda CTC has considered operational improvements intended to efficiently use existing facilities, improve transit investment and coordination, and support transit oriented developments (PDAs), intermodal freight facilities, non-motorized facilities, as well as other investment strategies to address all transportation issues. As mentioned in Chapter 6, "Land Use Analysis Program," Alameda CTC developed a Priority Development Area Growth and Investment Strategy that supports and encourages development in the county's PDAs and aims to coordinate transportation projects and programs with the county's land use patterns. The CIP includes projects and programs that reinforce the diversified strategy identified in the CTP and supported in the Priority Development Area Growth and Investment Strategy.

Funding Sources

Various federal, state, and local funding sources fund the projects and programs identified in the CIP, which relate to the projects and programs identified in the CTP. To obtain funding from these sources, projects and programs must meet specific requirements.

Federal Surface Transportation Program

As Alameda County's congestion management agency, Alameda CTC is responsible for soliciting and prioritizing projects in Alameda County for a portion of the federal Surface Transportation Program (STP). The STP provides funding from the reauthorization of federal funding for surface transportation, the legislation by which Alameda CTC receives federal monies. MTC currently allocates these funds through its One Bay Area Grant (OBAG) Program.

Congestion Mitigation and Air Quality Program

Similar to STP funding, Alameda CTC is responsible for soliciting and prioritizing projects in Alameda County for a portion of the federal Congestion Mitigation and Air Quality Program (CMAQ). These funds are used on projects that will provide an air-quality benefit. MTC currently allocates these funds through MTC's OBAG Program.

State Transportation Improvement Program

Under state law, Alameda CTC works with project sponsors, including Caltrans, transit agencies, and local jurisdictions to solicit and prioritize projects that will be programmed through the Regional Transportation Improvement Program that makes up 75 percent of funds (county share) in the State Transportation Improvement Program. The remaining 25 percent of STIP funds are programmed at the state level and are part of the Interregional Transportation Improvement Program (ITIP). During each STIP cycle, the California Transportation Commission adopts a fund estimate that serves as the basis for financially constraining STIP proposals from counties and regions.

Transportation Fund for Clean Air Program

State law permits BAAQMD to collect a fee of $4 per vehicle per year to reduce air pollution from motor vehicles through its Transportation Fund for Clean Air (TFCA) Program. Of these funds, BAAQMD directly programs 60 percent and annually allocates the remaining 40 percent to the designated overall program manager for each county, which for Alameda County is Alameda CTC. Projects and programs that receive funding under this program must result in vehicle emission reductions and meet BAAQMD requirements for project cost effectiveness.

State Transit Assistance County Block Grant Program

Alameda CTC is responsible for soliciting and prioritizing projects in Alameda County for the State Transit Assistance (STA) funding MTC provides to the regional STA County Block Grant Program (formerly the Lifeline Transportation Program). The STA County Block Grant Program provides funds for transportation projects that serve low-income communities using a mixture of State and federal fund sources.

Regional Measure 2 and Regional Measure 3

In 2004, voters passed Regional Measure 2 (RM2), raising the toll on the seven state-owned toll bridges in the San Francisco Bay Area by $1. This extra dollar funds various transportation projects within the region determined to reduce congestion or to make improvements to travel in the toll-bridge corridors, as identified in Senate Bill 916 (Chapter 715, Statutes of 2004). In October 2017, Senate Bill 595 (Beall) passed which allowed Regional Measure 3 (RM3) to be placed on the ballot to increase bridge tolls to fund congestion-relief projects and improve mobility in the bridge corridors. RM3 includes a bridge toll increase of up to $3 and a set of projects and operational categories and was passed by voters in June 2018.

Measure B Program Funds

In 1986, Alameda County voters approved the Measure B half-cent transportation sales tax, which was reauthorized in November 2000. Approximately 60 percent of Measure B transportation sales tax dollars are allocated to 20 separate organizations via direct local distribution (DLD) funds or discretionary grant programs. The funds allocated to jurisdictions include:

- Local transportation, including local streets and roads projects (22.33 percent)
- Mass transit, including express bus service (21.92 percent)
- Special transportation (paratransit) for seniors and people with disabilities (10.5 percent)

- Bicycle and pedestrian safety (5 percent)
- Transit-oriented development (0.19 percent)

The remaining 40 percent of the transportation sales tax dollars are allocated to specific projects as described in the voter-approved 2000 Transportation Expenditure Plan. Funds are allocated through an annual strategic planning process that identifies project readiness and funding requirements. Project-specific funding allocations are made via specific recommendations approved by the Commission.

Measure BB Program Funds

In November 2014, Alameda County voters approved the 2014 Transportation Expenditure Plan (2014 TEP). This plan distributes approximately 65 percent of the net sales tax revenues to essential programs in Alameda County through DLD funds and discretionary grant awards. The DLD funds are distributed as prescribed in the 2014 TEP as follows:

- Transit Operations, Maintenance, and Safety Program (21.55 percent)
- Local Streets Maintenance and Safety (20 percent)
- Bicycle and Pedestrian Infrastructure and Safety (3 percent)
- Affordable Transit for Seniors and People with Disabilities (9 percent)

The discretionary programs are distributed based on the percentage or amounts specified in the 2014 TEP:

- Affordable Student Transit Pass Program ($15 million)
- Affordable Transit for Seniors and People with Disabilities/Coordination and Service Grants (1 percent)
- Bicycle and Pedestrian Program (2 percent)
- Community Investments That Improve Transit Connections to Jobs and Schools (4 percent)
- Congestion Relief, Local Bridge Seismic Safety ($639 million)
- Freight and Economic Development Program (1 percent)
- Technology, Innovation and Development Program (1 percent)
- Transit Innovation Program (2.24 percent)

The remaining transportation sales tax dollars (approximately 35 percent) are identified for specifically named projects as described in the 2014 TEP. Alameda CTC distributes sales tax funds for capital projects on a reimbursement basis in accordance with funding agreements between Alameda CTC and the recipient agency, or for eligible project costs incurred directly by Alameda CTC.

Vehicle Registration Fee

The Measure F Alameda County Vehicle Registration Fee (VRF) Program was approved by the voters on November 2, 2010. The $10 per year vehicle registration fee generates approximately $12 million in annual net revenue. Each year, Alameda CTC distributes 60 percent of these funds to the 14 cities and the county as DLD funds to support Local Road Improvement and Repair Programs. The remaining 40 percent of funds are used to support the following programs:

- Transit for Congestion Relief Discretionary Program (25 percent)
- Local Transportation Technology Program (10 percent)
- Pedestrian and Bicycle Access and Safety Discretionary Program (5 percent)

Proposition 1B

As approved by the voters in the November 2006 general elections, Proposition 1B enacted the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, authorizing $19.9 billion of State general obligation bonds for specified purposes. Proposition 1B includes funding for multiple programs, including the Corridor Mobility Improvement Account

(CMIA), the Trade Corridors Improvement Fund (TCIF), and the Traffic Light Synchronization Program (TLSP).

Alameda CTC has successfully secured approximately $420 million in Proposition 1B Bond funding to complete the $800 million Alameda CTC I-Bond construction program. The seven projects that use Proposition 1B funds are either complete or under construction.

Project Delivery and Timely Use of Funds Policy

In light of the focus on project delivery, Alameda CTC has adopted a "Timely Use of Funds Policy" which applies to funds allocated by Alameda CTC. For delivery of projects with funding from multiple sources, Alameda CTC incorporates its Timely Use of Funds Policy with the timely use of funds requirements for other funding, including STIP, federal STP/CMAQ, and TFCA funding. In addition, projects are also subject to regional deadlines outlined in MTC Resolution 3606.

2020 STIP

The projects identified for STIP funding are consistent with the CTP and RTP. The revenue estimate for Alameda County's share of the 2020 STIP is approximately $34.7 million. The Alameda CTC Commission is scheduled to approve the following list of 2020 STIP projects from Alameda County in October 2019. MTC will consider these projects for incorporation in to the RTIP that will be forwarded to the California Transportation Commission for the 2020 STIP.

Table 8.1—Projects Recommended for Funding in the 2020 STIP ($ x 1,000)

Upon adoption of the 2020 STIP program by the Alameda CTC Commission in October 2019, this table will be updated and the 2020 STIP projects information will be sent to MTC.

Index #	Project	Proposed for 2020 STIP ($ x 1,000)
1		
2		
3		
4		
5		
6		
7		
8		
	Total	**$**

The Comprehensive Investment Plan (CIP)

Alameda CTC is responsible for planning, programming, and allocating local, regional, state, and federal funding from a number of sources for transportation investments throughout Alameda County. The investments approved by Alameda CTC result in a wide range of transportation improvements and services that facilitate safe, efficient, and accessible travel for all types of transportation in all parts of Alameda County.

Alameda CTC updates the CTP every four years, which matches the approximately 30-year horizon of the RTP and establishes the Alameda County vision and goals for transportation over the planning horizon. Alameda CTC also prepares short- and long-range plans to address needs and priorities for transit, highways, roads, goods movement, transportation for seniors and people with disabilities, bicycle and pedestrian facilities and programs, and community-based transportation improvements that link transportation, housing, and jobs countywide.

Alameda CTC's CIP brings the long-range and countywide plans into the near term by focusing on investments over a five-year programming and allocation window. The CIP identifies a list of near-term priority transportation improvements to enhance and maintain Alameda County's transportation system in accordance with the objectives established in the CTP. The CIP identifies anticipated transportation funding over a five-year horizon and strategically matches the funding sources to targeted investments in Alameda County's transportation system. The programming and allocation recommendations included in the CIP establish funding commitments under Alameda CTC's purview to projects and programs that maintain and enhance the countywide transportation system.

Figure 8.1 – Summary of CIP Investments by Transportation Mode

(Dollars in Thousands)

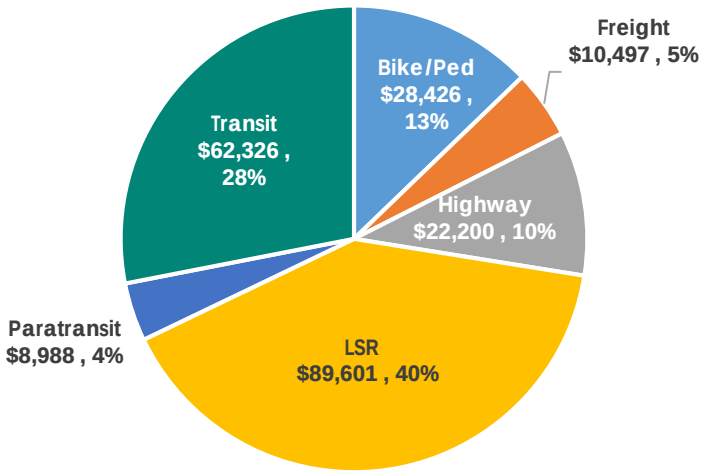
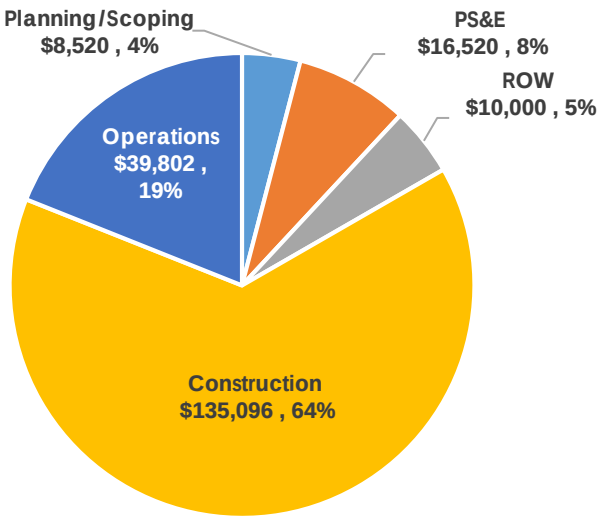


Figure 8.2 – Summary of CIP Investments by Phase

(Dollars in Thousands)



Once funds are allocated, they become subject to the Alameda CTC Timely Use of Funds Policy to ensure timely implementation of the intended improvements or services funded by the allocation.

Five-Year CIP and Two-Year Allocation Plan

The 2020 CIP adopted in June 2019 includes programming, allocation, and technical adjustment recommendations within the five-year programming and allocation window, from fiscal years 2019-20 through 2023-24. The 2020 CIP incorporates the new programming and allocation recommendations and carries forward the programming policies and project selection criteria from the 2018 CIP. Projects and programs included in the CIP and funded by sources aside from Measure BB were selected through the specific guidelines associated with those sources. The funds programmed over the five-year CIP horizon totals $213.4 million from a variety of sources. The two-year allocation plan totals $155 million.

CIP Update Process

The Alameda CTC's CIP is updated annually, at a minimum to incorporate any off-cycle programming actions into the CIP document. Every two years, Alameda CTC comprehensively updates the CIP to review existing CIP projects and to open a nomination window for new projects. The biennial update occurs on odd number fiscal years and represents a shift of the programming window to add the next two fiscal years. Biennial CIP updates include a review of existing projects and programs to determine whether to recommend continuing or postponing funding and delaying, removing, or reincorporating projects/programs. Alameda CTC may recommend additional funding to continue existing approved projects. As part of this update, Alameda CTC opens a nomination window to consider new projects for additional capacity created with the two-year shift of the programming horizon. Projects submitted during the nomination window that meet the Commission-adopted screening criteria are evaluated and prioritized for funding consideration. Periodically, Alameda CTC reassesses the CIP development process, prioritization methodology, and allocation process for consistency with any updated policies and goals. Alameda CTC updates and amends the CIP accordingly to account for changes to project funding resulting from schedule modifications, changes in priorities, new policies, regulations or laws, and funding adjustments.

Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP.[30] Among the requirements, Alameda CTC must develop a CMP Capital Improvement Program that includes projects and programs to improve or maintain the performance of the countywide multimodal transportation system. Alameda CTC's Comprehensive Investment Plan (CIP), updated in coordination with the local jurisdictions and transit agencies will continue to serve as the CMP Capital Improvement Program. The CTP updated every four years will inform Alameda CTC's CIP development process.

Next Steps

- Through the next CMP update in 2021, Alameda CTC will continue its coordination of long-range planning documents with short-range implementation via the Alameda CTC's CIP. In spring of 2021, the CIP will receive its next full, biennial update, including new revenue projections and project/program allocations for FY 2021-22 through FY 2025-26 and will continue to reflect a

[30] California Government Code Section 65089.3.

combination of near-term transportation investments to achieve the vision and goals of the 2020 CTP and the Alameda CTC's modal plans (Countywide Goods Movement Plan, Countywide Multimodal Arterial Plan, Countywide Transit Plan and Countywide Active Transportation Plan).

- With the passage of Senate Bill 1 (SB 1), the Road Repair and Accountability Act of 2017, on April 28, 2017, California is estimated to receive over $50 billion by 2027 for various state and local investments. SB 1 contains a focus on road maintenance and rehabilitation investments, with a significant amount of SB 1 funding going directly to local jurisdictions based on a formulaic distribution contained in the bill. The California Transportation Commission (CTC) is responsible for the administration of SB 1 revenues and is currently in the process of developing additional policy framework and guidelines for a number of existing and newly created SB 1 programs. Over the next two years, Alameda CTC will work collaboratively with the CTC and the MTC to administer the programming of SB 1 funds based on the programming process set forth by the CTC's guidelines. Future SB 1 funds programmed through Alameda CTC will be incorporated, when feasible, within Alameda CTC's CIP programming and allocation process.

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Deficiency Plans

10

San Leandro Boulevard under BART track near rail crossing, San Leandro

Congestion Management Program(CMP) legislation requires preparation of deficiency plans when a CMP roadway segment does not meet the adopted level of service (LOS) standard, which is LOS E for Alameda County CMP roadways. As previously noted, this is in direct conflict with the provisions and intent of SB 743 and the updated CEQA guidelines regarding the significance metric for traffic impact analysis. Deficiency plans are required to analyze the causes of congestion and determine whether localized improvements can address them or if it would be best to employ measures that will improve overall system efficiency and air quality. Deficiency plans also provide local governments the opportunity to give priority to systemwide and non-capital mitigation methods to relieve congestion. The statutes specifically point to improved public transit service and facilities, improved non-motorized transportation facilities, high occupancy vehicle (HOV) facilities, parking cash-out programs, and transportation control measures.

Requirements

The need for deficiency plans is identified following the biennial LOS monitoring of the CMP roadway network. Deficiency plans are required when a CMP segment does not meet the adopted LOS standard, after allowable exemptions. At a minimum, deficiency plans must include:

- Identification and analysis of the causes of the deficiency;
- A list of improvements necessary for the deficient segment or intersection to maintain the minimum LOS required and the estimated costs of the improvements;
- A list of improvements, programs, or actions (and estimates of their costs) that will measurably improve multimodal performance of the system and contribute to significant improvements in air quality; and
- An action plan of the most-effective implementation strategies to maintain the minimum LOS standards on the deficient segment, or to improve the current and future LOS, and contribute to significant air-quality improvements. The action plan must include implementation strategies, a specific implementation schedule, and a description of funding and implementation strategies. Special consideration for state or federal requirements must be taken into account when determining the feasibility of the action plan. Improvements funded through the CMP Capital Improvement Program, whether having local or system impact, must not degrade air quality.

Deficiency Plan Types

Two types of deficiency plans can be developed, depending on the needs of the local jurisdiction(s) and how and whether the deficiency can be mitigated. If more than one local jurisdiction is responsible for causing a deficient segment, all responsible local jurisdictions must participate in development and approval of a multi-jurisdictional deficiency plan. Local jurisdictions outside Alameda County that contribute significantly to a deficiency plan will be invited to participate but cannot be compelled to do so.

Localized Deficiency Plan

This type of plan is appropriate for addressing transportation impacts to a single CMP segment or roadway identified as or anticipated to become deficient based on LOS monitoring. The Localized Deficiency Plan focuses on analyzing the cause of deficiency by including the immediate surrounding area as the project area and identifying the list of improvement or mitigation measures in the action plan.

Areawide Deficiency Plan

This type of plan is appropriate for addressing transportation impacts to more than one CMP roadway in a larger geographic area not able to be mitigated back to conformance within the CMP LOS standards if considered individually within a localized area. The Areawide Deficiency Plan focuses on offsetting the deficiency by including the broader surrounding area as the project area and identifying a list of improvements, programs, or actions to improve the performance of the larger multimodal network.

Guidelines

As part of the 2017 CMP update, Alameda CTC updated the deficiency plan guidelines that describe the approval process, timelines, and acceptable methodologies for jurisdictions to use in development and approval of deficiency plans. The guidelines are in Appendix D. The update includes details and clarification on completion of the deficiency plan implementation. Specifically, a deficiency plan can be considered fully implemented, if the local jurisdiction determines, and Alameda CTC concurs, that the implementation of the deficiency plan resulted in a measurable improvement in LOS, bringing the formerly deficient segments into compliance with the LOS standards. For deficiency plans that include both near-term and long-term actions, if completion of the near-term actions resulted in a measurable improvement in LOS, and has demonstrated compliance with LOS standards for at least five years, Alameda CTC and the local jurisdiction may consider implementation of the deficiency plan to be complete without the completion of the long-term actions.

Conflict Resolution

CMP legislation requires each congestion management agency to establish a conflict-resolution process for addressing conflicts or disputes between local jurisdictions in meeting the multi-jurisdictional deficiency plan responsibilities.

The intent of Alameda CTC's conflict-resolution process is to help local jurisdictions resolve conflicts that arise during multi-jurisdictional deficiency plan development or implementation that could impact the CMP conformance of one or more jurisdictions. The conflict resolution process is intended to be an effective and flexible process that responds to the issues and concerns of the respective jurisdictions.

Alameda CTC's conflict resolution process is based on the following principles.

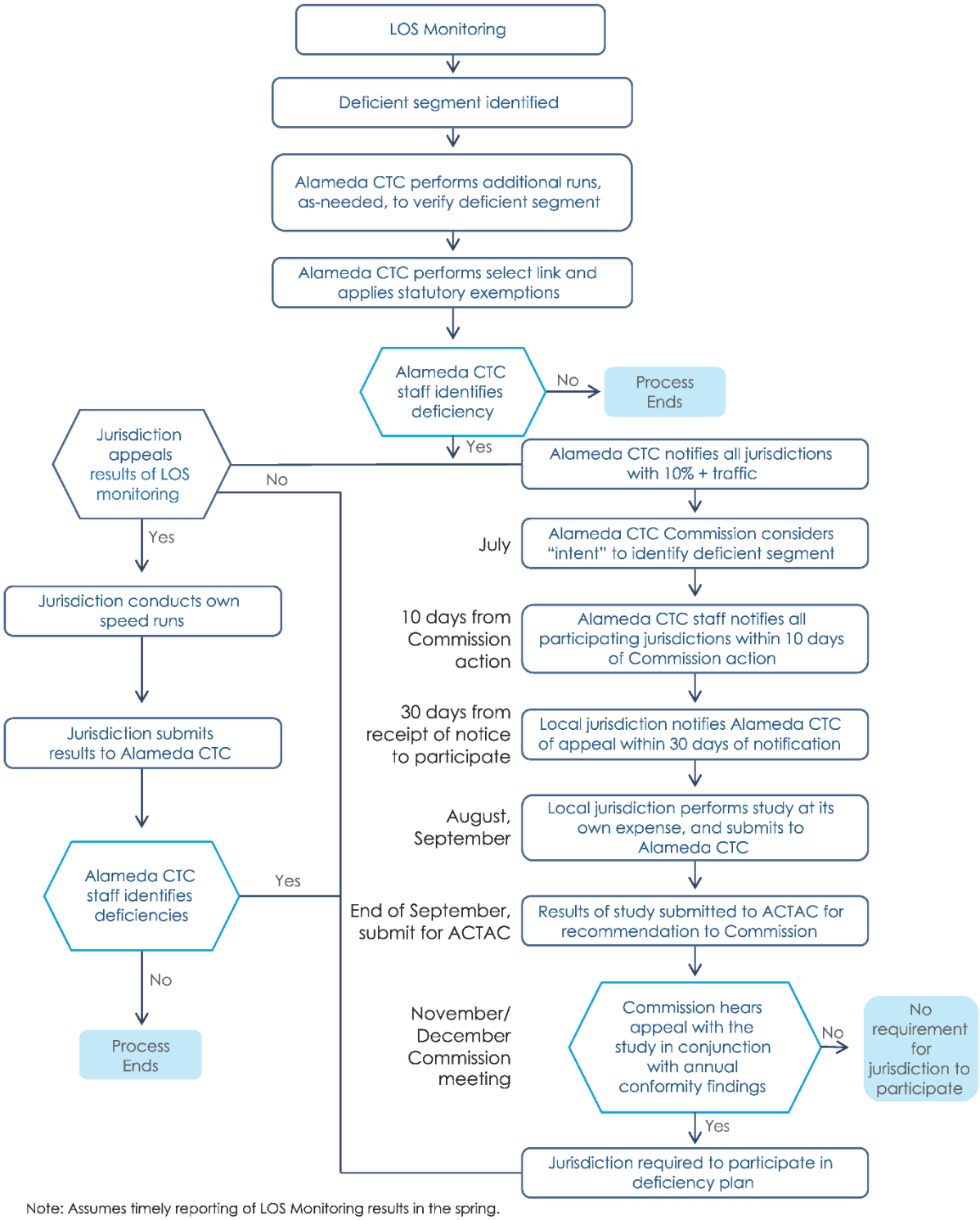
- First, consensus at the local level on the resolution of conflicts is encouraged through the Alameda County Technical Advisory Committee (ACTAC).
- Second, when ACTAC is unable to reach consensus, Alameda CTC will look for evidence of "good faith" efforts among the parties involved when determining CMP conformance.

- Finally, any determination by Alameda CTC with respect to CMP conformance will not affect local agencies' land use authority or require programs that conflict with a community's fundamental socioeconomic or environmental character. The conflict resolution process has the following four phases:

  1. **Process initiation:** The lead jurisdiction requests Alameda CTC to initiate the conflict resolution process and outlines the issues needing resolution.
  2. **Assessment of issues:** Alameda CTC staff meets with the parties involved to assess the issues in the dispute and its appropriateness for the conflict resolution process.
  3. **Settlement sessions and agreement:** This phase involves holding/facilitating settlement sessions among the parties involved, facilitated by Alameda CTC staff (if appropriate), and the development of a settlement agreement, and obtaining all approvals that may be required from the governing bodies of the involved jurisdictions and/or Alameda CTC.
  4. **Implementation and monitoring:** The final phase involves the implementation and monitoring of the agreement and Alameda CTC's assessment of good faith effort by the parties involved.

The conflict-resolution process outlined here is a general process that can be adjusted to meet the respective needs of local jurisdictions and/or the specific situation including identifying another mutually agreed upon conflict resolution process. See Figure 10.1, which describes the multi-jurisdictional deficiency plan appeal process.

Figure 10.1—Multi-jurisdictional Deficiency Plan Appeal Process



Note: Assumes timely reporting of LOS Monitoring results in the spring.

Completed and In-Progress Deficiency Plans

Tables 10.1 and 10.2 show the status and progress of the most recent deficiency plans. Table 10.1 shows the roadway or ramp segments that have completed implementation of the required deficiency plans. Table 10.2 shows the roadways segments with deficiency plans being implemented.

Table 10.1—Complete Deficiency Plans

Segment	Jurisdiction	Year Required/ Approval	Implementation Status
Westbound I-580, from Center Street to I-238	Alameda County (participant jurisdictions: Dublin, Livermore, Oakland, Pleasanton, San Leandro)	2000/2001	Deficiency plan has been implemented, LOS standard restored.
Northbound San Pablo Avenue, from Allston Way to University Avenue	Berkeley (participant jurisdictions: Albany, Emeryville, Oakland)	1998/1999	Deficiency plan has been implemented, LOS standard restored.
Southbound University Avenue, from San Pablo Avenue to 6th Street	Berkeley	1998/1999	Deficiency plan has been implemented, LOS standard restored.
Eastbound Mowry Avenue, from Peralta Boulevard to SR-238/ Mission Boulevard	Fremont (participating jurisdiction: Newark)	2000/2001	Deficiency Plan has been implemented. LOS standard restored.

Table 10.2—Deficiency Plans Under Implementation

Segment	Jurisdiction	Year Required/ Approval	Implementation Status
The freeway connection between SR-260 Eastbound (Posey Tube) and Northbound I-880	Oakland (participating jurisdictions: Alameda, Berkeley)	1998/1999	Deficiency plan is being implemented.
Northbound SR 185 (14th Street) between 46th and 42nd Avenues	Oakland (participating jurisdiction: Alameda)	2008/2009	Deficiency plan is being implemented.

Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP. Among these requirements, Alameda CTC must find compliance with the implementation of approved deficiency plans to maintain LOS standards on the CMP network. When a deficiency plan is adopted and active, the lead jurisdiction must submit status reports on the implementation of the deficiency plan showing progress and concurrence from the participating jurisdictions to Alameda CTC annually as part of the annual conformity process. If after 90 days of the conformity timeline the local jurisdiction is still in non-conformance, Alameda CTC is required to follow the conformance process as identified in Chapter 9, "Program Conformance and Monitoring." The detailed process for finding of non-conformance and the resulting withholding of Proposition 111 funds is described in Chapter 9.

Next Steps

Based on the legislative actions/decisions regarding the CMP reform, the deficiency plan and related conformity requirements will be modified for the next CMP update, as appropriate.

Conclusions and Future Considerations

11

Aerial view of San Leandro BART Station

The CMP contains several interrelated elements which improve decision-making about transportation, land development, and air quality. Over the years, Alameda County's CMP has evolved from a program focused on meeting the legislative requirements to a robust effort that uses the legislative mandate as an opportunity to develop an integrated and multimodal transportation system for all users of the Alameda County transportation network better integrating land use and transportation and reducing greenhouse gas emissions from transportation.

However, as mentioned previously, given the anticipated changes to the CMP legislation due to other legislative efforts, particularly SB 743, Alameda CTC only made minor revisions to the CMP as part of the 2019 update. As guidance from state and regional authorities emerges which resolves existing conflicts between current CMP legislation and SB 743, the CMP will be updated accordingly. The following conclusions and future considerations, therefor focus on how the 2019 CMP meets the legislative requirements while highlighting some key issues to be considered in the future.

Conclusions

Based on the 2019 CMP updates, the following conclusions can be reached about the CMP relative to the requirements of law and its purpose and intent. The CMP fulfills the spirit, purpose, and intent of the legislation because it:

1. **Contributes to maintaining or improving transportation system service levels.**

The projects and programs contained in the CMP are a subset of the transportation investments adopted in the Alameda County 2016 Countywide Transportation Plan. The CMP can be viewed as the short-range implementation program for the CTP.

2. **Conforms to MTC's criteria for consistency with Plan Bay Area.**

Table 11.1 on the following page lists the Metropolitan Transportation Commission's 2019 consistency requirements for CMPs in the Bay Area region. The CMP has met all these requirements.

Table 11.1—MTC's Regional Consistency Requirements for CMP

RTP Consistency
Have the RTP goals and objectives been included in the CMP?
Does the CMP include references to Resolution 3434?
CMP System
Have all state highways and principal arterials been included?
Are all state highways identified?
Has the CMA developed a clear, reasonable definition for "principal arterials" as part of its submittal plan?
Has this definition been consistently applied in the selection of arterials to include in the designated system? If not, why?
Does the CMP system connect to the CMP systems in adjacent counties?
Air Quality Requirements
Does the CMP include locally implementable federal and state TCMs, as previously documented and included in MTC's Plan Bay Area, MTC Resolution 2131, and the BAAQMD's Bay Area 2017 Clean Air Plan Control Strategy?
Modeling Consistency (on completion of the current update to the countywide model)
Are the regional "core" assumptions for auto operating costs, transit fares and bridge tolls being used, or are reasons to the contrary documented?
Does the forecasting model include transit and carpool use (through either a person trip generation model or a "borrowed share" approach)?
Does the model produce trip distribution results that are reasonably consistent with those of MTC?
Is the modeling methodology documented?
LOS Consistency
Is LOS assessed using a methodology agreeable to MTC?
RTIP Requirements
Are the proposed RTIP projects consistent with the Plan Bay Area?
Process
Has the CMP been developed in cooperation with all concerned agencies (i.e., transit agencies, applicable air quality district(s), MTC, adjacent counties, etc.?)
Has the CMP been formally adopted according to the requirements of the legislation?

Note: Detailed requirements for regional consistency are outlined in MTC Resolution 3000, revised in October 2015.

3. **Provides a travel model consistent with MTC's regional model.**

The Alameda Countywide Travel Demand Model was updated to include the land uses and projects and programs in Plan Bay Area 2040 for which MTC approved the model conformance.

4. **Is consistent with MTC's adopted Transportation Control Measures.**

The transportation control measures in the Regional Transportation Plan for the Bay Area based on the federal and state air quality plans are shown in Appendix H. The CMP includes many project types and programs identified in the plan.

5. **Specifies a method for estimating roadway level of service consistent with state law.**

Two approaches are permitted by the law for assessing LOS. The Alameda County CMP specifies using the 1985 Highway Capacity Manual (HCM1985) for LOS monitoring and conformity purposes and the HCM2000 for the Land Use Analysis Program.

6. **Identifies candidate projects for the RTIP.**

The Regional Transportation Improvement Program candidates listed in the CMP's Capital Improvement Program meet MTC's requirements for inclusion in the STIP program.

7. **Was developed in cooperation with jurisdictions and other interested parties.**

Prior updates of the CMP included working with interested parties through meetings and regular mailings, and updates and notifications on the Alameda CTC website. The 2019 update was reviewed by the Alameda County Technical Advisory Committee; the Planning, Policy and Legislation Committee; and the Alameda County Transportation Commission.

8. **Provides a forward-looking approach to the impact of local land use decisions on transportation.**

The Land Use Analysis Program allows consultation with Alameda CTC early in the land development process. Early input will help ensure a better linkage between land use decisions and transportation investment.

The 2019 CMP update retained the expanded discussion of Alameda CTC's activities identified during the two prior updates to fulfill the legislative requirements of Senate Bill 375 and Assembly Bill 32 to better integrate transportation and land use and to reduce greenhouse gas emissions by curtailing VMT.

9. **Considers the benefit of greenhouse gas reductions in developing the CIP.**

The CMP considers the benefits of greenhouse gas reductions in the Land Use Analysis Program and in developing the CIP. The 2019 CMP continues to include the Alameda County Priority Development Area Investment and Growth Strategy recommendations and options for alternative trip-generation rates to promote infill development in the Land Use Analysis Program that will help support the reduction of VMT and greenhouse gas emissions.

Future Considerations

The 2019 CMP update provides recommendations for next steps in addressing issues related to new and existing legislative requirements, monitoring standards, and other efforts related to congestion management and better integrating transportation and land use. Detailed next steps are included at the end of each individual chapter. Key follow-up areas for consideration are identified below. Alameda CTC will strive to develop future CMPs that improve multimodal mobility, quality of life, and the environment through better land use and transportation integration and by promoting alternative transportation modes for GHG reduction.

1. **Legislative efforts for CMP reform**

As discussed earlier, the updated CEQA guidelines resulting from SB 743 legislation implementation impacts the scope of the CMP.SB 743 was signed into law in 2013 and modified the metric used to measure the land development impacts on the transportation system in the CEQA process from a delay-based metric such as LOS to VMT. This is in direct conflict with the current CMP that requires use of LOS as the performance metric in two of its elements. Alameda CTC actively participated

in this process by leading the Bay Area SB743 Working Group to inform the SB 743 implementation process. Alameda CTC will also continue to work with other CMAs in the region and regional partners to be proactive and inform the development of bills related to CMP legislation amendment, so that the resulting CMP is more meaningful while supporting environmental goals at all levels of government. Based on the legislative outcomes, Alameda CTC's CMP will be modified to align with the new legislative requirements while continuing to be a forward-looking program.

2. **Improving the land use and transportation connection in Alameda County and implementing SB 375**

Alameda CTC will continue to use the Priority Development Area Investment and Growth Strategy to encourage development in the county's PDAs and support alternative transportation modes.

3. **Mitigating impacts on cross-county corridors or long corridors traversing multiple jurisdictions**

Currently, the CMP Land Use Analysis Program does not have a mechanism in place for "fair share" contributions for projects that would impact long travel or cross-county corridors that traverse several Alameda County jurisdictions. Creative options could be explored in identifying a "fair share" contribution.

Congestion Management Program Legislation

Government Code Section 65088—65089.10

65088

The Legislature finds and declares all of the following:

(a) Although California's economy is critically dependent upon transportation, its current transportation system relies primarily upon a street and highway system designed to accommodate far fewer vehicles than are currently using the system.

(b) California's transportation system is characterized by fragmented planning, both among jurisdictions involved and among the means of available transport.

(c) The lack of an integrated system and the increase in the number of vehicles are causing traffic congestion that each day results in 400,000 hours lost in traffic, 200 tons of pollutants released into the air we breathe, and three million one hundred thousand dollars ($3,100,000) added costs to the motoring public.

(d) To keep California moving, all methods and means of transport between major destinations must be coordinated to connect our vital economic and population centers.

(e) In order to develop the California economy to its full potential, it is intended that federal, state, and local agencies join with transit districts, business, private and environmental interests to develop and implement comprehensive strategies needed to develop appropriate responses to transportation needs.

(f) In addition to solving California's traffic congestion crisis, rebuilding California's cities and suburbs, particularly with affordable housing and more walkable neighborhoods, is an important part of accommodating future increases in the state's population because homeownership is only now available to most Californians who are on the fringes of metropolitan areas and far from employment centers.

(g) The Legislature intends to do everything within its power to remove regulatory barriers around the development of infill housing, transit-oriented development, and mixed use commercial development in order to reduce regional traffic congestion and provide more housing choices for all Californians.

(h) The removal of regulatory barriers to promote infill housing, transit-oriented development, or mixed use commercial development does not preclude a city or county from holding a public hearing nor finding that an individual infill project would be adversely impacted by the surrounding environment or transportation patterns.

(Amended by Statutes 2002, Ch. 505, Sec. 1. Effective January 1, 2003.)

65088.1.

As used in this chapter the following terms have the following meanings:

(a) Unless the context requires otherwise, “agency” means the agency responsible for the preparation and adoption of the congestion management program.

(b) “Bus rapid transit corridor” means a bus service that includes at least four of the following attributes:

(1) Coordination with land use planning.

(2) Exclusive right-of-way.

(3) Improved passenger boarding facilities.

(4) Limited stops.

(5) Passenger boarding at the same height as the bus.

(6) Prepaid fares.

(7) Real-time passenger information.

(8) Traffic priority at intersections.

(9) Signal priority.

(10)Unique vehicles.

(c) "Commission" means the California Transportation Commission.

(d) "Department" means the Department of Transportation.

(e) "Infill opportunity zone" means a specific area designated by a city or county, pursuant to subdivision (c) of Section 65088.4, that is within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3 of the Public Resources Code, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

(f) "Interregional travel" means any trips that originate outside the boundary of the agency. A "trip" means a one-direction vehicle movement. The origin of any trip is the starting point of that trip. A roundtrip consists of two individual trips.

(g) "Level of service standard" is a threshold that defines a deficiency on the congestion management program highway and roadway system which requires the preparation of a deficiency plan. It is the intent of the Legislature that the agency shall use all elements of the program to implement strategies and actions that avoid the creation of deficiencies and to improve multimodal mobility.

(h) "Local jurisdiction" means a city, a county, or a city and county.

(i) "Multimodal" means the utilization of all available modes of travel that enhance the movement of people and goods, including, but not limited to, highway, transit, nonmotorized, and demand management strategies including, but not limited to, telecommuting. The availability and practicality of specific multimodal systems, projects, and strategies may vary by county and region in accordance with the size and complexity of different urbanized areas.

(j) (1) "Parking cash-out program" means an employer-funded program under which an employer offers to provide 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. "Parking subsidy" means the difference between the out-of-pocket amount paid by an employer on a regular basis in order 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.

(2) A parking cash-out program may include a requirement that employee participants certify that they will comply with guidelines established by the employer designed to avoid neighborhood parking problems, with a provision that employees not complying with the guidelines will no longer be eligible for the parking cash-out program.

(k) "Performance measure" is an analytical planning tool that is used to quantitatively evaluate transportation improvements and to assist in determining effective implementation actions, considering all modes and strategies. Use of a performance measure as part of the program does not trigger the requirement for the preparation of deficiency plans.

(l) "Urbanized area" has the same meaning as is defined in the 1990 federal census for urbanized areas of more than 50,000 population.

(m) Unless the context requires otherwise, "regional agency" means the agency responsible for preparation of the regional transportation improvement program.

(Amended by Statutes 2013, Ch. 386, Sec. 3. (SB 743) Effective January 1, 2014.)

65088.3.

This chapter does not apply in a county in which a majority of local governments, collectively comprised of the city councils and the county board of supervisors, which in total also represent a majority of the population in the county, each adopt resolutions electing to be exempt from the congestion management program.

(Added by Statutes 1996, Ch. 293, Sec. 4. Effective January 1, 1997.)

65088.4.

(a) It is the intent of the Legislature to balance the need for level of service standards for traffic with the need to build infill housing and mixed use commercial developments within walking distance of mass transit facilities, downtowns, and town centers and to provide greater flexibility to local governments to balance these sometimes competing needs.

(b) Notwithstanding any other provision of law, level of service standards described in Section 65089 shall not apply to the streets and highways within an infill opportunity zone.

(c) The city or county may designate an infill opportunity zone by adopting a resolution after determining that the infill opportunity zone is consistent with the general plan and any applicable specific plan, and is a transit priority area within a sustainable communities strategy or alternative planning strategy adopted by the applicable metropolitan planning organization.

(Amended by Statutes 2013, Ch. 386, Sec. 4. (SB 743) Effective January 1, 2014.)

65088.5.

Congestion management programs, if prepared by county transportation commissions and transportation authorities created pursuant to Division 12 (commencing with Section 130000) of the Public Utilities Code, shall be used by the regional transportation planning agency to meet federal requirements for a congestion management system, and shall be incorporated into the congestion management system.

(Added by Statutes 1996, Ch. 1154, Sec. 4. Effective September 30, 1996.)

65089.

(a) A congestion management program shall be developed, adopted, and updated biennially, consistent with the schedule for adopting and updating the regional transportation improvement program, for every county that includes an urbanized area, and shall include every city and the county. The program shall be adopted at a noticed public hearing of the agency. The program shall be developed in consultation with, and with the cooperation of, the transportation planning agency, regional transportation providers, local governments, the department, and the air pollution control district or the air quality management district, either by the county transportation commission, or by another public agency, as designated by resolutions adopted by the county board of supervisors and the city councils of a majority of the cities representing a majority of the population in the incorporated area of the county.

(b) The program shall contain all of the following elements:

(1) (A) Traffic level of service standards established for a system of highways and roadways designated by the agency. The highway and roadway system shall include at a minimum all state highways and principal arterials. No highway or roadway designated as a part of the system shall be removed from the system. All new state highways and principal arterials shall be designated as part of the system, except when it is within an infill opportunity zone. Level of service (LOS) shall be measured by Circular 212, by the most recent version of the Highway Capacity Manual, or by a uniform methodology adopted by the agency that is consistent with the Highway Capacity Manual. The determination as to whether an alternative method is consistent with the Highway Capacity Manual shall be made by the

regional agency, except that the department instead shall make this determination if either (i) the regional agency is also the agency, as those terms are defined in Section 65088.1, or (ii) the department is responsible for preparing the regional transportation improvement plan for the county.

(B) In no case shall the LOS standards established below the level of service E or the current level, whichever is farthest from level of service A except when the area is in an infill opportunity zone. When the level of service on a segment or at an intersection fails to attain the established level of service standard outside an infill opportunity zone, a deficiency plan shall be adopted pursuant to Section 65089.4.

(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).

(3) 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 during the development and update of the travel demand element.

(4) A program to analyze the impacts of land use decisions made by local jurisdictions on regional transportation systems, including an estimate of the costs associated with mitigating those impacts. This program shall measure, to the extent possible, the impact to the transportation system using the performance measures described in paragraph (2). In no case shall the program include an estimate of the costs of mitigating the impacts of interregional travel. The program shall provide credit for local public and private contributions to improvements to regional transportation systems. However, in the case of toll road facilities, credit shall only be allowed for local public and private contributions which are unreimbursed from toll revenues or other state or federal sources. The agency shall calculate the amount of the credit to be provided. The program defined under this section may require implementation through the requirements and analysis of the California Environmental Quality Act, in order to avoid duplication.

(5) A seven-year capital improvement program, developed using the performance measures described in paragraph (2) to determine effective projects that maintain or improve the performance of the multimodal system for the movement of people and goods, to mitigate regional transportation impacts identified pursuant to paragraph (4). The program shall conform to transportation-related vehicle emission air quality mitigation measures, and include any project that will increase the capacity of the multimodal system. It is the intent of the Legislature that, when roadway projects are identified in the program, consideration be given for maintaining bicycle access and safety at a level comparable to that which existed prior to the improvement or alteration. The capital improvement program may also include safety, maintenance, and rehabilitation projects that do not enhance the capacity of the system but are necessary to preserve the investment in existing facilities.

(c) The agency, in consultation with the regional agency, cities, and the county, shall develop a uniform data base on traffic impacts for use in a countywide

transportation computer model and shall approve transportation computer models of specific areas within the county that will be used by local jurisdictions to determine the quantitative impacts of development on the circulation system that are based on the countywide model and standardized modeling assumptions and conventions. The computer models shall be consistent with the modeling methodology adopted by the regional planning agency. The data bases used in the models shall be consistent with the data bases used by the regional planning agency. Where the regional agency has jurisdiction over two or more counties, the data bases used by the agency shall be consistent with the data bases used by the regional agency.

(d) (1) The city or county in which a commercial development will implement a parking cash-out program that is included in a congestion management program pursuant to subdivision (b), or in a deficiency plan pursuant to Section 65089.4, shall grant to that development an appropriate reduction in the parking requirements otherwise in effect for new commercial development.

(2) At the request of an existing commercial development that has implemented a parking cash-out program, the city or county shall grant an appropriate reduction in the parking requirements otherwise applicable based on the demonstrated reduced need for parking, and the space no longer needed for parking purposes may be used for other appropriate purposes.

(e) Pursuant to the federal Intermodal Surface Transportation Efficiency Act of 1991 and regulations adopted pursuant to the act, the department shall submit a request to the Federal Highway Administration Division Administrator to accept the congestion management program in lieu of development of a new congestion management system otherwise required by the act.

(Amended by Statutes 2002, Ch. 505, Sec. 4. Effective January 1, 2003.)

65089.1.

(a) For purposes of this section, "plan" means a trip reduction plan or a related or similar proposal submitted by an employer to a local public agency for adoption or approval that is designed to facilitate employee ridesharing, the use of public transit, and other means of travel that do not employ a single-occupant vehicle.

(b) An agency may require an employer to provide rideshare data bases; an emergency ride program; a preferential parking program; a transportation information program; a parking cash-out program, as defined in subdivision (f) of Section 65088.1; a public transit subsidy in an amount to be determined by the employer; bicycle parking areas; and other noncash value programs which encourage or facilitate the use of alternatives to driving alone. An employer may offer, but no agency shall require an employer to offer, cash, prizes, or items with cash value to employees to encourage participation in a trip reduction program as a condition of approving a plan.

(c) Employers shall provide employees reasonable notice of the content of a proposed plan and shall provide the employees an opportunity to comment prior to submittal of the plan to the agency for adoption.

(d) Each agency shall modify existing programs to conform to this section not later than June 30, 1995. Any plan adopted by an agency prior to January 1, 1994, shall remain in effect until adoption by the agency of a modified plan pursuant to this section.

(e) Employers may include disincentives in their plans that do not create a widespread and substantial disproportionate impact on ethnic or racial minorities, women, or low-income or disabled employees.

(f) This section shall not be interpreted to relieve any employer of the responsibility to prepare a plan that conforms with trip reduction goals specified in

Division 26 (commencing with Section 39000) of the Health and Safety Code, or the Clean Air Act (42 U.S.C. Sec. 7401 et seq.).

(g) This section only applies to agencies and employers within the South Coast Air Quality Management District.

(Added by Statutes 1994, Ch. 534, Sec. 2. Effective January 1, 1995.)

65089.2.

(a) Congestion management programs shall be submitted to the regional agency. The regional agency shall evaluate the consistency between the program and the regional transportation plans required pursuant to Section 65080. In the case of a multicounty regional transportation planning agency, that agency shall evaluate the consistency and compatibility of the programs within the region.

(b) The regional agency, upon finding that the program is consistent, shall incorporate the program 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.

(c) (1) The regional agency shall not program any surface transportation program funds and congestion mitigation and air quality funds pursuant to Section 182.6 and 182.7 of the Streets and Highways Code in a county unless a congestion management program has been adopted by December 31, 1992, as required pursuant to Section 65089. No surface transportation program funds or congestion mitigation and air quality funds shall be programmed for a project in a local jurisdiction that has been found to be in nonconformance with a congestion management program pursuant to Section 65089.5 unless the agency finds that the project is of regional significance.

(2) Notwithstanding any other provision of law, upon the designation of an urbanized area, pursuant to the 1990 federal census or a subsequent federal census, within a county which previously did not include an urbanized area, a congestion management program as required pursuant to Section 65089 shall be adopted within a period of 18 months after designation by the Governor.

(d) (1) It is the intent of the Legislature that the regional agency, when its boundaries include areas in more than one county, should resolve inconsistencies and mediate disputes which arise between agencies related to congestion management programs adopted for those areas.

(2) It is the further intent of the Legislature that disputes which may arise between regional agencies, or agencies which are not within the boundaries of a multicounty regional transportation planning agency, should be mediated and resolved by the Secretary of Transportation, or an employee of the Transportation Agency designated by the secretary, in consultation with the air pollution control district or air quality management district within whose boundaries the regional agency or agencies are located.

(e) At the request of the agency, a local jurisdiction that owns, or is responsible for operation of, a trip-generating facility in another county shall participate in the congestion management program of the county where the facility is located. If a dispute arises involving a local jurisdiction, the agency may request the regional agency to mediate the dispute through procedures pursuant to subdivision (d). Failure to resolve the dispute does not invalidate the congestion management program.

(Amended by Statutes 2014, Ch. 345, Sec. 2. Effective January 1, 2015.)

65089.3.

The agency shall monitor the implementation of all elements of the congestion management program. The department is responsible for data collection and

analysis on state highways, unless the agency designates that responsibility to another entity. The agency may also assign data collection and analysis responsibilities to other owners and operators of facilities or services if the responsibilities are specified in its adopted program. The agency shall consult with the department and other affected owners and operators in developing data collection and analysis procedures and schedules prior to program adoption. At least biennially, the agency shall determine if the county and cities are conforming to the congestion management program, including, but not limited to, all of the following:

(a) Consistency with levels of service standards, except as provided in Section 65089.4.

(b) Adoption and implementation of a program to analyze the impacts of land use decisions, including the estimate of the costs associated with mitigating these impacts.

(c) Adoption and implementation of a deficiency plan pursuant to Section 65089.4 when highway and roadway level of service standards are not maintained on portions of the designated system.

(Amended by Statutes 1996, Ch. 293, Sec. 3. Effective January 1, 1997.)

65089.4.

(a) A local jurisdiction shall prepare a deficiency plan when highway or roadway level of service standards are not maintained on segments or intersections of the designated system. The deficiency plan shall be adopted by the city or county at a noticed public hearing.

(b) The agency shall calculate the impacts subject to exclusion pursuant to subdivision (f) of this section, after consultation with the regional agency, the department, and the local air quality management district or air pollution control district. If the calculated traffic level of service following exclusion of these impacts is consistent with the level of service standard, the agency shall make a finding at a publicly noticed meeting that no deficiency plan is required and so notify the affected local jurisdiction.

(c) The agency shall be responsible for preparing and adopting procedures for local deficiency plan development and implementation responsibilities, consistent with the requirements of this section. The deficiency plan shall include all of the following:

(1) An analysis of the cause of the deficiency. This analysis shall include the following:

(A) Identification of the cause of the deficiency.

(B) Identification of the impacts of those local jurisdictions within the jurisdiction of the agency that contribute to the deficiency. These impacts shall be identified only if the calculated traffic level of service following exclusion of impacts pursuant to subdivision (f) indicates that the level of service standard has not been maintained, and shall be limited to impacts not subject to exclusion.

(2) A list of improvements necessary for the deficient segment or intersection to maintain the minimum level of service otherwise required and the estimated costs of the improvements.

(3) A list of improvements, programs, or actions, and estimates of costs, that will (A) measurably improve multimodal performance, using measures defined in paragraphs (1) and (2) of subdivision (b) of Section 65089, and (B) contribute to significant improvements in air quality, such as improved public transit service and facilities, improved nonmotorized transportation facilities, high occupancy vehicle facilities, parking cash-out programs, and transportation control measures. The air quality management district or the air pollution control district shall establish and periodically revise a list of approved improvements, programs, and actions that meet the scope of this paragraph. If an improvement, program, or action on the approved list has not been fully implemented, it shall be deemed to contribute to significant improvements in air quality. If an

improvement, program, or action is not on the approved list, it shall not be implemented unless approved by the local air quality management district or air pollution control district.

(4) An action plan, consistent with the provisions of Chapter 5 (commencing with Section 66000), that shall be implemented, consisting of improvements identified in paragraph (2), or improvements, programs, or actions identified in paragraph (3), that are found by the agency to be in the interest of the public health, safety, and welfare. The action plan shall include a specific implementation schedule. The action plan shall include implementation strategies for those jurisdictions that have contributed to the cause of the deficiency in accordance with the agency's deficiency plan procedures. The action plan need not mitigate the impacts of any exclusions identified in subdivision (f). Action plan strategies shall identify the most effective implementation strategies for improving current and future system performance.

(d) A local jurisdiction 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 that 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 local jurisdiction of the reasons for that rejection, and the local jurisdiction shall submit a revised plan within 90 days addressing the agency's concerns. Failure of a local jurisdiction to comply with the schedule and requirements of this section shall be considered to be nonconformance for the purposes of Section 65089.5.

(e) The agency shall incorporate into its deficiency plan procedures, a methodology for determining if deficiency impacts are caused by more than one local jurisdiction within the boundaries of the agency.

(1) If, according to the agency's methodology, it is determined that more than one local jurisdiction is responsible for causing a deficient segment or intersection, all responsible local jurisdictions shall participate in the development of a deficiency plan to be adopted by all participating local jurisdictions.

(2) The local jurisdiction in which the deficiency occurs shall have lead responsibility for developing the deficiency plan and for coordinating with other impacting local jurisdictions. If a local jurisdiction responsible for participating in a multi-jurisdictional deficiency plan does not adopt the deficiency plan in accordance with the schedule and requirements of paragraph (a) of this section, that jurisdiction shall be considered in nonconformance with the program for purposes of Section 65089.5.

(3) The agency shall establish a conflict resolution process for addressing conflicts or disputes between local jurisdictions in meeting the multi-jurisdictional deficiency plan responsibilities of this section.

(f) The analysis of the cause of the deficiency prepared pursuant to paragraph (1) of subdivision (c) shall exclude the following:

(1) Interregional travel.

(2) Construction, rehabilitation, or maintenance of facilities that impact the system.

(3) Freeway ramp metering.

(4) Traffic signal coordination by the state or multi-jurisdictional agencies.

(5) Traffic generated by the provision of low-income and very low income housing.

(6) (A) Traffic generated by high-density residential development located within one-fourth mile of a fixed rail passenger station, and

(B) Traffic generated by any mixed use development located within one-fourth mile of a fixed rail passenger station, if more than half of the land area, or floor area, of the mixed use development is used for high density residential housing, as determined by the agency.

(g) For the purposes of this section, the following terms have the following meanings:

(1) "High density" means residential density development which contains a minimum of 24 dwelling units per acre and a minimum density per acre which is equal to or greater than 120 percent of the maximum residential density allowed under the local general plan and zoning ordinance. A project providing a minimum of 75 dwelling units per acre shall automatically be considered high density.

(2) "Mixed use development" means development which integrates compatible commercial or retail uses, or both, with residential uses, and which, due to the proximity of job locations, shopping opportunities, and residences, will discourage new trip generation.

(Added by Statutes 1994, Ch. 1146, Sec. 7. Effective January 1, 1995.)

65089.5.

(a) If, pursuant to the monitoring provided for in Section 65089.3, the agency determines, following a noticed public hearing, that a city or county is not conforming with the requirements of the congestion management program, the agency shall notify the city or county in writing of the specific areas of nonconformance. If, within 90 days of the receipt of the written notice of nonconformance, the city or county has not come into conformance with the congestion management program, the governing body of the agency shall make a finding of nonconformance and shall submit the finding to the commission and to the Controller.

(b) (1) Upon receiving notice from the agency of nonconformance, the Controller shall withhold apportionments of funds required to be apportioned to that nonconforming city or county by Section 2105 of the Streets and Highways Code.

(2) If, within the 12-month period following the receipt of a notice of nonconformance, the Controller is notified by the agency that the city or county is in conformance, the Controller shall allocate the apportionments withheld pursuant to this section to the city or county.

(3) If the Controller is not notified by the agency that the city or county is in conformance pursuant to paragraph (2), the Controller shall allocate the apportionments withheld pursuant to this section to the agency.

(c) The agency shall use funds apportioned under this section for projects of regional significance which are included in the capital improvement program required by paragraph (5) of subdivision (b) of Section 65089, or in a deficiency plan which has been adopted by the agency. The agency shall not use these funds for administration or planning purposes.

(Added by renumbering Section 65089.4 by Statutes 1994, Ch. 1146, Sec. 6. Effective January 1, 1995.)

65089.6.

Failure to complete or implement a congestion management program shall not give rise to a cause of action against a city or county for failing to conform with its general plan, unless the city or county incorporates the congestion management program into the circulation element of its general plan.

(Added by renumbering Section 65089.5 by Statutes 1994, Ch. 1146, Sec. 8. Effective January 1, 1995.)

65089.7.

A proposed development specified in a development agreement entered into prior to July 10, 1989, shall not be subject to any action taken to comply with this chapter, except actions required to be taken with respect to the trip reduction and travel demand element of a congestion management program pursuant to paragraph (3) of subdivision (b) of Section 65089.

(Added by renumbering Section 65089.6 by Statutes 1994, Ch. 1146, Sec. 9. Effective January 1, 1995.)

65089.9.

The study steering committee established pursuant to Section 6 of Chapter 444 of the Statutes of 1992 may designate at least two congestion management agencies to participate in a demonstration study comparing multimodal performance standards to highway level of service standards. The department shall make available, from existing resources, fifty thousand dollars ($50,000) from the Transportation Planning and Development Account in the State Transportation Fund to fund each of the demonstration projects. The designated agencies shall submit a report to the Legislature not later than June 30, 1997, regarding the findings of each demonstration project.

(Added by Statutes 1994, Ch. 1146, Sec. 11. Effective January 1, 1995.)

65089.10.

Any congestion management agency that is located in the Bay Area Air Quality Management District and receives funds pursuant to Section 44241 of the Health and Safety Code for the purpose of implementing paragraph (3) of subdivision (b) of Section 65089 shall ensure that those funds are expended as part of an overall program for improving air quality and for the purposes of this chapter.

(Added by Statutes 1995, Ch. 950, Sec. 1. Effective January 1, 1996.)

Alameda CTC Committees and Administration

Committees

The Alameda CTC Commission has five standing committees: the Finance and Administration Committee (FAC), the Goods Movement Planning Committee (GMPC), the Programs and Projects Committee (PPC), the Planning, Policy, and Legislation Committee (PPLC), and the Transit Planning Committee (TPC). Alameda CTC is also advised by the Alameda County Technical Advisory Committee (ACTAC).

Finance and Administration Committee

The functions and authority of the FAC are agency operations and performance; human resources and personnel policies and procedures; administrative code; salary and benefits; procurement policies and procedures; procurement of administrative contracts; contract preference programs for entities such as local business enterprises, small business enterprises and disabled business enterprises; bid protests and complaints related to administrative contract procurement; annual budget and financial reports; investment policy and reports; audit reports, financial reporting, internal controls and risk management; and the annual work program.

Goods Movement Planning Committee

The matters within the jurisdiction of the GMPC are goods-movement-specific plans and studies, beyond those addressed in the Planning, Policy and Legislation Committee; goods movement partnership and collaboration; goods movement-specific policy development; updates on Goods Movement Plan implementation from staff and other agencies; local, state and federal funding pertaining to goods movement projects and programs; and local, state and federal legislative issues pertaining to goods movement.

Programs and Projects Committee

The functions and authority of the PPC are local, state, congestion management agency Transportation Improvement Program (TIP), TFCA Vehicle Registration Fee (VRF) programs and Expenditure Plan programs and projects; local, state and federally funded projects and funding programs; the annual strategic plan for programs and projects; funding requests from project sponsors and other eligible recipients; paratransit services programs and projects; bicycle and pedestrian projects and programs; funding allocations to various transportation programs and projects; eminent domain proceedings; environmental evaluations; contract procurement; good faith efforts policies and procedures; and bid protests and complaints regarding engineering and construction contract procurement.

Planning, Policy, and Legislation Committee

The functions and authority of the PPLC are the Congestion Management Program; Countywide Transportation Plan; federal, state, regional and local transportation and land-use planning policies and studies; amendments to the 1986 Expenditure Plan or the 2000 Expenditure Plans; amendments to the VRF Expenditure Plan; transit-oriented development and priority development area projects and programs; the annual legislative program; state and federal legislative matters; general and targeted outreach programs; and advisory committee performance and effectiveness.

Transit Planning Committee

The matters within the jurisdiction of the TPC are transit-specific plans and studies, beyond those addressed in PPLC; transit-specific policy coordination; transit collaboration efforts with other agencies; updates on transit plan implementation from staff and other agencies; local, state and federal funding pertaining to transit; and local, state and federal legislative issues pertaining to transit.

Technical Advisory Committee

ACTAC functions as the technical advisory committee to the Alameda CTC. ACTAC is comprised of two staff representatives from each agency represented on the Commission (each city in Alameda County, the county, AC Transit, and BART) and one staff representative from each of the following agencies: Altamont Corridor Express, Alameda CTC, Association of Bay Area Governments, Bay Area Air Quality Management District, the California Department of Transportation, the California Highway Patrol, Livermore Amador Valley Transit Authority, the Metropolitan Transportation Commission (MTC), Port of Oakland, San Francisco Bay Area Water Emergency Transportation Authority, and Union City Transit. Alameda CTC's executive director chairs ACTAC.

Deficiency Plan Guidelines

Background and Purpose

Deficiency Plans include various measures to improve transportation conditions on a Congestion Management Program (CMP) roadway that does not meet the established CMP level of service standard set forth in the California Government Code Section 65089 (b)(1)(B). The state legislation requires:

> *In no case shall the LOS standards for roads established be below the LOS E or at the current level, whichever is further from LOS A. When the LOS on a segment or at an intersection fails to attain the established LOS standard, a Deficiency Plan shall be adopted pursuant to Section 65089.4.*

Deficiency Plans are a way for jurisdictions to remain in compliance with the CMP. Deficiency Plans should be developed with consideration of the countywide transportation planning process, including forecasts of travel needs and planned capital improvements. Likewise, existing deficiencies should influence future countywide transportation planning and programming decisions. If the Deficiency Plan involves system-wide improvements, Alameda CTC staff, transit agencies, the Bay Area Air Quality Management District (BAAQMD), and the California Department of Transportation may also be involved.

Process Overview

When the LOS on a given CMP-network segment deteriorates below the established state standard, the responsible jurisdictions(s) must prepare a Deficiency Plan, or additional gasoline tax subventions (pursuant to Section 2105 of the Streets and Highways Code) will be withheld. During even number years, when the LOS Monitoring is performed, the Alameda CTC Commission determines whether a jurisdiction is required to prepare a Deficiency Plan based on the LOS Monitoring results. If any CMP segment is identified to be deficient, the respective jurisdiction(s) must prepare a Deficiency Plan within 12 months of the determination to prevent its forfeiting of additional gasoline tax subventions. Pages 5-8 herein include the relevant sections of the CMP legislation related to the Deficiency Plan requirements.

Deficiency Identification

Biennially, the Alameda CTC identifies potentially deficient roadway segments based on LOS monitoring. Only trips originating inside Alameda County in the p.m. peak period are included in determining LOS conformity with the established LOS standard exempting many types of travel. After applying the required exemptions, if a CMP roadway segment is still found to operate at LOS F, it will be determined as deficient and the respective local jurisdiction(s) will be informed.

Exemptions

The State statute requires several types of travel to be exempted from the deficiency determination, including:

- Interregional travel;
- Construction, rehabilitation, or maintenance of facilities that impact the system;
- Freeway ramp metering;
- Traffic signal coordination by the state or a multi-jurisdictional agency;
- Traffic generated by the provision of low and very low income housing;
- Traffic generated by high-density residential development within one-fourth mile of a fixed rail passenger station; and
- Traffic generated by any mixed use development located within one-fourth mile of a fixed rail passenger station; and if more than half of the land area or floor area of the mixed use development is used for high density residential housing.

Roadway Capacity Standards

For the purposes of determining deficiency, the following standards for roadway capacity will be used unless a local jurisdiction can demonstrate an alternative capacity:

- Freeways: 2,000 vehicles per lane per hour
- Two-lane: 1,400 vehicles per lane per hour highways
- Arterials: 800 vehicles per lane per hour

Jurisdictional Participation

If a deficient CMP roadway segment is located entirely in one jurisdiction and all other jurisdictions contribute less than 10% traffic, then the deficiency should be addressed through a local single-jurisdiction deficiency plan. However, if a deficient CMP roadway segment crosses jurisdiction boundaries, borders two jurisdictions, or if the following conditions are met that are considered to be contributing to the deficiency or for effective planning purposes, then the deficiency should be addressed through a multi-jurisdictional deficiency plan.

- A jurisdiction shall participate in a deficiency plan if traffic to or from that jurisdiction, either an origin or destination at the deficient segment, represents ten percent (10 percent) of the capacity of the freeway/roadway, as estimated by the countywide travel demand model.
- In some cases, (in order to eliminate any gaps and to ensure continuity in the planning process) a jurisdiction that does not meet the 10 percent threshold shall be required to participate in the deficiency plan process if it is surrounded by jurisdictions which meet the threshold for participation.

Additional features of the multi-jurisdictional deficiency plan in terms of participation are:

- All owners/operators of a deficient segment of freeway or roadway along with transit operators shall be invited to participate in the deficiency plan process.
- The percent contribution of traffic specifically does not imply a commensurate financial share of the Deficiency Plan actions identified.
- All participating jurisdictions shall adopt identical deficiency plan action plans. A local jurisdiction shall have the right to appeal as depicted in the Multi-jurisdictional Deficiency Plan Appeal Process, (Figure D1) or to invoke the established Conflict Resolution Process to address conflicts or disputes that arise between the local jurisdictions in developing the multi-jurisdictional Deficiency Plan.
- If a local jurisdiction responsible for participating in a multi-jurisdictional deficiency plan does not adopt the deficiency plan in accordance with the schedule and requirements outlined above, that jurisdiction shall be considered in non-conformance with the CMP.

Types of Deficiency Plans

The Deficiency Plan process allows a local jurisdiction to choose one of two types of Deficiency Plans.

Localized Deficiency Plan

This type of plan is appropriate for addressing transportation impacts to a single CMP segment or roadway that has been identified as or is anticipated to become deficient based on the LOS Monitoring. This plan focuses on analyzing the cause of deficiency by including the immediate surrounding area as the project area and identifying the list of improvements or mitigation measures that are necessary to meet LOS standards, and estimates the costs and implementation schedule of the proposed improvements.

Areawide Deficiency Plan

An Areawide Deficiency Plan is appropriate when a CMP segment or roadway has been identified as or is anticipated to become deficient based on the LOS Monitoring and it cannot be improved to meet LOS standards and mitigated back to conformance if considered solely within a localized area. The jurisdiction must designate the segment as deficient, and develop and implement actions to measurably improve the

performance of the larger network LOS in the study area and contribute to significant air quality improvements. Such actions may not necessarily directly pertain to or have a measurable impact on the deficient segment itself but must show system-wide improvement. This plan focuses on offsetting the deficiency by including the broader surrounding area as the project area and identifying a list of improvements, programs or actions to improve the performance of the larger multimodal network. The plan should contain an estimate of the costs and implementation schedule of the proposed improvements, programs or actions.

The study area for an Areawide Deficiency Plan should generally be an area where improvements made to the multimodal network in one place of the study area provide improved overall performance of the larger network in that area. The study area should include or be served by one or more alternative transportation modes. The study area can be:

- An administrative jurisdiction such as a city/county or a part of a city/county
- An area comprising parts of multiple adjacent jurisdictions in which case it will be a multi-jurisdiction deficiency plan

Plan Development and Approval

Required Components

The scope of a Deficiency Plan should match the severity of the problem. Extreme deficiencies will need more significant actions. Action plans must be incorporated into future CMP documents. State law requires a Deficiency Plan contain the following:

- an analysis of the deficiency
- a list of improvements and related costs to mitigate the deficiency in that facility itself;
- a list of possible actions and costs that would result in improvements to the CMP system's LOS and be beneficial to air quality; and
- an action plan, including a schedule, to implement improvements from one of the two above lists.

In developing the deficiency plan addressing the required components, the following format should be used:

- Introduction and Setting. A short description of the facility, including a map showing its location.
- Deficiency Analysis. Analysis and assessment of deficiency in terms of likely causes and the magnitude.
- Screening of Actions. An array of suitable actions evaluated at a sketch-planning level for potential effects on system-wide traffic congestion and air quality (traffic operations analyses or model forecasts may be required). For this purpose, actions listed in the BAAQMD guidelines (described in more detail in the following section) and other actions identified and approved by the BAAQMD should be used.
- Evaluation of Suitable Actions. Selected actions from the screening process further evaluated to demonstrate how these actions when implemented contribute to improving the CMP network LOS conditions.
- Implementation. A detailed implementation plan should be developed, including description of the selected actions, anticipated costs, related funding sources and schedule.

Suitable Implementation Actions

Implementation actions fall into one of two categories:

- Mitigation of Deficiency. These types of improvements are designed to directly mitigate the specific deficiency such as highway, transit and other mode improvements, typically included in the localized deficiency plan.
- Overall System Performance and Air Quality Improvement. These actions are intended to provide overall measurable improvements to system performance and air quality, in cases where deficiencies cannot be mitigated directly.

This will occur from implementing an areawide deficiency plan.

Areawide deficiency plans facilitate implementation of coordinated improvements to the multimodal transportation network and promote reduction of overall percentage of trips made by the single occupant vehicles while increasing the percentage of trips made by transit, pedestrian and bicycle and resulting in improvements to air quality. For these types of plans, the legislation requires identifying an array of actions improving multimodal performance. In addition, the legislation requires the air quality management district, which is Bay Area Air Quality Management District (BAAQMD) for the Bay Area, to develop a list of improvements, programs and actions for this purpose as follows:

> *The deficiency plan shall include….a list of improvements, programs, or actions, and estimates of costs, that will (A) measurably improve multimodal performance, using measures defined in paragraphs (1) and (2) of subdivision (b) of Section 65089, and (B) contribute to significant improvements in air quality, such as improved public transit service and facilities, improved nonmotorized transportation facilities, high occupancy vehicle facilities, parking cash-out programs, and transportation control measures. The air quality management district or the air pollution control district shall establish and periodically revise a list of approved improvements, programs, and actions that meet the scope of this paragraph. If an improvement, program, or action on the approved list has not been fully implemented, it shall be deemed to contribute to significant improvements in air quality. If an improvement, program, or action is not on the approved list, it shall not be implemented unless approved by the local air quality management district or air pollution control district.*

The BAAQMD has developed a list of actions which are considered beneficial for air quality and congestion management. The list includes measures to improve use of alternative modes, which will improve traffic flow and reduce trips. Jurisdictions may include actions other than those on this list, provided the BAAQMD reviews and approves the list prior to plan adoption. The most current BAAQMD list of actions should always be consulted.

In addition, the proposed improvement measures and actions for the Action Plan of the Deficiency Plan in Alameda County can be coordinated with the outcome of the upcoming countywide modal plans – (i.e., Countywide Goods Movement Plan, Countywide Transit Plan, and Countywide Multimodal Arterial Corridor Mobility Plan) and the adopted Comprehensive Countywide Travel Demand Management (TDM) Strategy to effectively improve the multimodal transportation network performance. This could support measures including but not limited to the potential improvement measures related to the priority transit routes, bicycle and pedestrian locations, priority roadways, and freight as identified in the modal plans. Alameda CTC will develop a list of multimodal improvement measures based on the outcome of these modal plans and work with the Air District to get their approval, so that more improvement options are readily available should an areawide deficiency plan be required.

Review and Evaluation

An acceptable Deficiency Plan will contain all of the required components listed above and will be evaluated on the following technical criteria:

- Completeness as required in California Government Code Section 65089.5;
- Appropriateness of the Deficiency Plan actions in relation to the magnitude of the deficiency;
- Reliability of the funding sources;
- Ability to implement the proposed actions (including jurisdictional control issues); and

- Reasonableness of the implementation plan schedule.

Alameda CTC staff and ACTAC members will review the draft Deficiency Plan and provide technical input to assist the respective local jurisdiction(s) in developing and finalizing the Deficiency Plan.

Adoption

A final plan must be adopted by the affected local jurisdiction(s) at a noticed public hearing no later than 12 months following identification of Deficiency by Alameda CTC. The Alameda CTC Commission will approve or reject a Deficiency Plan within 60 days of receipt of the Deficiency Plan from the local jurisdiction(s). If the plan is rejected, Alameda CTC will notify the local jurisdiction(s) of the reasons for that rejection, and the local jurisdiction must submit a revised plan within 90 days. Once a plan is adopted, written notification of the conformance findings of the Alameda CTC Commission (presently scheduled to occur at the November/December Alameda CTC Commission meeting) is required annually.

Updates

To facilitate the implementation process, the Alameda CTC Commission will accept minor updates to Deficiency Plans. The affected jurisdictions(s) may submit a notice to the Alameda CTC stating the reason for and content of the update. The Alameda CTC Commission will approve or reject the request for the update. Should the Alameda CTC Commission reject the request, the existing Deficiency Plan will remain in place.

Monitoring

Annually, the Alameda CTC will monitor implementation of the Deficiency Plans prior to the annual conformance determination, to establish whether:

- They are being executed according to the schedule detailed in the implementation plan; or
- Changes have occurred that require modifications of the original Deficiency Plan or schedule.

Jurisdictions that have prepared and are implementing a Deficiency Plan must prepare annual status report updates for the Annual Conformity Findings. Participating jurisdictions that did not prepare the Deficiency Plan must also review the annual status report updates and submit a letter to the Alameda CTC stating they are in concurrence with the annual update from the lead jurisdiction. This information is required for the Commission to make a determination whether the jurisdictions are in conformance with the CMP.

Compliance

A deficiency plan can be considered fully implemented, if the local jurisdiction determines and Alameda CTC concurs that the implementation of the deficiency plan resulted in a measurable improvement in LOS, bringing the formerly deficient segments into compliance with the LOS standards. For deficiency plans that include both near-term and long-term actions, if completion of the near-term actions resulted in a measurable improvement in LOS, and has demonstrated compliance with LOS standards for at least five years, Alameda CTC and the local jurisdiction may consider implementation of the deficiency plan to be complete without the completion of the long-term actions.

A jurisdiction (lead or participating), which is either not implementing the actions or not adhering to the stated schedule in the approved Deficiency Plan may be found in non-conformance, if the deficiency still exists. The detailed process for finding of non-conformance and the resulting withholding of Proposition 111 funds is described in Chapter 9.

California Code Sections 65089.4 and 65089.5 Regarding the Congestion Management Program Deficiency Plan Process

Refer to Appendix A for the most recent CMP legislation regarding the CMP deficiency plan process.

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Assessment of HCM2010 and MMLOS

D.1—Assessment of HCM2010

Background

Alameda CTC, as a Congestion Management Agency (CMA), must prepare a Congestion Management Program biennially.

Two required CMP elements—level of service (LOS) monitoring and the Land Use Analysis Program—use Highway Capacity Manual (HCM) methodologies. These methodologies and measures are anticipated to be changed soon to be in line with the SB 743 related requirements. This assessment is a documentation of analyses and tests performed in applying various versions of HCM methods in order to identify and recommend what works for the implementation of these two CMP elements.

Overview of Current CMP Practice

	Auto	Other Modes
LOS Monitoring	Track LOS on CMP network using HCM1985	Limited study of transit travel times and bicycle counts
Lan Use Analysis Program	Require study of roadway segments using HCM2000 in Transportation Impact Analyses (TIAs)	Require analysis of impacts on transit operators in TIAs

What Is New in the HCM2010?

- Updated auto LOS methodologies
- Multimodal LOS (MMLOS)—ability to assign LOS letter grades for transit, bicyclists, and pedestrians, based on quality of user experience.

Why Investigate HCM2010 Adoption?

The 2011 CMP recommended investigating use of HCM 2010 as a key next step. This recommendation was motivated by three considerations:

- *Legislative mandate*—The CMP statute advises CMAs to use the most recent HCM in LOS monitoring activities.
- *Regional guidance*—MTC's CMP guidance encourages use of the HCM 2010.
- *Increasing multimodal focus*—There is interest in whether HCM 2010's MMLOS techniques were suitable for CMP applications.

Assessment Activities

Staff conducted a technical evaluation of HCM 2010 including:

- Comparing the inputs required to assign auto LOS in the 1985, 2000, and 2010 HCMs.
- Sensitivity testing of how HCM2010 MMLOS grades respond to key inputs using a spreadsheet model
- Consultation with other CMAs regarding plans for use of HCM2010 (both auto LOS and MMLOS)

Assessment Findings

Auto LOS	HCM2010 MMLOS
• Cannot assign freeway segment LOS based on speed post-HCM1985 • Arterial segment free flow speed classifications change after HCM 1985 • New data needed for arterials in HCM2010—okay for project-level application, but excessive for larger scale use	• Strong at illustrating effects of roadway design changes • Grades not strongly sensitive to operational changes (e.g., speed for transit or vehicle volumes for bike/ped) • Can be difficult to tell why scores change • Very data-intensive

Considerations for recommendations

- *Current and future data availability (auto LOS)*: Can the methodology be applied with data available? Is it cost-effective/feasible to collect the data? What about future data collection methods?
- *Ability to track trends (auto LOS)*: Would the new methodology enable results to be compared to pre-vious years (e.g., to assess CMP conformance in LOS).
- *Suitability (MMLOS)*: Does the methodology respond to the appropriate parameters (will it show change from year-to-year or from no project-to-project)?

Recommendations

	Auto	Other Modes
LOS Monitoring	• Continue to use HCM1985 for deficiency purpose • Apply HCM 2000 and 1985 to Tier 2 arterials to make determination on future application in the upcoming CMP update cycle	• Leverage modal plans to develop networks and metrics for enhanced multimodal monitoring
Land Use Analysis Program	• Encourage use of HCM 2010 to study segment impacts; permit flexibility if analysts need to con-form to local requirements	• Adopt more robust language describing types of impacts to transit, bicyclists, and pedestrians to be considered • Encourage use of MMLOS to evaluate multimodal tradeoffs from mitigation measures

Table D.1—Rationale for Recommended Use of HCM2010 for LOS Monitoring

Auto		Other Modes	
Recommendation	**Reasons for recommendation**	**Recommendation**	**Reasons for recommendation**
Continue to use HCM 1985 for deficiency purposes	• Change of methodology would result in loss of ability to track trends (and CMP conformance) • Post-1985 HCM freeway segment methodology not compatible with current (GPS-floating car) and possible future (commercially collected) data collection methods which provide speed data (LOS methodology based on density).	Leverage modal plans outcome to develop networks and metrics for enhanced multimodal monitoring	• Modal plans provide opportunity to look at ways to monitor critical network and metrics for non-auto modes (e.g., speed and reliability of key lines for transit) • HCM 2010 MMLOS mostly responds to changes in schedule (for transit) or roadway design (for bike and ped) but these do not change greatly from year-to-year • Would not be clear why HCM 2010 MMLOS grades change if multiple input variables change at the same time (black box)
Apply HCM 1985 and 2000 to Tier 2 arterials and make a determination on future application in the upcoming CMP update cycle	• No new data needed • New CMP roadways and no LOS estimated yet, so can be applied to 2012 and 2014 monitoring results • Monitored only for infor-mational purposes, so no conformity issue • Provides opportunity to compare results based on different methodologies, and determine future application		

Table D.2—Rationale for Recommended Use of HCM 2010 for Land Use Analysis Program

Auto		Other Modes	
Recommendation	**Reasons for recommendation**	**Recommendation**	**Reasons for recommendation**
Encourage use of HCM 2010 to study segment impacts; permit flexibility if analysts need to conform to local requirements	• No change in data needs for freeway segments; additional data needs for arterials within scope of what is generally collected for TIAs	Adopt more robust language describing types of impacts to transit, bicyclists, and pedestrians to be considered	• HCM 2010 MMLOS is not strong at illustrating how transit, bicyclists, or pedestrians are affected by operational changes; for many projects, the primary impact to these modes is via increased project vehicle traffic
		Encourage use of HCM 2010 MMLOS to evaluate multimodal tradeoffs from mitigation measures	• HCM 2010 MMLOS is strong at illustrating modal tradeoffs from design changes (e.g., adding a turn pocket or retiming a signal) • Most TIAs propose mitigation measures for only a few segments, so scope of application would be limited

D.2—Approach to Use of HCM2010 and MMLOS at Other CMAs

Detailed information follows on other comparable Bay Area CMAs' (San Francisco County Transportation Authority, Valley Transportation Authority, and Contra Costa Transportation Authority) current and future plans for use of HCM methodologies in their CMPs. Specifically, information is provided on:

- Use of HCM 2010 for the auto based roadway LOS methodology
  - As part of LOS monitoring activities, since adoption of HCM 2010 is related to current and future plans for data collection
  - As a required methodology to study auto impacts in Transportation Impact Analyses reviewed for Land Use Analysis element
- Use of MMLOS methodologies
  - To provide increased monitoring for alternative modes in the LOS monitoring
  - As part of the guidelines for Transportation Impact Analyses reviewed for the land use analysis element

HCM 2010 Application for Auto-Based Roadway LOS

Table D.3—Other CMA Approaches to Applying HCM Auto-based Roadway LOS Methodology for LOS Monitoring Data Collection

	SFCTA	VTA	CCTA	Alameda CTC
Data Collection	• Historically: GPS-based floating car runs • 2013 onwards: private, commercially available data (speed)	• Historically: Aerial photography • Testing in 2014: Private, commercially available data (speed) and PeMS data (flow)	• Historically: GPS-based floating car runs, PeMS • 2013 onwards: PeMS, private, commercially available (Bluetooth™) data (speed)	• Currently: GPS-based floating car runs • Interest in testing private, commercially available data (speed)
Freeway HCM Methodology (Auto)	• HCM 1985 (decided in 2011 CMP to continue to use speed as the LOS measure based on 1985 HCM to maintain historical comparisons, monitor exempt segments and identify potential deficiencies)	• HCM 2000 (since density data was collected historically, it was easy to move to using HCM 2000) • Testing in 2014—use of HCM 2010.	• Historically: HCM 1985 • Currently testing HCM 2010	• Currently: HCM 1985 • Proposed: maintain HCM 1985
Arterial HCM Methodology (Auto)	• HCM 1985 for deficiency purposes • HCM 2000 for informational purposes (segments)	• HCM 2000 (intersections) • Testing in 2014—HCM 2010 (intersections)	• Historically: CCTALOS (planning method based on Circular 212) • Currently testing HCM 2010 (HCM 2000 used at intersections where configuration does not allow use of HCM 2010)	• Currently: HCM 1985 • Proposed: maintain HCM 1985

Table D.4—Other CMA Approaches to Applying HCM Auto-based Roadway LOS Methodology for Land Use Analysis Program Data Collection Related to Transportation Impact Analysis

	San Francisco Planning Department*	VTA	CCTA	Alameda CTC
Freeway	• HCM 2000	• Current: HCM 2000 • Under consideration: HCM 2010	• HCM 2010	• Current: HCM 2000 • Proposed: HCM 2010 encouraged
Non freeway	• HCM 2000 (intersections)	• Current: HCM 2000 (intersections) • Under consideration: HCM 2010 (intersections)	• HCM 2010 (intersections)	• Current: HCM 2000 (segments) • Proposed: HCM 2010 encouraged

* San Francisco's Planning Department reviews Traffic Impact Analyses on behalf of the CMA; however, considerations may be different as this review serves as both a city- and CMA-level review.

Table D.5—Other CMA Approaches to Applying HCM 2010 MMLOS for LOS Monitoring

	SFCTA	VTA	CCTA	Alameda CTC
Overall	• No plans to adopt MMLOS	• Pilot analysis of MMLOS bike/ped methodologies	• Exploring applying multimodal LOS measures that may not be HCM 2010 MMLOS as part of Action Plan update	• Current: Limited multimodal reporting in LOS monitoring; extensive countywide multimodal reporting in Performance Report
Transit	• Report on transit travel time; exploring report-ing on transit reliability measures; utilizing data obtained from SFMTA APC and AVL units	• No facility-specific reporting • Exploring use of big data approach to study transit speed, reliability, and causes of delay on key corridors	• As above	• Proposed: Use countywide modal studies to identify monitoring network, metrics, and data sources
Bike/Ped	• No facility specific reporting • Report on bike/ped counts, network build-out (miles built), and collisions	• No facility specific reporting • Report bike/ped counts biannually	• As above	• Current: Annual bike/ped count program • Proposed: Use countywide modal studies to identify monitoring network, metrics, and data sources

APC: Automated Passenger Counter
AVL: Automatic Vehicle Locater (i.e., GPS)

Table D.6—Other CMA Approaches to Applying HCM 2010 MMLOS in Land Use Analysis Program Related to Transportation Impact Analysis

	San Francisco Planning Department*	VTA	CCTA	Alameda CTC
Overall	• TIA guideline document • No plans to adopt MMLOS	• TIA guideline document • Pilot analysis of MMLOS bike/ped methodologies • Continuing to study to determine role in TIAs	• TIA guideline document • MMLOS encouraged but not required	• Current: No TIA guideline document; flexible NOP response • Proposed: TIA guidelines with expanded list of multimodal impacts; encourage MMLOS for evaluating mitigation measures
Transit Impact Requirements	• Custom methodology for studying transit impacts that looks at capacity • Consideration of access to transit and delays to transit from site-related activities also required	• TIA guidelines include list of specific effects on transit that should be considered • List includes capacity, congestion that affects transit services, and access/egress	• No language in TIA Guide-lines about how to study transit, impacts	• Proposed: Require study of effects on transit operations, capacity, and access/ egress; no required methodology and qualitative analysis sufficient
Bicycle/Pedestrian Impact Requirements	• TIA guidelines state that impacts on pedestrians and bicycles should be analyzed qualitatively or quantitatively depending on project size and circumstances • HCM 2000 used if quantitative analysis required • Planning Department determines required analysis on case-by-case basis	• TIA guidelines name specific effects on bicycles and pedestrians that should be considered • List includes effects of vehicle trips on existing bike and pedestrian conditions, consistency with adopted plans, and if project or mitigations would impede current connections	• No language in TIA Guidelines about how to study bike or pedestrian impacts	• TIA guidelines include list of specific effects on transit that should be considered • List includes capac+A3:E6+A3:E6ity, congestion that affects transit services, and access/egress

D.3—Overview of MMLOS and Sensitivity Testing

Overview of MMLOS

The HCM 2010 introduced a series of new methodologies for assigning LOS scores for transit, bicycles, and pedestrians. Consistent with LOS for autos, these methodologies focus on the quality of experience for a user of a facility. However, unlike auto LOS for which a single variable (speed or density) determines LOS, transit, bicycle, and pedestrian LOS scores are composites based on a series of variables. For instance, transit LOS takes into account the frequency of vehicle arrivals, the on-time percentage, the travel time, the presence of covered shelters, and crowding, among other factors.

A key aspect of the research to develop MMLOS is the calibration of the various inputs – the determination of how much one factor should influence the overall modal LOS score, relative to other factors. The calibration was based on user surveys. For pedestrian and bicycle modes, participants in video labs in four cities watched footage of street segments and rated conditions on a 1-6 scale. For transit, national traveler response data to changes in transit service quality were used.

The MMLOS models can be applied at different scales, as illustrated in Figure D.1. Pedestrian and cyclist LOS can be assessed at the link, signalized intersection, segment, or facility scale; transit LOS can be assessed at the segment or facility scale. The Alameda CTC applications of HCM methodologies involve application at a segment scale, the MMLOS scores for segments are based on scores for the link and intersection that comprise that segment.

Table D.7 summarizes all of the different factors that the MMLOS model takes into account in its computation of a modal LOS score at a given scale. The plus or minus signs indicate whether this factor positively or negatively influences the LOS. It is difficult to generalize about the magnitude of influence of different factors on an LOS score. As the table indicates, larger scale applications (e.g., segment or facility) tend to make use of the LOS score from component units (e.g., the segment LOS combines the link and intersection LOS, plus a few additional factors).

Figure D.1—Scales of Application of MMLOS

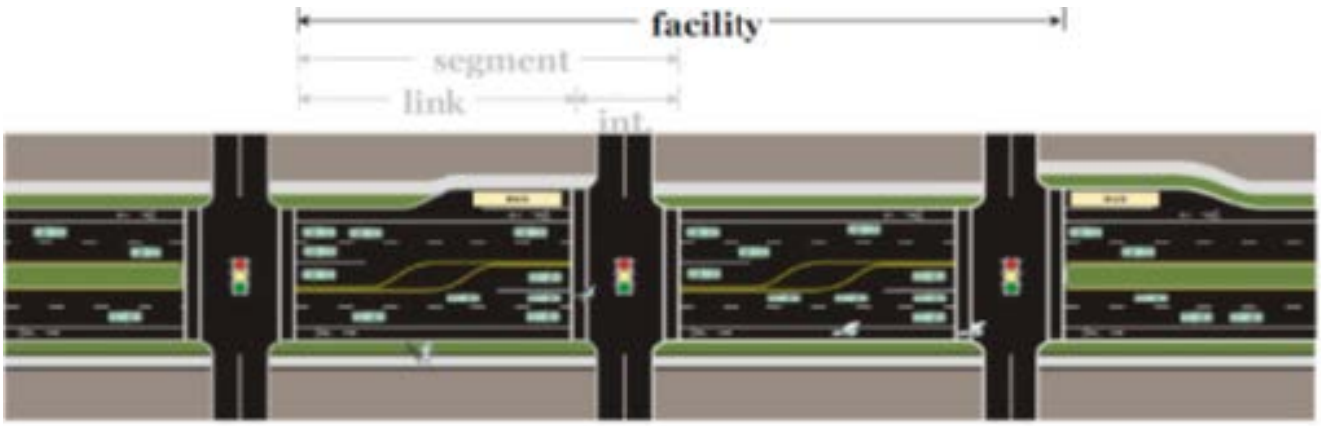


Table D.7—Variables Used in MMLOS

Mode	Link	Signalized Intersection	Segment	Facility
Pedestrian	Outside travel lane width (+) Bicycle lane/ shoulder width (+) Buffer presence (e.g., on-street parking, street trees) (+) Sidewalk presence and width (+) Volume and speed of motor vehicle traffic in outside travel lane (–)	Permitted left turn and right-turn-on-red volumes (–) Cross-street motor vehicle volumes and speeds (–) Crossing length (–) Average pedestrian delay (–) Right-turn channelizing island presence (+)	Pedestrian link LOS (+) Pedestrian intersection LOS (+) Street-crossing difficulty (–/+) Delay diverting to signalized crossing	Length weighted average of component segment LOS
Bicycle	Volume and speed of traffic in outside travel lane (–) Heavy vehicle percent (–) PCI (+) Bicycle lane presence (+) Bicycle lane, shoulder, and outside lane widths (+) On-street parking use (–)	Width of outside through lane and bicycle lane (+) Cross-street width (–) Motor vehicle traffic volume in the outside lane (–)	Bicycle link LOS (+) Bicycle intersection LOS, if signalized (+) Number of access points on right side (–)	Length weighted average of component segment LOS
Transit (mixed flow vehicles)	N/A	N/A	Access to transit (uses pedestrian link LOS) Wait for transit (frequency) Actual bus travel speed (+) Stop amenities (+) Excess wait time due to late bus/train arrival (–) Crowding (–)	Length weighted average of component segment LOS

Source: Kittelson Associates, Inc. (2012) HCM 2010: Urban Street Concepts: Pedestrian, Bicycle, and Transit. Presentation to MTC Arterial Operations Committee. March 21, 2012.

Sensitivity Testing

Alameda CTC staff performed sensitivity testing of the MMLOS methodologies by implementing the MMLOS equations in a spreadsheet model, and then observing how the MMLOS score changed when key variables were allowed to change within reasonable ranges.[1] Sensitivity testing is performed for the following applications:

Table D.8—Variables Considered for MMLOS Sensitivity Testing

Methodology	Variables Tested
Transit (Segment)	On-time percentage
	Bus speed (including delays)
	Frequency of Bus Arrivals
Bicycle (Link)	Automobile volumes
	Automobile speeds
	On-street parking occupancy
	Outside lane effective width
Pedestrian (Link)	Automobile volumes
	Automobile speeds
	Effective walkway width

General findings of sensitivity testing for (mixed flow) transit include the following:

- Transit LOS is highly sensitive to the frequency of bus arrivals (headway), though this sensitivity diminishes when headways reach 10 min or less.
- Transit LOS is not highly sensitive to on-time percentage. On-time percentage can decline by 20-30 percent without dropping an LOS grade. A substantial body of research[2] shows that poor reliability is a common reason why transit riders stop riding transit, so this attribute may be undervalued in the MMLOS transit score.
- Transit LOS is not highly sensitive to commercial speed[3] (i.e., speed that a transit vehicle actually achieves, when factoring in delays from boarding, signals, etc.). The commercial speed can drop by 5 mph or more without dropping an LOS grade. Many AC Transit routes operate at commercial speeds between 10 mph and 15 mph, so a 5 mph change in commercial speed is quite significant.

General findings of sensitivity testing for bicycles and pedestrian include the following:

- Bicycle and pedestrian LOS are both most sensitive to roadway space allocation. For bicycles, adding effective width to the outer lane—either through a wider lane or a bike lane—improves LOS by at least a letter grade. For pedestrians, adding on-street parking or items that provide a physical barrier from autos (e.g., trees, street furniture) greatly increase LOS.
- Bicycle and pedestrian LOS are not very sensitive to auto flow rates or speeds. For instance, flow rates can increase by several hundred veh/hr without seeing a change in bicycle or pedestrian LOS. Similarly, speeds can increase by 10 mph or more without registering a change in bicycle or pedestrian LOS. The lack of emphasis on traffic volumes and speeds in bicycle and pedestrian LOS seems contrary to some research on why people choose to use active transportation modes (e.g., a 2010 Alameda CTC survey found that safety concerns were the second most common reason why residents chose not to bicycle).[4]
- Bicycle LOS is highly sensitive to pavement quality.

[1] This spreadsheet model uses the equations from the HCM 2010 MMLOS methodologies and computes the MMLOS "score" (which is used to determine letter grade) for a given set of inputs.

[2] Carrell, A., A. Halvorsen, J. Walker (2012). Passengers Perceptions of and Behavioral Adaptation to Unreliability in Public Transportation. Submitted for presentation at the 92nd Transportation Research Board Annual Meeting.

[3] When elasticity of demand to travel time set at its default value for urban areas.

[4] Alameda CTC (2012). Bike to Work Day and Get Rolling Advertisement: Assessment Report. Prepared by EMC Research, February 2012.

Illustration of Sensitivity Testing

Figure D.2 and Table D.9, which follows, provide an illustration of the sensitivity testing Alameda CTC staff performed of MMLOS. Similar graphs were produced for the variables in Table D.4, and are available on request.

Figure D.2 illustrates how bicycle LOS score changes in response to variations in the automobile flow rate, when all other inputs are set to the typical values indicated in Table D.9. The figure shows that at auto flow rates less than 100 vehicles per hour per lane (vphpl), bicycle LOS is A, from 100 vphpl to roughly 400 vphpl, bicycle LOS is at B, and above 400 vphpl bicycle LOS is at C. While most users would expect cyclist conditions to degrade if a facility handles hundreds of additional vehicle trips per hour (e.g., goes from 600 vphpl to 1100 vphpl), this analysis indicates that bicycle LOS can remain at C, even with significant added vehicle traffic

Figure D.2—Illustration of MMLOS Sensitivity Testing

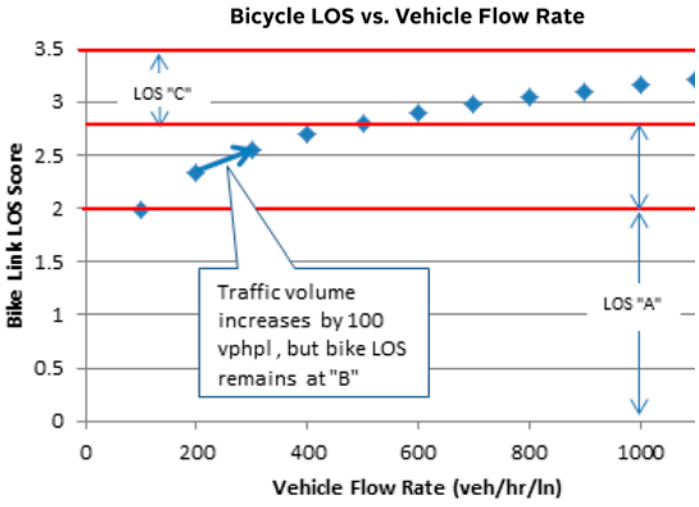
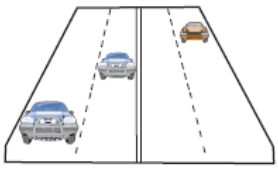
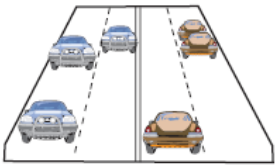
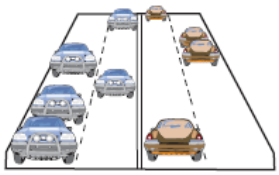
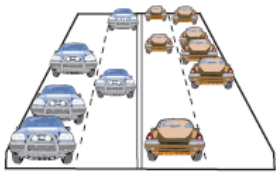
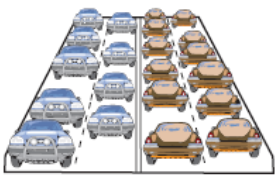


Table D.9—Values Used in Illustration of MMLOS Sensitivity Testing

Input Variable	Value	Units
Segment length	500	ft
Bike running speed	13	mi/hr
Bike control delay	10	sec
Number through lanes (direction of travel)	2	#
Pavement condition rating	3	1-6 scale
On-street parking occupancy	50	%
Width outside through lane	10	ft
Width outside shoulder (can be parked in)	8	ft
Width bike lane	6	ft
Percent Heavy Vehicles	3	%
Automobile Flow Rate (direction of travel)	Allowed to vary	veh/hr/ln
Motorized vehicle running speed	25	mi/hr
Curb present?	Y	

Levels of Service

Level of Service		Flow Conditions	Delay	Service Rating
A		Highest quality of service. Free traffic flow with low volumes. Little or no restriction on maneuverability or speed.	None	Good
B		Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability.	None	Good
C		Stable traffic flow, but less freedom to select speed or to change lanes.	Minimal	Adequate
D		Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less maneuverability and driver comfort.	Minimal	Adequate
E		Unstable traffic flow and rapidly fluctuating speeds and flow rates. Low maneuverability and low driver comfort.	Significant	Poor
F		Forced traffic flow. Speed and flow may drop to zero.	Considerable	Poor

Source: Highway Congestion Manual, 1985, Transportation Resource Board

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Appendix F1—Menu of Travel Demand Management Measures, Alameda County TDM Program: City and Public Agency Measures

TDM Program	Description	Primary Agency Responsible	City Implementation Mechanism	Recommended Application/ Context	% Trip Reduction	Factors	Source
Trip Reduction Requirements							
Set trip reduction requirements for multifamily residential or commercial development	Require as a condition of approval for developments (either commercial, multifamily residential, or both) that certain TDM measures are implemented on an ongoing basis, or that specified vehicle trip reduction requirements are met.	Cities	Planning code or other municipal ordinance	Any urban area with good transit service; suburban downtowns, commercial and mixed use areas; transit stations. (particularly in high-growth areas)	5%-15%; Enables other strategies	Effects of this strategy depend on the location/accessibility of the development site(s), demographics of the project's residential/commercial occupants/ tenants and the type of measures required. The US EPA notes that "reasonable initial targets for the programs established under a trip reduction ordinance (TRO), might be a 5-10 percent reduction in single occupant vehicle (SOV) trips, with somewhat larger reductions (perhaps 15 percent) if substantial fees for parking are imposed."	https://www.epa.gov/state-and-local-transportation
Establish a Transportation Management Association	Establish an organization to assist businesses in reducing vehicle trips, either by administering programs, providing services (such as shuttle service), or providing technical assistance to businesses. Often implemented together with a trip reduction requirement.	Cities or business associations	Planning code or other municipal ordinance; or voluntary action by business association	Commercial area or other major business or employment districts	6%-7%	The TDM Resource Center (1997) estimated that just by improving coordination, and providing information on travel alternatives, establishment of a TMA can reduce commute-related vehicle trips by 6%-7%, with greater impact when implemented in concert with other trip reduction, TDM and parking management programs and services.	TDM Resource Center (1997), Transportation Demand Management; A Guide to Including TDM Strategies in Major Investment Studies and in Planning for Other Transportation Projects, Office of Urban Mobility, WSDOT (www.wsdot.wa.gov), as cited in the Victoria Transportation Policy Institute's TDM Encyclopedia (http://www.vtpi.org/tdm/tdm44.htm), last updated in 2017.
Implement an employee-trip reduction program for municipal employees	Appoint an employee commute coordinator, and implement incentive programs to reduce single-occupant vehicle commuting among municipal employees. Elements may include: subsidized transit passes; employee parking and/ or parking cash-out programs; commuter checks; direct financial incentives to bike, walk, carpool or take transit; ride sharing; shuttles; vanpools	Cities	Modify agency procedures	Any	4-20%	Management support and the presence of an onsite employee transportation coordinator are important factors in the success of a program. Mandatory employee/commute trip reduction (CTR) ordinances often require employers with more than 50 or 100 employees at a given employment site to implement a CTR program. This reduces the costs of administering TDM programs and compliance with survey and reporting requirements, but prevents such programs from reaching the majority of employees in a given city/region who work for small to mid-sized firms and organizations with less than 50 employees.	Marlon G. Boarnet, Hsin-Ping Hsu and Susan Handy (2010), Draft Policy Brief on the Impacts of Employer-Based Trip Reduction Based on a Review of the Empirical Literature, for Research on Impacts of Transportation and Land Use-Related Policies, California Air Resources Board http://arb.ca.gov/cc/sb375/policies/policies.htm); Philip Winters and Daniel Rudge (1995), Commute Alternatives Educational Outreach, National Urban Transit Institute, Center for Urban Transportation Research, University of South Florida; Tom Rye (2002), "Travel Plans: Do They Work?," Transport Policy, Vol. 9, No. 4 (www.elsevier.com/locate/tranpol), Oct. 2002, pp. 287-298.
Safety Net							
Guaranteed/ Emergency Ride Home program	Provide a guaranteed ride home for people who do not drive to work alone to ensure they are not stranded if they need to go home in the middle of the day due to an emergency, or stay late for work unexpectedly.	GRH in Alameda County is provided by Alameda CTC		Any	9%-38%	Coupled with active program marketing by employers, including marketing of other TDM programs and financial incentives, such as parking pricing, the Alameda County Guaranteed Ride Home program has been shown to reduce drive alone vehicle trips to participating employment sites by as much as 38% (Alameda County Guaranteed Ride Home Program Evaluation, Nelson\Nygaard 2015 annual evaluation).	Alameda County Guaranteed Ride Home Program Evaluation (Nelson\Nygaard 2015, http://grh.alamedactc.org/wp-content/uploads/2016/06/ALAMEDA-CTC-GRH-Evaluation-2015-FINAL.pdf).

Appendix F1—Menu of Travel Demand Management Measures, Alameda County TDM Program: City and Public Agency Measures, Continued

TDM Program	Description	Primary Agency Responsible	City Implementation Mechanism	Recommended Application/ Context	% Trip Reduction	Factors	Source
Parking Management							
Demand-responsive pricing of on-street spaces	Set on-street parking prices based on parking demand in area to achieve parking availability targets.	Cities	Municipal code; capital project	Urban or suburban downtowns, commercial and mixed use areas; transit stations	4%-18%	One of the most significant factors affecting motorists' choice of whether to drive or travel by another mode is the price of parking at the destination. Moreover, up to 28% of traffic in mixed-use districts is attributable to cruising for parking. By encouraging use of alternative modes and reducing parking search related delays for transit, demand responsive pricing can significantly reduce vehicle trips to major destinations/districts. The impact of parking pricing depends on the overall supply and availability of both on-street and off-street parking and the extent to which employers subsidize such parking.	Low-end estimate per Harvey and Deakin (1997), who estimated that parking pricing for work and non-work trips would reduce regional vehicle trips by 2.8% (Greig Harvey and Elizabeth Deakin (1997), "The STEP Analysis Package: Description and Application Examples," Appendix B, in Apogee Research, Guidance on the Use of Market Mechanisms to Reduce Transportation Emissions, US EPA (Washington DC; www.epa.gov/omswww/market.htm)). High end estimated based on the Victoria Transportation Policy Institute (2016), Trip Reduction Tables (http://www.vtpi.org/tdm/tdm41.htm). Additional resource: http://www.spur.org/publications/spur-report/2009-05-01/critical-cooling.
Use of new meter technologies to allow multiple forms of payment and dynamic pricing	Install parking meters that allow payment by credit card or phone, and that connect to a central system in real-time, allowing for remote programming and management of parking prices.	Cities	Capital project	Urban or suburban downtowns, commercial and mixed use areas; transit stations	Enables demand responsive parking pricing	Installation of new parking management technologies, including new meters and infrastructure to support payment by cell phone and real-time monitoring of parking space utilization and turnover enable implementation of demand responsive parking pricing, which in turn reduces vehicle travel (see Demand Responsive Parking Pricing).	San Francisco Planning and Urban Research (2009). "Critical Cooling," The Urbanist, Issue 482, May, 2009 (http://www.spur.org/publications/spur-report/2009-05-01/critical-cooling).
Use of parking revenue to support other mobility/ neighborhood programs	Dedicate meter revenue from designated area to uses such as mobility improvements, neighborhood or business improvement programs, potentially through the creation of a parking benefit district.	Cities	Form dedicated Transportation Management District to receive funds	Any area with paid parking	Enables investment in Multimodal Infrastructure and TDM Programs	Creation of parking benefit district can directly support vehicle trip reduction by providing funding for investments in other multimodal access programs and services that increase opportunities for access by non-auto modes. The establishment of such districts and provisions requiring meter and permit revenues to be spent within the district can also indirectly support vehicle trip reduction by increasing local political support for demand responsive, market-based pricing of on-street and off-street parking.	
Require "Unbundling" of parking costs from rents and leases	Separate the charge for leasing or buying a unit or square footage in multifamily residential or commercial buildings from charges for parking spaces.	Cities	Modify planning code	Any	6%-16%	"Charging separately for parking is among the most effective strategies to encourage households to own fewer cars, and subsequently reduce vehicle trips. Parking costs are generally subsumed into the sale or rental price of housing and commercial real estate. For residential development, unbundled parking may prompt some residents to dispense with one of their cars and to make more of their trips by other modes. The elasticity of vehicle ownership with respect to price is typically -0.4 to -1.0. Assuming total annual vehicle spending of $7,788 (BLS Consumer Expenditure Survey, 2011), unbundling of an average of $100/month in parking costs would increase perceived transportation costs/vehicle by 15%/year for the typical hh, which in turn is expected to result in a decline in vehicle ownership of 6% (at a price elasticity of -0.4) to 16% (at -0.10), with corresponding declines in vehicle trips."	Victoria Transport Policy Institute (2017), Transportation Elasticities, http://www.vtpi.org/tdm/tdm11.htm; Bureau of Labor Statistics (2012), Consumer Expenditure Survey, 2011, www.bls.gov.

Appendix F1—Menu of Travel Demand Management Measures, Alameda County TDM Program: City and Public Agency Measures, Continued

TDM Program	Description	Primary Agency Responsible	City Implementation Mechanism	Recommended Application/ Context	% Trip Reduction	Factors	Source
Parking Management, Continued							
Reduced or eliminated minimum parking requirements	In areas that are well-served by transit and other alternatives to driving, allow developers to build residential and commercial buildings with fewer parking spaces or no parking.	Cities	Modify planning code	Any area with quality transit service	9%-16%	Eliminating or reducing off-street parking requirements allows a market based supply of parking, and eliminates the sometimes required over-supply of parking, which encourages property owners/managers to bundle parking in lease/sale agreements and provides an effective subsidy for vehicle travel. This policy reform does not directly influence vehicle travel demand associated with existing development, although elimination of minimum off-street parking requirements does remove a barrier to changes of use, and/or the lease or sale of underutilized private off-street parking constructed in accordance with previous requirements, supporting the development of market-based parking pricing that in turn reduces vehicle travel.	Range of vehicle trip reduction impact of eliminating minium parking requirements on Los Angeles' Westside, as incorporated in the vehicle trip reduction impact analysis conducted for the Los Angeles Westside Mobility Plan (http://www.westsidemobilityplan.com/transportation-demand-model/)
District-based parking management	Manage parking supply in a defined area as a unified whole in order to better manage parking demand between different facilities to eliminate cruising for parking and improve the customer experience.	Cities	Modify city agency procedures;	Urban or suburban downtowns, commercial and mixed use areas; transit stations	Enables compact development	District-based parking management offers the same benefit as shared parking facilities at a wider scale. As with shared parking facilities, the coordinated provision and management of a shared, publicly accessible supply of on-street and off-street parking at a district-scale can reduce vehicle trips by facilitating dense/compact, clustered, and mixed-use development and by reducing expenditure of land and financial resources on off-street parking, thereby reducing an effective subsidy for auto access and mobility.	
Incentivize shared parking	Facilitate the sharing of parking among multiple land uses that have complementary schedules (e.g., an office with greater demand during the day and restaurant with greater demand at night).	Enabled by cities, brokered by private businesses or developments	Modify planning code	Urban or suburban downtowns, commercial and mixed use areas	Enables compact development	Shared parking facilities can reduce vehicle trips by reducing the need for construction of dedicated off-street parking facilities for each land use/activity commensurate with the peak parking demand for that use. By so doing, shared parking facilities can enable dense, clustered development that facilitates a greater share of trips by walking, cycling and public transit. Shared parking can also reduce the total amount of land and financial resources dedicated to parking facilities, in turn reducing the effective subsidy for access by automobile that such expenditures represent. However, if shared parking increases available parking supply and thereby reduces parking prices it may in some cases increase vehicle trips and vehicle miles traveled (VMT).	Shared parking does not directly reduce vehicle travel if it substitutes for increased parking supply. To the degree that it increases the available supply of parking and reduces parking prices it can encourage automobile travel. To the degree that shared parking allows more clustered development can encourage use of alternative modes.
Improved parking wayfinding signage	Install wayfinding signage to make parking easier to find. This can help to shift parking demand away from overfull spaces to underutilized areas and can help reduce local traffic impacts caused by searching for parking.	Cities	Capital project	Urban or suburban downtowns, commercial and mixed use areas; transit stations	Not available	Enhanced wayfinding, signage, and provision of real-time information about parking supply and availability can reduce VMT and traffic congestion by reducing parking search time, but impacts on total vehicle trips are unclear.	
Urban Form and Land Use							
Compact, mixed use development and "park once" districts	Encourage development of districts that allow people to park just once if they drive to reach the district, and walk to destinations within the area once they are there.	Cities are responsible for zoning, land use planning, and development permissions	Amending general plans and zoning codes to plan for and facilitate compact, mixed-use development in appropriate areas. Support implementation of compact, mixed-use development by establishment of public development commissions and other mechanisms to support public investment.	Urban; suburban downtown; transit station	20%-40%	Recent literature indicates that compact development can reduce VMT per capita by 20%-40% compared to conventional "sprawl type" development characterized by low density and segregation of land uses and activities (vehicle trips are assumed to be reduced by a corresponding 20%-40%). Cumulative effects depend on the pace of new development in the County relative to the base of existing development (at a more rapid pace and extensive geographic scale, compact/mixed-use development/redevelopment can lead to greater reduction in vehicle trips.	Ewing, R. K. Bartholomew, S. Winkelman, J. Walters, and D. Chen (2008). Growing Cooler: The Evidence on Urban Development and Climate Change. Washington, DC: Urban Land Institute (ULI), p. 33.

Appendix F2—Menu of Travel Demand Management Measures, Alameda County TDM Program: Public or Private Organization Measures

TDM Program	Description	Primary Agency Responsible	City Implementation Mechanism	Recommended Application/ Context	% Trip Reduction	Factors	Source
Trip Reduction							
Establish a Transportation Management Association	Establish an organization to assist businesses in reducing vehicle trips, either by administering programs, providing services (such as shuttle service), or providing technical assistance to businesses. Often implemented together with a trip reduction requirement.	Businesses	Voluntary action by business association	Commercial area or other major business or employment districts	6%-7%	The TDM Resource Center (1997) estimated that just by improving coordination, and providing information on travel alternatives, establishment of a TMA can reduce commute-related vehicle trips by 6%-7%, with greater impact when implemented in concert with other trip reduction, TDM and parking management programs and services.	TDM Resource Center (1997), Transportation Demand Management; A Guide to Including TDM Strategies in Major Investment Studies and in Planning for Other Transportation Projects, Office of Urban Mobility, WSDOT (www.wsdot.wa.gov), as cited in the Victoria Transportation Policy Institute's TDM Encyclopedia (http://www.vtpi.org/tdm/tdm44.htm), last updated in 2017.
Implement an employee-trip reduction program	Appoint an employee commute coordinator, and implement incentive programs to reduce single-occupant vehicle commuting among municipal employees. Elements may include: subsidized transit passes; employee parking and/or parking cash-out programs; commuter checks; direct financial incentives to bike, walk, carpool or take transit; ride sharing; shuttles; vanpools.	Businesses		Any	4-20%	Management support and the presence of an onsite employee transportation coordinator are important factors in the success of a program. Mandatory employee/commute trip reduction (CTR) ordinances often require employers with more than 50 or 100 employees at a given employment site to implement a CTR program. This reduces the costs of administering TDM programs and compliance with survey and reporting requirements, but prevents such programs from reaching the majority of employees in a given city/region who work for small to mid-sized firms and organizations with less than 50 employees.	Marlon G. Boarnet, Hsin-Ping Hsu and Susan Handy (2010), Draft Policy Brief on the Impacts of Employer-Based Trip Reduction Based on a Review of the Empirical Literature, for Research on Impacts of Transportation and Land Use-Related Policies, California Air Resources Board http://arb.ca.gov/cc/sb375/policies/policies.htm); Philip Winters and Daniel Rudge (1995), Commute Alternatives Educational Outreach, National Urban Transit Institute, Center for Urban Transportation Research, University of South Florida; Tom Rye (2002), "Travel Plans: Do They Work?," Transport Policy, Vol. 9, No. 4 (www.elsevier.com/locate/tranpol), Oct. 2002, pp. 287-298.
Safety Net							
Guaranteed/ Emergency Ride Home program	Provide a guaranteed ride home for people who do not drive to work alone to ensure they are not stranded if they need to go home in the middle of the day due to an emergency, or stay late for work unexpectedly.	GRH in Alameda County is provided by Alameda CTC		Any	9%-38%	Coupled with active program marketing by employers, including marketing of other TDM programs and financial incentives, such as parking pricing, the Alameda County Guaranteed Ride Home program has been shown to reduce drive alone vehicle trips to participating employment sites by as much as 38% (Alameda County Guaranteed Ride Home Program Evaluation, Nelson\Nygaard 2015).	Alameda County Guaranteed Ride Home Program Evaluation (Nelson\Nygaard 2015, http://grh.alamedactc.org/wp-content/uploads/2016/06/ALAMEDA-CTC-GRH-Evaluation-2015-FINAL.pdf).
Parking Management							
Incentivize shared parking	Facilitate the sharing of parking among multiple land uses that have complementary schedules (e.g., an office with greater demand during the day and restaurant with greater demand at night).	Enabled by cities, brokered by private businesses or developments	Modify planning code	Urban or suburban downtowns, commercial and mixed use areas	Enables compact development	Shared parking facilities can reduce vehicle trips by reducing the need for construction of dedicated off-street parking facilities for each land use/activity commensurate with the peak parking demand for that use. By so doing, shared parking facilities can enable dense, clustered development that facilitates a greater share of trips by walking, cycling and public transit. Shared parking can also reduce the total amount of land and financial resources dedicated to parking facilities, in turn reducing the effective subsidy for access by automobile that such expenditures represent. However, if shared parking increases available parking supply and thereby reduces parking prices it may in some cases increase vehicle trips and vehicle miles traveled.	Shared parking does not directly reduce vehicle travel if it substitutes for increased parking supply. To the degree that it increases the available supply of parking and reduces parking prices it can encourage automobile travel. To the degree that shared parking allows more clustered development it can encourage use of alternative modes.

Appendix F2—Menu of Travel Demand Management Measures, Alameda County TDM Program: Public or Private Organization Measures

TDM Program	Description	Primary Agency Responsible	City Implementation Mechanism	Recommended Application/ Context	% Trip Reduction	Factors	Source
Multimodal Infrastructure							
Bicycle sharing services	Bicycles are available to members for short-term rental and can be returned at any bike share station. Bike share may be offered in city neighborhoods, near transit hubs, or at major employment centers.	Cities or private bicycle sharing companies (usually at invitation of a city)		Urban; suburban downtown; transit station	Impacts depend on conditions	A survey of bikeshare users in four major cities (Minneapolis, Montreal, Toronto, and Washington DC) by Shaheen and Martin (2015) found that 25-52% reported reducing their automobile travel and 1.9-3.6% reported reducing their vehicle ownership. The impact depends on the larger bike network and bicycling conditions. This research does not state if the shift from automobile trips to bicycle trips is for commute or non-commute trips, nor does the research state at what time of day these trips occur, i.e., peak or non-peak trips.	Victoria Transport Policy Institute (2017), Public Bike Systems: Automated Bike Rentals for Short Utilitarian Trips, www.vtpi.org/tdm/tdm126.htm.
Enhanced transit service	Improve transit service to better serve potential riders and shift travel from driving trips.	Transit agencies, funded by cities, counties, TMAs, BIDs, regional agencies		Any	Impacts depend on the level and quality of improvements	The elasticity of transit use with respect to transit service frequency is about 0.4, which means that a 1.0% increase in service (measured by transit vehicle mileage or operating hours) increases average ridership by 0.4%. Not all persons will be shifting from auto to transit, so the relationship is not one to one.	Brian E. McCollom, Richard H. Pratt (2004), Transit Pricing and Fares – Traveler Response to Transportation System Changes, TCRB Report 95, Transportation Research Board (www.trb.org); available at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c12.pdf.
High Occupancy Vehicle/Toll (HOV/HOT) lanes	Implement a system of express lanes for high-occupancy vehicles, transit, and/or people who pay a toll. This provides a time savings to people who commute by modes other than driving alone.	Highway districts, often led by counties or regional agencies		Freeways, any context	2% to 30%	Comsis (1993) and Turnbull, Levinson and Pratt (2006) find that HOV facilities can reduce vehicle trips on a particular roadway by 4-30%. Ewing (1993) estimates that HOV facilities can reduce peak-period vehicle trips on individual facilities by 2-10%, and up to 30% on very congested highways if HOV lanes are separated from general-purpose lanes by a barrier. Turnbull, Levinson and Pratt (2006) suggest that HOV highway lanes are most effective at reducing automobile use on congested highways to large employment centers in large urban areas with 25 or more buses per hour during peak periods, where transit provides time savings of at least 5 to 10 minutes per trip.	Comsis Corporation (1993), Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience, USDOT and Institute of Transportation Engineers (www.ite.org); available at www.bts.gov/ntl/DOCS/474.html. Katherine F. Turnbull, Herbert S. Levinson and Richard H. Pratt (2006), HOV Facilities – Traveler Response to Transportation System Changes, TCRB Report 95, Transportation Research Board (www.trb.org); available at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c2.pdf.
Financial Incentives							
Transit "fare free" zones	Transit agency provides free rides in designated zone.	Transit agencies, can be initiated/funded by cities, transportation management associations (TMAs), business districts	Can be implemented directly by transit agency, or another organization can form a funding partnership with the transit agency	Urban or suburban downtowns	Not available	Impact of transit fare-free zones is highly context specific. Some cities have seen very large increases in transit ridership within free-fare zones.	Henry Grabar (2012), "What Really Happens When a City Makes Its Transit System Free?" available at http://www.citylab.com/work/2012/10/what-really-happens-when-city-makes-its-transit-system-free/3708/.

Appendix F3.1—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Multimodal Accessibility and Transportation/Land Use Integration

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Mode Share – Work Trips	• Percent of low-income households (<$25,000 per year) within 20-minute drive or 30-minute transit ride of activity center • Percent of low-income households (<$25,000 per year) within 0.5 miles of elementary school	• Evaluate scenarios • Track trends	American Community Survey		Multimodal	Performance Report
Mode Share – School Trips	• Daily hours spent walking or biking	• Evaluate scenarios • Track trends	• Household Travel Survey • Safe Routes to School surveys		Multimodal	Performance Report; Safe Routes to School Annual Report
Travel Time – Work Trips	• Average travel time to commute to work in minutes • Percent of workers with commute exceeding specified threshold (e.g., 1 hour)	• Track trends	American Community Survey		Affordable; Efficient	Performance Report
Land Use Approvals in PDAs	• New housing units within PDAs • New retail, office, and government square footage within PDAs	• Track trends	Land use database populated by local jurisdictions		Integrated Healthy Environment (Land Use)	Performance Report (if data is available); Priority Development Area Investment and Growth Strategy (PDA IGS)
Land Use Approvals Within Half Mile of Transit	• New housing units within half-mile of high-frequency transit • New retail, office, and government square footage within half-mile of high-frequency transit	• Track trends	Land use database populated by local jurisdictions		Integrated Healthy Environment (Land Use)	Performance Report (if data is available); PDA IGS

Appendix F3.2— Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Roadway

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Travel Times	• Average travel time per trip in minutes for representative origin-destination pairs	• Evaluate scenarios • Track trends • Diagnose deficiencies • Prioritize investments • Perform before/after analysis	• Travel model	Most closely aligns to user experience and desired outcome	Connected	LOS Monitoring Report, if data is collected
Vehicle Throughput	• Average daily traffic • Peak-hour vehicle flows	• Evaluate scenarios • Track trends • Perform before/after analysis	• Caltrans Performance Monitoring System (PeMS) • Bay Area Toll Authority • Project-level data collection		Connected	Before/after study—Express Lanes
Person throughput	• Product of average daily traffic or peak-hour vehicle flows and average vehicle occupancy	• Evaluate scenarios • Track trends	• PeMS • Bay Area Toll Authority and vehicle occupancy counts or assumptions (could come from household travel surveys)		Efficient; Cost-effective	Before/after study—Express Lanes
Travel Speeds/ Level of Service	• Speeds of segments • Number of segments with speeds below threshold • LOS of segments • Congested speed based on average p.m. peak period	• Evaluate scenarios • Diagnose deficiencies • Track trends • Perform before/after analysis	Commercial speed data	Measures congestion intensity at particular locations (mobility) but does not directly measure ability to get to destinations (accessibility)	Efficient; Connected	LOS Monitoring Report; Before/after study—Express Lanes; Multimodal Arterial Plan
HOV or HOT Lane Travel Time Competitiveness	• Ratio of speed in HOV/HOT lane to general purpose lane	• Track trends • Diagnose deficiencies	• Floating car surveys • Bay Area Toll Authority • Commercial speed data in future • Alameda CTC express lane sensors		Efficient	Before/after study—Express Lanes; Express Lanes Monthly Operations Report
Person Hours of Delay	• Excess travel time due to facility operating below specified threshold	• Evaluate scenarios • Track trends	Commercial speed data and vehicle occupancy counts or assumptions	• Threshold for delay should be grounded in operational and economic considerations • Consideration should be given as to whether to normalize by motorists or traveling public	Efficient	Performance Report

Appendix F3.2—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Roadway (continued)

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Bottlenecks and Queues	• Percent of lane-miles operating below given speed	• Track trends • Diagnose deficiencies • Perform before/after analysis	• Commercial speed data • Alameda CTC express lane sensors		Efficient	Before/after study—Express Lanes
Pavement Condition Index (PCI)	• Average PCI • Percent of lane-miles that are poor, failed, and at-risk • Unmet maintenance needs over 28 years assuming current paving conditions • Unmet maintenance needs over 28 years to get local roads to certain PCI	• Evaluate blueprint scenarios • Track trends			Well-maintained	Performance Report; Multimodal Arterial Plan
Collisions and Rate	• Collisions • Collisions per million annual VMT	• Track trends • Diagnose deficiencies • Prioritize investments • Perform before/after analysis	Caltrans/California Highway Patrol Statewide Integrated Traffic Record System (SWITRS) database and PeMS		Safe	Performance Report; Multimodal Arterial Plan
Travel Reliability Index	• P.M. peak hour volume-to-capacity ratio	• Diagnose deficiencies • Perform before/after analysis	• Traffic count data from local jurisdictions and other agencies • Roadway capacity information from local jurisdictions	• Measures congestion intensity at particular locations (mobility) but does not directly measure ability to reach destinations • Measures reliability of travel through segments	Reliable	Multimodal Arterial Plan
ITS Infrastructure	• Level of ITS infrastructure	• Evaluate infrastructure ITS level	Data from local jurisdictions	• Measured using categorical classification of four-point index for level of ITS technology in a corridor	Connected; Efficient	Multimodal Arterial Plan

Appendix F3.3—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Transit

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Corridor Level Transit Speed	• Average travel time per trip in minutes for representative origin-destination pairs • Route-level average travel speed	• Evaluate scenarios • Track trends • Diagnose deficiencies • Prioritize investments • Perform before/after analysis	Transit agencies	• Most closely aligns to user experience • Should be assessed for representative travel markets	Connected (mobility, economic)	LOS Monitoring Report starting in 2018
Systemwide Travel Speed	• Average speed including delays from boarding/ alighting, signals, and traffic congestion • Average p.m. peak-hour transit travel speed	• Evaluate scenarios • Track trends • Diagnose deficiencies • Prioritize investments • Perform before/after analysis	Transit agencies		Connected (mobility, economic)	Performance Report; Countywide Transit Plan
Transit system Reliability	• Ratio of average p.m. peak-hour transit travel speed to non-peak-hour transit speed • Reduction in transit travel time (peak/off-peak)	• Evaluate scenarios • Track trends • Prioritize investments • Perform before/after analysis	Transit agencies		Connected (mobility, economic)	Countywide Transit Plan; Multimodal Arterial Plan
Ridership	• Annual boardings • Average weekday or weekend boardings • Per capita transit use • Per capita daily transit ridership • Passenger miles traveled • Percentage of intra-county passenger trips on transit	• Evaluate scenarios • Track trends • Prioritize investments • Perform before/after analysis	• National Transit Database • APC data • Alameda CTC model		Multimodal	Performance Report; Countywide Transit Plan
Service Utilization	• Boardings per revenue vehicle hour (RVH) or revenue vehicle mile (RVM)	• Evaluate scenarios • Track trends • Diagnose deficiencies • Prioritize investments	• National Transit Database • APC data	Can be measured at system- or line-level	Multimodal; Efficient	Performance Report
Load Factor	• Passenger miles traveled per RVM • Passenger miles per seat-miles	• Track trends	• National Transit Database	A basic measure of vehicle occupancy	Efficient; Reliable	Performance Report; Countywide Transit Plan

Appendix F3.3—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Transit (continued)

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
On-Time Performance	• Percent of time arriving at stops within specified window of scheduled time	• Track trends • Diagnose deficiencies • Prioritize investments • Perform before/after analysis	Transit agencies	Can be assessed at system- or line-level	Reliable	Performance Report
Cost Effectiveness	• Operating cost per RVH or RVM • Operating cost per rider • Farebox recovery ratio	• Evaluate scenarios • Track trends	National Transit Database		Cost-effective	Performance Report
Service Interruptions	• Mean time between service delays (rail) • Average miles between revenue vehicle failures (bus)	• Track trends	National Transit Database		Well-maintained;Reliable	Performance Report
Transit Fleet Age	• Average age of fleet • Percent of useful life expended of vehicles • Cost of mid-life overhaul and/or replacement before plan horizon year	• Track trends • Prioritize investments	• National Transit Database		Well-maintained	Performance Report; Countywide Transit Plan
Public Transit Accessibility	• Percent households by income level within 0.25-mile of a bus route or 0.5-mile of a rail transit stop • Number of households/jobs within 0.5 miles of transit station • Number of Communities of Concern affected by proposed projects	• Evaluate scenarios • Perform before/after analysis	GIS analysis		Multimodal; Accessible; Equitable; Connected	Countywide Transportation Plan; Countywide Transit Plan

Appendix F3.4—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Bicycling

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Counts at Multiple Locations	• Total bicyclists counted in Alameda CTC count program (63 locations, designated time periods)	• Track trends	Alameda CTC Countywide Bicycle/Pedestrian Count Program	Annual count program collects one-day counts, so disaggregation below planning area level is not advisable	Multimodal	Performance Report
Collisions Involving Bicyclists	• Total collisions involving bicyclists • Injury and fatal collisions involving bicyclists	• Track trends • Diagnose deficiencies	SWITRS	Data typically 2 years out of date	Safe	Performance Report
Bicyclist Collision Severity	• Percent of fatal or severe injury collisions involving bicyclists	• Track trends • Diagnose deficiencies	SWITRS	Data typically 2 years out of date	Safe	Countywide Transit Plan; Multimodal Arterial Plan
Local Master Plan Adoption	• Number of jurisdictions with local master plan adopted within last 5 years	• Track trends	Local jurisdictions		Integrated; Connected	Countywide Transit Plan; Multimodal Arterial Plan
Miles of Network Built	• Miles of countywide facilities implemented • Percent of network mileage implemented •Miles of "innovative"facilities constructed (e.g., using design features recently adopted to Highway Design Manual)	• Track trends	• Alameda CTC GIS database • Local jurisdictions		Connected	Performance Report
Community Members Participating in Programs	• Community members participating in bicycle safety education • Community members counted at Bike to Work Day energizer stations • Number of schools with Safe Routes to Schools programs by type	• Track trends	• Countywide program progress reports • Safe Routes to Schools Annual Report		Connected; Accessible	Performance Report
Cyclist Comfort and Safety	• Level of traffic stress analysis	• Diagnose deficiencies • Prioritize investment	Field observation	Methodology that classifies facilities into one of four levels of Traffic Stress (LTS) indicating the comfort of cyclists' experience using the facility	Multimodal; Accessible; Safe	Multimodal Arterial Plan

Appendix F3.5—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Pedestrian/Walking

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Counts at Multiple Locations	• Total pedestrians counted in Alameda CTC count program (63 locations, designated time periods)	• Track trends	Alameda CTC Countywide Bicycle/Pedestrian Count Program	Annual count program collects one-day counts, so disaggregation below planning area level is not advisable	Multimodal	Performance Report
Collisions Involving Pedestrians	• Total collisions involving pedestrians • Injury and fatal collisions involving pedestrians	• Track trends • Diagnose deficiencies	Caltrans/California Highway Patrol SWITRS database	Data typically 2 years out of date	Safe	Performance Report
Pedestrian Collision Severity	• Percent of fatal or severe injury collisions involving pedestrians	• Track trends • Diagnose deficiencies	Caltrans/California Highway Patrol SWITRS database	Data typically 2 years out of date	Safe	Performance Report
Local Master Plan Adoption	• Number of jurisdictions with local master plan adopted within last 5 years	• Track trends	Local jurisdictions		Integrated; Connected	Performance Report
Number of Pedestrian Projects Complete	• Number of projects completed by type	• Track trends	Local jurisdictions		Connected	Performance Report
Pedestrian Comfort and Safety	• Pedestrian comfort index	• Diagnose deficiencies	Field observation	Index accounting for factors including sidewalk width, presence of buffer between sidewalk and roadway, land use context, roadway classification, average daily traffic, number of lanes, and speed limit	Multimodal; Safe	Multimodal Arterial Plan

Appendix F3.6—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Goods Movement

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
GHG Emissions	• Tons of greenhouse gas (GHG) emissions from freight operations	• Prioritize investments • Evaluate scenarios	Travel model and Air Resource Board Emission Factor (EMFAC) model		Healthy Environment (air quality)	Goods Movement Plan; Rail Strategy Study
Air Quality	• Tons of PM2.5 emissions from freight operations • Tons of NOx emissions from freight operations	• Prioritize investments • Evaluate scenarios	Travel model and EMFAC model		Healthy Environment (air quality)	Goods Movement Plan; Rail Strategy Study
Equity	• Freight impacts such as light, noise pollution, safety, air pollution, and encroachment on specific, adjacent communities most affected	• Diagnose deficiencies • Prioritize investments	• GIS analysis (to identify communities) • Qualitative assessment and project-level studies (to determine impacts)		Equitable	Goods Movement Plan; Rail Strategy Study
Travel-time Delay	• Excess time due to travel below specified threshold (trucks) • Excess time due to congestion (rail, terminals)	• Diagnose deficiencies • Prioritize investments • Perform before/after analysis • Evaluate scenarios	• Commercial speed data • Caltrans PeMS • Travel model • Project-level studies (e.g., Project Study Reports, Environmental Impact Reports (EIRs))		Efficient (mobility)	Goods Movement Plan
Buffer Time Index	• Ratio of 95th percentile travel time to free-flow travel time for freight (truck) routes (freeway and some conventional highways)	• Prioritize investments	• Commercial speed data • Caltrans PeMS		Reliable (mobility)	Goods Movement Plan
Truck-involved Crashes	• Crashes involving trucks	• Diagnose deficiencies • Track trends	Caltrans/California Highway Patrol SWITRS database		Safe	Goods Movement Plan
Rail Collisions	• Crashes at at-grade rail crossing	• Diagnose deficiencies	Federal Rail Authority Office of Safety Analysis		Safe	Goods Movement Plan; Rail Strategy Study
Freight Infrastructure Conditions	• PCI on truck routes • Bridge condition rating	• Diagnose deficiencies • Evaluate scenarios	MTC StreetSaver		Well-maintained	Goods Movement Plan

Appendix F3.6—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Goods Movement (continued)

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Resiliency	• Addresses freight system vulnerability to major service disruptions due to major natural or other events	• Diagnose deficiencies	Qualitative assessment and project-level studies		Well-maintained	Goods Movement Plan
Use of Innovative Technology	• Use of ITS and other innovative technologies such as zero emissions	• Prioritize investments	Qualitative assessment		Efficient; Cost-effective	Goods Movement Plan
Multimodal Connectivity and Redundancy	• Freight route access from/to locations with significant freight activities	• Diagnose deficiencies • Prioritize investments	• GIS analysis and qualitative assessment		Connected (land use)	Goods Movement Plan; Rail Strategy Study
Compatibility with Land-use Decisions	• Locations and corridors with significant freight activities in proximity to non-compatible land uses currently and in the future	• Diagnose deficiencies • Prioritize investments	• GIS analysis and qualitative assessment		Integrated (land use)	Goods Movement Plan
Jobs and Economic Impact	• Jobs generated by project • Economic output generated by project • Jobs in goods movement- dependent industries	• Prioritize investments • Track trends • Perform before/after analysis • Evaluate scenarios	IMPLAN model		Cost-effective (economic)	Goods Movement Plan
Truck Route Accommodation Index	• Truck Route Accommodation Index	• Diagnose deficiencies • Prioritize investments	• Field observation • Data from jurisdictions	Index based on a three-point scoring system to measure curb-lane width and on-street parking in urban environments	Connected	Multimodal Arterial Plan

Appendix F3.7—Comprehensive Inventory of Performance Measures for Existing and Potential Applications: Environment, Equity, and Health

Measure/Concept	Metric	Applications	Data Sources	Considerations	CTP Goals (CMP Goals)	Report/Document (as applicable)
Activity Center Accessibility	• Percent of low-income households (<$25,000 per year) within 20-minute drive or 30-minute transit ride of activity center • Percent of low-income households (<$25,000 per year) within 0.5 miles of elementary school	• Evaluate scenarios	American Community Survey and GIS analysis	Best for less-frequent reporting as measure not highly dynamic	Equitable; Integrated; Connected (land use)	Countywide Transportation Plan
Physical Activity	• Daily hours spent walking or biking	• Evaluate scenarios • Track trends	• Travel model and off-model tools • California Health Interview Survey		Multimodal; Healthy environment	Countywide Transportation Plan
GHG Emissions	• Tons of daily GHG emissions (CO_2 equivalent) from passenger and freight transportation	• Evaluate scenarios	Travel model and Air Resource Board EMFAC model	Data limitations preclude annual monitoring	Healthy environment (air quality)	Countywide Transportation Plan
PM 2.6 Emissions	• Tons of daily particulate matter emissions from passenger and freight transportation	• Evaluate scenarios	Travel model and Air Resource Board EMFAC model	Data limitations preclude annual monitoring	Healthy environment (air quality)	Countywide Transportation Plan

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Travel Demand Management Checklist

The Travel Demand Management (TDM) Element included in the Alameda County Congestion Management Program requires each jurisdiction to comply with the Required Program. This requirement can be satisfied in three ways. The legislation declares the following:

- Option 1: Adopting "Design Strategies for encouraging alternatives to using auto through local development review" prepared by ABAG and the Bay Area Air Quality Management District;
- Option 2: Adopting new design guidelines that meet the individual needs of the local jurisdictions and the intent of the goals of the TDM Element; or
- Option 3: Providing evidence that existing local policies and programs meet the intent of the goals of the TDM Element.

For jurisdictions that have chosen to satisfy this requirement by Option 2 or 3 above, the following checklist has been prepared. To ensure consistency and equity throughout Alameda County, this checklist identifies the components of a design strategy that should be included in a local program to meet the minimum CMP conformity requirements. The required components highlighted in bold type are shown at the beginning of each section. A jurisdiction must answer "Yes" to each of the required components to be considered consistent with the CMP. Each jurisdiction will be asked to annually certify that it is complying with the TDM Element. Local jurisdictions will not be asked to submit the back-up information to the CMA justifying its response; however, it should be available at the request of the public or neighboring jurisdictions.

Questions regarding optional program components are also included. Local jurisdictions are encouraged but not required to answer these questions. This checklist will help the CMA to further support local jurisdictions and TDM activities throughout the county.

(Note: **Bold type face** indicates those components that must be included in the "Required Program" to be found in compliance with the Congestion Management Program.)

Bicycle Facilities

Goal

To develop and implement design strategies that foster the development of a countywide bicycle program that incorporates a wide range of bicycle facilities to reduce vehicle trips and promote bicycle use for commuting, shopping and school activities, and recreation. (Note: examples of facilities are bike paths, lanes, or racks.)

Local Responsibilities

1. **Does your jurisdiction have design strategies or adopted policies that include the following?**
   - **A. A system of bicycle facilities that connects residential and/or non-residential development to other major activity centers?**
     Yes _____ No _____
   - B. Bicycle facilities that provide access to transit?
     Yes ____ No ____
   - C. Construction of bicycle facilities needed to fill gaps, (i.e., gap closure), not provided through the development review process?
     Yes ____ No ____
   - D. Consideration of bicycle safety such as safe crossing of busy arterials or along bike trails?
     Yes ____ No ____
   - E. Bicycle storage and bicycle parking for (A) multi-family residential and/or (B) non-residential developments?
     Yes ____ No ____

2. How does your jurisdiction implement these strategies? Please identity.
   - Zoning Ordinance _____
   - Design Review _____

- Standard Conditions of Approval _____
- Capital Improvement Program _____
- Specific Plan _____
- Other _____

Pedestrian Facilities

Goal

To develop and implement design strategies that reduce vehicle trips and foster access for commuting, shopping, recreation, and school activities.

Local Responsibilities

3. Does your jurisdiction have design strategies or adopted policies that incorporate and provide for the following?

A. Reasonably direct, convenient, accessible, and safe pedestrian connections to major activity centers, transit stops, or hubs parks/open space and other pedestrian facilities?
Yes ____ No ____

B. Construction of pedestrian paths needed to fill gaps, (i.e., gap closure), not provided through the development process?
Yes ____ No ____

C. Safety elements such as convenient crossing at arterials?
Yes ____ No ____

D. Amenities such as lighting, street trees, and trash receptacles that promote walking?
Yes ____ No ____

E. Encouraging uses on the first floor that are pedestrian oriented, entrances that are conveniently accessible from the sidewalk or transit stops, or other strategies that promote pedestrian activities in commercial areas?
Yes ____ No ____

4. How does your jurisdiction implement these strategies? Please identity.

- Zoning Ordinance _____
- Design Review _____
- Standard Conditions of Approval _____
- Capital Improvement Program _____
- Specific Plan _____
- Other _____

Transit

Goal

To develop and implement design strategies in cooperation with the appropriate transit agencies that reduce vehicle trips and foster the use of transit for commuting, shopping, recreation, and school activities.

Local Responsibilities

5. Does your jurisdiction have design strategies or adopted policies that incorporate the following?

A. Provide for the location of transit stops that minimize access time, facilitate intermodal transfers, and promote reasonably direct, accessible, convenient and safe connections to residential uses and major activity centers?
Yes ____ No ____

B. Provide for transit stops that have shelters or benches, trash receptacles, street trees or other street furniture that promote transit use?
Yes ____ No ____

C. Include a process for including transit operators in development review?
Yes ____ No ____

D. Provide for directional signage for transit stations and/or stops?
Yes ____ No ____

E. Include specifications for pavement width, bus pads or pavement structure, length of bus stops, and turning radii that accommodates bus transit?
Yes ____ No ____

6. How does your jurisdiction implement these strategies? Please identity.

- Zoning Ordinance _____
- Design Review _____
- Standard Conditions of Approval _____
- Capital Improvement Program _____

- Specific Plan _____
- Other _____

Carpools and Vanpools

Goal

To develop and implement design strategies that reduce the overall number of vehicle trips and foster carpool and vanpool use.

Local Responsibilities

7. Does your jurisdiction have design strategies or adopted policies that incorporate the following?
   A. For publicly owned parking garages or lots, are there preferential parking spaces and/or charges for carpools or vanpools?
      Yes ____ No ____
   B. Convenient or preferential parking for carpools and vanpools in non-residential developments?
      Yes ____ No ____
   C. Information and marketing to support carpool and vanpool matching series and for use on city website, social media, and printed materials?
      Yes ____ No ____
   D. Policies that support reducing free parking or providing incentives to businesses to decrease free parking?
      Yes ____ No ____

8. How does your jurisdiction implement these strategies? Please identity.
   - Zoning Ordinance _____
   - Design Review _____
   - Standard Conditions of Approval _____
   - Capital Improvement Program _____
   - Specific Plan _____
   - Other _____

Park and Ride

Goal

To develop design strategies that reduce the overall number of vehicle trips and provide park and ride lots at strategic locations.

Local Responsibilities

9. Does your jurisdiction have design strategies or adopted policies that incorporate the following?
   A. Promotion of park-and-ride lots located near freeways or major transit hubs using city outreach methods?
      Yes ____ No ____
   B. Process that provides input to Caltrans to insure HOV by-pass at metered freeway ramps?
      Yes ____ No ____

10. How does your jurisdiction implement these strategies? Please identity.
    - Zoning Ordinance _____
    - Design Review _____
    - Standard Conditions of Approval _____
    - Capital Improvement Program _____
    - Specific Plan _____
    - Other _____

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Federal and State Transportation Control Measure

The transportation control measures (TCMs) that the BAAQMD and MTC have set forth for the Bay Area are included in plans designed to achieve air quality standards, defined in state and federal legislation.

The following lists include all TCMs contained in the three plans, intended to improve air quality in the Bay Area.

Table H.1—Federal TCMs in the 2001 San Francisco Bay Area Ozone Attainment Plan (State Implementation Plan)

TCM	Description
Original TCMs from 1982 Bay Area Air Quality Plan	
TCM 1	Reaffirm Commitment to 28 Percent Transit Ridership Increase Between 1978 and 1983
TCM 2	Support Post-1983 Improvements in the Operators' Five-Year Plans and, After Consultation with the Operators, Adopt Ridership Increase Target for the Period 1983 through 1987
TCM 3	Seek to Expand and Improve Public Transit Beyond Committed Levels
TCM 4	High Occupancy Vehicle (HOV) Lanes and Ramp Metering
TCM 5	Support ERIDES Efforts
TCM 6*	Continue Efforts to Obtain Funding to Support Long Range Transit Improvements
TCM 7	Preferential Parking
TCM 8	Shared Use Park and Ride Lots
TCM 9	Expand Commute Alternatives Program
TCM 10	Information Program for Local Governments
TCM 11**	Gasoline Conservation Awareness Program (GasCAP)
TCM 12**	Santa Clara County Commuter Transportation Program
Contingency Plan TCMs Adopted by MTC in February 1990 (MTC Resolution 2131)	
TCM 13	Increase Bridge Tolls to $1.00 on All Bridges
TCM 14	Bay Bridge Surcharge of $1.00
TCM 15	Increase State Gas Tax by 9 Cents
TCM 16*	Implement MTC Resolution 1876, Revised — New Rail Starts

TCM	Description
Contingency Plan TCMs Adopted by MTC in February 1990 (MTC Resolution 2131), Continued	
TCM 17	Continue Post-Earthquake Transit Services
TCM 18	Sacramento-Bay Area Amtrak Service
TCM 19	Upgrade Caltrain Service
TCM 20	Regional HOV System Plan
TCM 21	Regional Transit Coordination
TCM 22	Expand Regional Transit Connection Ticket Distribution
TCM 23	Employer Audits
TCM 24	Expand Signal Timing Program to New Cities
TCM 25	Maintain Existing Signal Timing Programs
TCM 26	Incident Management on Bay Area Freeways
TCM 27	Update MTC Guidance on Development of Local TSM Programs
TCM 28	Local Transportation Systems Management (TSM) Initiatives
New TCMs in 2001 Ozone Attainment Plan	
TCM A	Regional Express Bus Program
TCM B	Bicycle/Pedestrian Program
TCM C	Transportation for Livable Communities
TCM D	Expansion of Freeway Service Patrol
TCM E	Transit Access to Airports

*Deleted by EPA action from ozone plan.
** Deleted by EPA action from ozone plan, but retained in Carbon Monoxide Maintenance Plan.

Source: Final Transportation-Air Quality Conformity Analysis for the Amended Plan Bay Area and the 2017 Transportation Improvement Program, Metropolitan Transportation Commission, 2016.

]

Status of Transportation Control Measures

The original set of TCMs plus the five most recent TCMs (A-E) have been fully implemented.

Table H.2—Implementation of State TCMs in the 2017 Clean Air Plan

TCM	Description
TCM-A1	Local and Area-wide Bus Service Improvements
TCM-A2	Improve Local and Regional Rail Service
TCM-B1	Freeway and Arterial Operations Strategies
TCM-B2	Transit Efficiency and Use
TCM-B3	Bay Area Express Lane Network
TCM-B4	Goods Movement Improvements and Emission Reduction Strategies
TCM-C1	Voluntary Employer-Based Trip Reduction Program
TCM-C2	Safe Routes to Schools and Safe Routes to Transit Programs
TCM-C3	Ridesharing Services and Incentives
TCM-C4	Conduct Public Outreach & Education
TCM-C5	Smart Driving
TCM-D1	Bicycle Access and Facilities Improvements
TCM-D2	Pedestrian Access and Facilities Improvements
TCM-D3	Local Land Use Strategies
TCM-E1	Value Pricing Strategies
TCM-E2	Parking Policies to Reduce VMT
TCM-E3	Transportation Pricing Reform

Source: BAAQMD, 2017 Clean Air Plan.

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Subarea Travel Demand Model Guidelines

General Policy Statement

Alameda CTC maintains a Countywide Travel Demand Model (Countywide Model) which is in conformance with MTC's Regional Travel Demand Model and land use database and can therefore be used to satisfy Congestion Management Program (CMP) requirements in Alameda County. The Master Transportation Demand Model Agreements made between the Alameda County Congestion Management Agency and local jurisdictions detail the process through which local jurisdictions can have access to the Countywide Model and use its results for CMP conformance purposes.

An alternative to using the Countywide Model which local jurisdictions or groups of local jurisdictions may wish to pursue is the development of subarea travel demand models (subarea models) for the purpose of satisfying CMP requirements. Subarea models may be more effective than the Countywide Model for the evaluation of certain local conditions or CMP applications.

Local jurisdictions may use a subarea model for CMP purposes so long as the subarea model demonstrates consistency with the Countywide Model. Results from subarea models which are not consistent with the Countywide Model will not be accepted by Alameda CTC for CMP purposes.

Consistency Guidelines

A two-step process has been established to determine consistency of a subarea model with the Countywide Model. The two-step process includes an initial evaluation of subarea model compatibility by the Alameda CTC (step one) and, if required, additional data and information to be submitted to Alameda CTC to verify consistency (step two).

Step One

A. Local jurisdictions apply to Alameda CTC for a consistency finding. The application shall consist of the following:
   i. A written communication to Alameda CTC requesting a model consistency finding.
   ii. A complete model consistency checklist.

B. In the case of new/proposed subarea models, Alameda CTC staff must be part of the Local Technical Advisory/Oversight Committee/Taskforce for model development.

Step Two

C. If additional information is required to determine consistency, Alameda CTC staff will review modeling procedures and land use database issues with local modeling staff.

Acceptable CMP-related Uses of a Consistent Subarea Model

A subarea model that has been found to be consistent with the countywide Model may be used for the following CMP-related uses:

1. Forecasting of operating conditions on roadway segments.
2. Development impact analysis performed for the CMP Land Use Analysis Program.
3. Testing of mitigation measures or deficiency plan recommendations to address degradation of level of service (LOS) on CMP roadway segments operating below LOS E.

Annual Recertification

Annual recertification of subarea models is required by Alameda CTC. Recertification requires a written request that must clearly explain why the subarea model should be recertified on the basis of one of the following two conditions:

1. All changes to the model specifications of the land use database (1) were reported to the Alameda CTC previously or (2) are changes done in coordination with the land use database update process of the Countywide Model; or
2. Recertification request includes a completed consistency checklist.

Development and Operation of Subarea Models

It is assumed that subarea models will be developed by local jurisdictions that will have responsibility for their operation, maintenance, and the costs associated with them. As a condition for delegation of Alameda CTC modeling responsibilities, it is assumed that local jurisdictions will commit to providing adequate ongoing technical support for all model applications in support of a CMP requirement (e.g., land use analysis or deficiency analysis). It is assumed that consultant assistance would normally be required for model development and maintenance.

Dispute Resolution

Disputes regarding consistency or appropriate use of a subarea model shall be brought to the Alameda County Technical Advisory Committee.

Alameda CTC Checklist for Modeling Consistency for Local Jurisdictions

This checklist guides local jurisdictions wishing to develop a subarea model through their model development and consistency review process by providing an inventory of specific products to be developed and submitted to Alameda CTC, and by describing standard practices and assumptions.

A. General approach:

Discuss the general approach to travel demand modeling by the local jurisdiction and the subarea model's relationship to the Alameda Countywide Travel Demand Model.

PRODUCT:

1) Description of the subarea model's general approach.

B. Demographic/economic/land use forecasts:

Both base and forecast year demographic/economic/land use ("land use") inputs must be consistent—though not identical—to the census tract-level data provided to Alameda CTC by ABAG. Specifically, if local jurisdictions wish to reallocate land use within their own jurisdiction, they must consult with Alameda CTC. Further, the resulting deviation in the subject jurisdiction (or jurisdictions) should be no greater than plus or minus 1 percent from the jurisdiction-level totals in the Alameda CTC land use database for the following variables: population, households, jobs, and employed residents.

Outside the subject jurisdiction (or jurisdictions) and within Alameda County, the land use variables in the travel analysis zones used by the jurisdiction's model must match the Alameda CTC model or another adopted subarea model (e.g., the City of Hayward could adopt the land use from within the City of Dublin

if the City of Dublin's model for use in the TAZs within the City of Dublin had an approved subarea model).

Outside of Alameda County, the land use variables in the travel analysis zones used by the jurisdiction's model must match the Alameda CTC model exactly.

PRODUCTS:

2) A statement establishing that the differences between key Alameda CTC land use variables and those of the subarea model do not differ by more than 1 percent at the jurisdiction level for the subject jurisdiction. A statement establishing that no differences exist at the census-tract-level outside the jurisdiction between the Alameda CTC forecast or the forecast contained within an adopted subarea model.
3) A table comparing Alameda CTC land use estimates with the subarea model land use estimates by jurisdiction for population, households, jobs, and employed residents for both the base year and the horizon year.
4) If land use estimates within the jurisdiction are modified from the Alameda CTC model projections, agendas, discussion summaries, and action items from each meeting held with Alameda CTC at which the redistribution was discussed, as well as before/after census-tract-level data summaries and maps.

C. Pricing assumptions:

Use Alameda CTC's automobile operating costs, transit fares, and bridge tolls or provide an explanation for the reason such values are not used.

PRODUCT:

5) Table comparing the assumed automobile operating cost, key transit fares, and bridge tolls to Alameda CTC's values for the horizon year.

D. Network assumptions:

Use Alameda CTC's regional highway and transit network assumptions for the other Bay Area counties and other jurisdictions within Alameda County. Local jurisdictions should include a more detailed network definition relevant to their own jurisdiction in addition to the regional highway and transit networks. For the CMP horizon year, to be compared with the Transportation Improvement Program (TIP) interim year, regionally significant network changes in the base case scenario shall be limited to the current TIP for projects subject to inclusion in the TIP.

PRODUCT:

6) Statement establishing satisfaction of the above.

E. Automobile ownership:

Use Alameda Countywide Travel Demand Model automobile ownership models or forecasts or submit alternative models to Alameda CTC for review and comment.

PRODUCT:

7) Planning area-level table comparing estimates of households by automobile ownership level (zero, one, two, or more automobiles) to Alameda CTC's estimates for the horizon year.

F. Trip generation:

Use Alameda Countywide Travel Demand Model trip generation models or submit alternative models to Alameda CTC for review and comment.

PRODUCT:

8) County-level tables comparing estimates of trip and/or tour frequency by purpose to MTC's estimates for the horizon year.

G. Trip distribution:

Use Alameda Countywide Travel Demand Model trip distribution models or submit alternative models to Alameda CTC for review and comment.

PRODUCTS:

9) County-level tables comparing estimates of average trip distance by tour/trip purpose to Alameda CTC's estimates for the horizon year.

10) Planning area-to-planning area comparison of journey-to-work or home-based-work flow estimates to MTC's estimates for the horizon year.

H. Travel mode choice:

Use Alameda Countywide Travel Demand Model mode choice models or submit alternative models to Alameda CTC for review and comment.

PRODUCT:

11) County-level tables comparing travel mode share estimates by tour/trip purpose to Alameda CTC's estimates for the horizon year.

I. Traffic assignment:

Use Alameda Countywide Travel Demand Model traffic assignment models, or submit alternative models to Alameda CTC for review and comment.

PRODUCTS:

12) County-level, time-period-specific comparison of vehicle miles traveled and vehicle hours traveled estimates by facility type to Alameda CTC's estimates for the horizon year.
13) County-level, time-period-specific comparison of estimated average speed on freeways and all other facilities, separately, to Alameda CTC's estimates for the horizon year.

CMP Transportation Impact Analysis Technical Guidelines

Project Trip Generation Methodologies

The ITE trip generation handbook should be used to determine project trip generation.

Projects near transit or in infill development areas may apply one of the following methodologies to adjust project vehicle trip generation to reflect project context. Other alternative trip generation methodologies will be considered on a case-by-case basis.

EPA's Trip Generation Tool for Mixed Use Development (MXD model):

A description of this method can be found online at: http://www.epa.gov/smartgrowth/mxd tripgeneration.html

Caltrans/UC Davis Smart Growth Trip Generation Adjustment Method

A description of this method can be found online at: http://ultrans.its.ucdavis.edu/projects/smart-growth-trip-generation

MTC's Station Area Residents (STARS) Mode Split Based Adjustment Method

This method uses household travel survey data to determine how mode share varies by land use characteristics and then use this information to reduce ITE trip generation rates. The key assumption is that ITE rates produce a reasonably accurate estimate of person-trips, but that in a more dense, transit accessible setting, many of these person-trips may use modes other than driving, so the vehicle-trip rate will be lower.

In the Bay Area, MTC conducted extensive analysis of the 2000 Bay Area Travel Survey (BATS 2000), the most recent household travel survey, as part of its Station Area Residents Study (STARS). This analysis looked at how mode shares differ as a function of proximity to transit and land use density. The findings of this study are well-suited to producing urban trip generation rate estimates. For instance, the driving mode share of residents living within a half-mile of transit is only 48.2 percent, while for residents living more than a mile from transit, in a lower density area, this share is 87.0 percent.

This information can be used to adjust ITE trip generation rates. For instance, for a development located more than a mile from transit in a high-suburban density area, an adjusted ITE rate could be computed as:

Adjusted Rate = ITE Rate X 0.82

Note that the STARS analysis examined mode share for specific trip purposes (e.g., school trips, shopping trips, social/recreation trips) and depending on the type of development project, an analyst may wish to use this information instead of the mode share for all trips to adjust ITE rates.

Types of Impacts and Impact Assessment Methodologies

Autos

Projects should consider auto impacts on MTS roadway segments including:

- **Vehicle delay:** the analysis should assess impacts to vehicle delay on MTS roadway segments.

The Highway Capacity Manual 2010 (HCM 2010) freeway and urban streets methodologies are the preferred methodologies to study vehicle delay impacts. However, project sponsors may use the

HCM 2000 if conformance with local requirements is required.

Consistency with adopted plans: the analysis should disclose whether the project is consistent with plans including future Alameda Countywide Arterial Corridors Plan, and should consider opportunities to implement the plan in the project vicinity.

Transit

Projects should consider impacts to MTS transit operators and riders, including:

- **Effects of vehicle traffic on mixed flow transit operations:** the analysis should evaluate if vehicle trips generated by the project will cause congestion that degrades transit vehicle operations. Analysis may be qualitative and may be based on auto traffic circulation analysis, but should consider that transit vehicles may have unique considerations compared to autos (e.g., pulling into and out of stops, longer gaps needed for left turns). For instance, the analysis may use information about delay on a key segment or intersection with transit service to determine that impacts to transit operations will exist. It should not be assumed that transit operational impacts will not exist if a roadway operates at better than automobile LOS F. Furthermore, the mitigations required to address transit operations impacts may not be the same as those to address vehicle delay.
- **Transit capacity:** the analysis should evaluate if transit trips generated by the project will cause ridership to exceed existing transit capacity. Both vehicle and station circulation should be considered, as appropriate. Transit operators should be consulted to see if any routes or stations in the project area require capacity analysis. If a project will cause transit capacity impacts such that additional service will be required, funding for transit operations cannot be assumed and appropriate mitigations considered. If such analysis is required, it should consider volume to capacity ratios. The Alameda CTC can assist in providing ridership data by line or route if needed.

  Transit access/egress: the analysis should assess whether pedestrian connections between the project site and transit stops are adequate to support any project trip generation assumed to be served by transit. The site plan should provide good access between buildings and from buildings to transit stops and stations. Sidewalks should be provided on both sides of all streets to provide access to bus stops. Sidewalks and curb cuts at intersections should be designed for ADA accessibility. Designs should avoid requiring pedestrians to walk through parking lots to access transit service. The assessment should include consideration of the safety of crossing opportunities, as needed. Qualitative analysis is sufficient to assess this impact type.
- **Future transit service:** developments in areas without current transit service should seek to avoid designs which preclude future transit service. Trip generation estimates should assess the potential for new transit service, and if warranted by demand, the environmental review should address a funding mechanism to support service. Transit operators should be consulted to ensure that project design and surrounding roadway networks can accommodate transit vehicles (e.g., grades, turning radii, lane widths are appropriate). Where a project proposes private shuttle services, a cost analysis of providing this service versus subsidizing existing transit service should be included. Qualitative analysis is sufficient to assess this impact type.
- **Consistency with adopted plans:** the analysis should disclose whether the project is consistent with plans including transit operators Short Range Transit Plan and Long Range Transit Plan and the future Alameda Countywide Transit Plan, and should consider opportunities to implement the plan in the project vicinity.
- **Circulation Element:** for projects involving major update to a General Plan Circulation Element,

local jurisdictions are encouraged to develop and maintain a transit component of their Circulation Element.

Bicycles

Projects should consider impacts including:

- **Effects of vehicle traffic on bicyclist conditions:** the analysis should evaluate if vehicle trips generated by the project will present barriers to bicyclists safely crossing roadways or executing turning movements as well as whether project traffic volumes necessitate greater separation between bicyclists and vehicles. This analysis may be qualitative and may be based on auto traffic circulation analysis.
- **Site development and roadway improvements:** the analysis should evaluate if the project or its mitigations will reduce or sever existing bicycle access or circulation in the area as well as whether the project could produce conflicting movements between bicyclists and vehicle turning into and out of project driveways. Qualitative analysis is sufficient to assess this impact type.
- **Consistency with adopted plans:** the analysis should disclose whether the project is consistent with the Alameda Countywide Bicycle Plan, and should consider opportunities to implement the plan in the project vicinity, either in conjunction with other roadway improvements required by the project or as a mitigation measure for air quality or traffic circulation impacts. Qualitative analysis is sufficient to assess this impact type.

Pedestrians

Projects should consider impacts including:

- **Effects of vehicle traffic on pedestrian conditions:** the analysis should evaluate if vehicle trips generated by the project will present barriers to pedestrians safely crossing roadways at intersections and mid-block crossings. This analysis may be qualitative and may be based on auto traffic circulation analysis.
- **Site development and roadway improvements:** the analysis should evaluate if the project or its mitigations will reduce or sever existing pedestrian access or circulation in the area as well as whether the project could produce conflicting movements between pedestrian and vehicle turning into and out of project driveways. The need for new crossing opportunities or circulation given project pedestrian access points and likely access/egress routes should be considered. Qualitative analysis is sufficient to assess this impact type.
- **Consistency with adopted plans:** the analysis should disclose whether the project is consistent with the most recent Alameda Countywide Pedestrian Plan, and should consider opportunities to implement the plan in the project vicinity, either in conjunction with other roadway improvements required by the project or as a mitigation measure for air quality or traffic circulation impacts. Qualitative analysis is sufficient to assess this impact type.

Other Impacts and Opportunities

Projects should consider impacts including:

- Noise impacts: for projects adjacent to state roadway facilities, the analysis should address noise impacts of the project. If the analysis finds an impact, then mitigation measures (i.e., soundwalls) should be incorporated as part of the conditions of approval of the proposed project. It should not be assumed that federal or state funding is available.
- Transit Oriented Development access: local jurisdictions are encouraged to adopt a comprehensive Transit Oriented Development (TOD) program, including environmentally clearing all access improvements necessary to support TOD as part of environmental documentation.

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Project Delivery and Timely Use of Funds Policy

Project Delivery Assistance

Alameda CTC will provide consultant services to assist in monitoring the implementation of projects programmed to receive state, federal, or TFCA funds programmed by Alameda CTC. This service will include ongoing collection of project monitoring information and development of a quarterly status report on the delivery status of projects programmed to receive state, federal, or TFCA funds by Alameda CTC. The consultant will also meet with Caltrans local assistance as needed to review the status of the Caltrans review of Alameda County projects.

Alameda CTC will provide consultant services to project sponsors to assist in the delivery of state, federal, or TFCA funded projects programmed through Alameda CTC. This assistance could include services such as project delivery workshops for sponsors and development and management of a project delivery website. Due to budget limitations in Alameda CTC's project oversight contract, one-on-one on-call assistance will likely be limited to the review of documents and answering questions relative to a specific funding program. Sponsors that require assistance beyond this level, such as completing documents that are required for project delivery, can contract with Alameda CTC's oversight consultant directly or request Alameda CTC expand the current scope of work on a task order basis to provide the necessary support. Any additional task order work completed through the Alameda CTC contract will be reimbursed to Alameda CTC from the local agency receiving the support. Billing rates for any additional support work will be based on the rates in the current Alameda CTC contract with the oversight consultant.

Agencies receiving funding through Alameda CTC will, as part of the application process, submit to Alameda CTC a baseline schedule for project delivery. Alameda CTC's project monitoring consultant will provide assistance to sponsors in the development of the baseline schedule to insure that all required state and federal approvals are accounted for in the schedule. Agencies agree to provide Alameda CTC with quarterly updates on project delivery status and to notify and seek Alameda CTC's concurrence on any significant changes to the project delivery schedule, scope, or cost. The baseline schedule will identify major milestones for each project that are critical for timely delivery of the project. These milestones will likely include start and end dates for environmental clearance, development of PS&E, acquisition of right of way, and construction of the project. Deadlines associated with any timely use of funds provisions such as Caltrans or California Transportation Commission authorizations and/or approvals will also be identified.

Alameda CTC may host a workshop on project delivery after the adoption of a state/federal/TFCA program by the Alameda CTC Commission. The workshop would review the project delivery requirements of the particular funding program(s) adopted by Alameda CTC and provide an opportunity for project sponsors to have questions related to the specific program answered by both Alameda CTC staff and staff from other agencies that may have project approval authority (i.e., Caltrans, BAAQMD, MTC). Attendance at this workshop may be mandatory for all project sponsors.

Extension and Reprogramming Requests

Alameda CTC will consider the following prior to endorsing an extension or reprogramming request: Are the circumstances causing the delay truly "extraordinary," or an oversight during project planning?

Although the circumstances may be unforeseen, baseline project schedules should incorporate risk factors related to unknowns. Are these circumstances "beyond the control" of the implementing agency? Sponsors requesting extensions or reprogramming will be

required to justify why the circumstances causing the delay are "extraordinary and beyond their control."

Has the project sponsor exercised due diligence in the delivery of the project and is such diligence documented? Have previous milestones in the project delivery scheduled been met and has Alameda CTC been notified of and concurred with any changes to the schedule? Alameda CTC should be notified when a delay situation, or potential delay situation, arises in order to be prepared to review the request and to take whatever action may be required to assure no loss of funding to Alameda County. Sponsors requesting extensions or reprogramming must demonstrate that previous milestones identified in the baseline schedule as critical to the delivery of the project have been met, or that Alameda CTC was notified and concurred with any potential delays to the project schedule.

If Alameda CTC was to grant an extension or reprogramming, how prepared is the sponsor to meet future delivery deadlines? For example, failure to meet the initial STIP project delivery deadline—project allocation approval—will result in the funds being deprogrammed from the project but returned to the county share. However, once the initial allocation has been received, failure to meet any future SB 45 deadlines will result in a loss of funds to both the project and the county. Sponsors requesting extensions or reprogramming requests must provide Alameda CTC with a revised schedule for project delivery and a strategy for resolution of the problem that is causing the delay in project delivery. This revised schedule will also provide detail relating to the impact this delay and modified schedule may have on other projects sponsored by the respective agency. Alameda CTC will consider the circumstances causing the project delivery delay and the impact on other projects being implemented by the sponsor and may deny the extension or reprogramming request until the sponsor can demonstrate an acceptable resolution to the problem causing the delay.

Timely Use of Funds Policy

Any project sponsor that fails to meet a timely use of funds deadline that results in a loss of programmed funds to Alameda County will be penalized in a future state or federal funding cycle in an amount equal to the funds that were lost to Alameda County.

This policy will apply to all funding programs administered by Alameda CTC. Projects programmed to receive TFCA funds will be subject to additional delivery requirements included in Alameda CTC's adopted TFCA Timely Use of Funds Policy.

Glossary of Terms

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

Assembly Bill 32 (AB 32). The California Global Warming Solutions Act passed in 2006, requires the California Air Resources Board (CARB) to develop regulations and other measures to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions to 1990 levels by 2020, representing a 25 percent reduction statewide.

Assembly Bill 210 (Wieckowski) (AB 210). Adopted in August 2013, AB 210 extends the authority of the County of Alameda and authorizes the County of Contra Costa to impose the transactions and use tax of no more than 0.5 percent for countywide transportation programs until December 31, 2020, conditioned upon prior voter approval.

Assembly Bill 1358 (Leno) (AB 1358). The Complete Streets Act of 2008 stipulates that during the next major update of their General Plan's Circulation Element, all jurisdictions in California are required to incorporate complete streets principles. Alameda CTC required jurisdictions to adopt complete streets policies by June 30, 2013 as part of the Master Program Funding Agreements signed in 2012. All jurisdictions have met this requirement.

Assembly Bill 1963 (Katz) (AB 1963). This legislation amended the Congestion Management Program in 1994 to define the performance element of the CMP as in Government Code Section 65089(b)(2) and to meet Federal Transportation Act requirements. Since that time, the California Department of Transportation Highway Capacity Manual 2010 and the California Environmental Quality Act transportation checklist have also emphasized the importance of multimodal transportation system performance measures. (See Chapter 4 for the Alameda County CMP multimodal performance measures.)

Assembly Bill 2032 (Dutra) (AB 2032). Adopted in 2004, this legislation authorized implementation of the Interstate 680 Express Lane. The project was complete and opened to traffic in September 2010. The legislation also approved a second express lane in the county. The CMA approved Interstate 580 (I-580) as a candidate corridor, electronic toll system installation began spring 2015, and the I-580 Express Lanes opened in February 2016.

Association of Bay Area Governments (ABAG). The regional agency that is responsible for regional planning other than for transportation. ABAG publishes forecasts of projected growth for the region.

average daily traffic (ADT). The average number of vehicles passing a specified point during a 24-hour period.

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

California Transportation Commission (CTC). A body appointed by the governor and confirmed by the legislature that considers Regional Transportation Improvement Programs and the Proposed State Transportation Improvement Program (PSTIP) (see definitions herein) and then includes transportation projects from these programs into the State Transportation Improvement Program (STIP). This

qualifies the projects for state funding. The CTC also has financial oversight over the major programs authorized by Propositions 111 and 108.

California State Department of Transportation (Caltrans). As the owner/operator of the state highway system, responsible for its safe operation and maintenance. Proposes projects for Intercity Rail, Interregional Roads, and soundwalls in the PSTIP (see definition herein). Also responsible for the State Highway Operations and Protection Program SHOPP) (see definition herein), Toll Bridge, and Aeronautics programs. The TSM and State/Local Partnership Programs are administered by Caltrans. Caltrans is the implementing agency for most state highway projects, regardless of program, and for the Intercity Rail program.

Capital Improvement Program or Comprehensive Investment Plan (CIP). According to CMP legislation, a seven-year program of projects to maintain or improve the traffic level of service and performance measures developed by the CMP, 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. Alameda CTC developed its first Comprehensive Investment Plan in 2015, which translates long-range plans into a short-range investment strategy by establishing a list of near-term priority improvements to enhance and maintain Alameda County's multimodal transportation system. Alameda CTC's CIP serves as the CMP Capital Improvement Program.

congestion management agency (CMA). The agency responsible for developing the Congestion Management Program and coordinating and monitoring its implementation.

Congestion Management Program (CMP). A multi-jurisdictional program to reduce traffic congestion. Required of every county in California with an urbanized area as defined by the Census Bureau (of at least 50,000 people).

Council of Governments (COGs). A voluntary consortium of local government representatives, from contiguous communities, meeting on a regular basis, and formed to cooperate on common planning and solve common development problems of their area. COGs can function as the regional transportation planning agencies (RTPAs) and metropolitan planning organizations (MPOs) in urbanized areas.

database. 1) A collection of data from which information is derived and from which decisions can be made; and 2) A non-redundant collection of data items that can be processed by one or more computer applications.

Federal Highway Administration (FHWA). A division of the U.S. Department of Transportation, established to ensure development of an effective national road and highway transportation system. It assists states in constructing highways and roads, and provides financial aid at the local level.

Federal Transit Administration (FTA). A division 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.

FTA Section 5307 funds. Distributes funds to regions based on an urbanized area formula. FTA identifies 12 urbanized areas in our region—five large and seven small. In large urbanized areas, formula funds generally can be used only for capital investment. In small urbanized areas, these funds can be used for capital investment and for transit operations.

FTA Section 5309, Capital Investment Grants. Discretionary grant program provided by the federal government through FTA to fund major transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. The law requires that projects seeking CIG funding complete a series of steps over several years to be eligible for funding.

FTA Section 5310 funds. Formula funding to states for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities.

FTA Section 5337 funds. Provides grants to maintain transit systems in a state of good repair. These funds may be used only for equipment replacement or rehabilitation, or other capital projects needed to keep transit systems in good repair. These funds are limited to projects for transit systems such as rail, passenger ferry, or bus rapid transit; and for buses that operate in high-occupancy vehicle lanes.

FTA Section 5339 funds. Provides grants to replace, rehabilitate, and purchase buses and related equipment, or to build bus-related facilities.

fund estimate. A biennial State Transportation Improvement Program estimate of all resources available for the state's transportation infrastructure over the next five-year period; establishes the program funding levels for the STIP and the State Highway Operation and Protection Program.

high-occupancy vehicle (HOV) lane. A lane of freeway reserved for the use of vehicles with more than a preset number of occupants; such vehicles often include buses, taxis, and carpools.

Interregional Transportation Strategic Plan (ITSP). Provides guidance for the identification and prioritization of interregional transportation improvements to be funded in the Interregional Transportation Improvement Program (ITIP). The 2015 ITSP expanded the analysis from focusing on ITIP investment in interregional highways and intercity rail to analyzing the entire interregional transportation system regardless of funding source. The STIP consists of the ITIP and the RTIP.

level of service (LOS). A qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Low Carbon Transit Operations Program (LCTOP). Established by Senate Bill 862 in 2014 to provide operating and capital assistance for transit agencies to reduce greenhouse gas emissions and improve mobility, with a priority on serving disadvantaged communities. Senate Bill 862 began appropriating 5 percent of the annual auction proceeds in the Greenhouse Gas Reduction Fund for LCTOP in 2015-16. Caltrans, the Air Resources Board, and the State's Controller's Office administer this program.

metropolitan planning organization (MPO). A federally mandated and federally funded transportation policy-making organization in the U.S. made up of representatives from local government and governmental transportation authorities. MTC is the designated MPO for the Bay Area region.

Metropolitan Transportation Commission (MTC). Created by the state legislature in 1970 to prepare a Regional Transportation Plan for the nine counties of the Bay Area. Other important responsibilities include approving transportation projects that receive state or federal funding, allocating several sources of funds for transit operations, evaluating the performance of the transportation system and the provision of transportation service, promoting and setting guidelines for transit systems coordination, and advocating adequate transportation funding. MTC consists of 21 members, 18 voting members, including one member from ABAG, and one member from the San Francisco Bay Conservation and Development Commission. MTC also includes three non-voting members, from the state and federal transportation agencies.

Metropolitan Transportation System (MTS). A regional, multimodal transportation system defined as part of MTC's RTP. Emphasizes a balanced strategy of highway, arterial, and transit capital investments and operational improvements to manage congestion projected over the next 20 years.

Model: Gravity. A mathematical trip distribution model that is based on the premise that the amount of travel

between two zones in proportional to the amount of activity in each of the two zones and inversely proportional to the impedance to travel between the two zones. In other words, trips produced in any given area will distribute themselves in accordance with the accessibility of other areas and the opportunities.

Model: Land Use. A model used to predict the future spatial allocation of urban activities (land use), given total regional growth, the future transportation system, and other factors.

Model: Mode Choice. A model used to forecast the proportion of total person trips on each of the available transportation modes.

Model: Regional Growth. A model used to estimate land uses in a region.

Model: Travel Demand. A mathematical equation or graphic technique used to simulate traffic movements, particularly those in urban areas or on a freeway.

MTC Resolution No. 3434. The Regional Transit Expansion Program adopted by MTC in 2001 as Resolution 3434 identifies the regional commitment to transit investments in the Bay Area. It has been amended many times. The most recent September 2014 amendment identified rail and bus projects that will improve mobility and enhance connectivity for residents in Alameda County and the Bay Area.

MTC Resolution No. 3866. Adopted in February 2010 and last revised in July 2015, the Transit Coordination Implementation Plan, which includes a regional Transit Connectivity Plan and Implementation Requirements, coordinates public transportation services between public transit operators, including coordination of fares and schedules for all public transit systems within MTC's jurisdiction, and details a cohesive strategy for easing passengers' movement from one transit system to another.

MTC Resolution No. 4035. Adopted in May 2012 and last revised in July 2016, sets forth project selection policies and programming for the federal Surface Transportation Program (STP)/Congestion Mitigation and Air Quality (CMAQ) funding available to MTC for its programming discretion as part of the federal Transportation Improvement Program. Resolution 4035 established the One Bay Area Grant Program, which integrates the region's federal transportation program with California's climate law (Senate Bill 375) Sustainable Communities Strategy for the Bay Area by promoting transportation investments in Priority Development Areas.

obligation. An action by an administrative agency approving the spending of money for a specific purpose to a specific grant recipient.

pavement management program (PMP). 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 PMP that is in conformance with the criteria adopted by the City/County/State Cooperation Committee. At a minimum, the PMP/pavement management system must contain:

- An inventory of the arterial and collector routes in the jurisdiction that is reviewed and updated at least biennially;
- An assessment of pavement condition for all routes in the system, updated biennially;
- Identification of all sections of pavement needing rehabilitation or replacement; and
- Determination of budget needs for rehabilitation or replacement of deficient sections of pavement for the current biennial period, and for the following biennial period.

Each implementing jurisdiction certifies and submits the PMP certification to MTC. MTC then makes a finding of agreement with the certification and transmits the certification to the CTC with the RTIP.

peak (peak period, rush hours). 1) The period during which the maximum amount of travel occurs. It may be specified as the morning (a.m.) or afternoon or evening (p.m.). 2) The period when demand for transportation service is the heaviest.

principal arterial. The functional classification system at the federal level used to define principal arterials for rural areas, urbanized areas, and small urban areas. As of December 31, 2013, the FHWA no longer reflects the rural/urban setting within the classification name in its Federal Functional Classification System, and includes it as an attribute in the description of a roadway. In urbanized areas, the principal arterial system can be identified as unusually significant to the area in which it lies in terms of the nature and composition of travel. Principal arterials derive their importance from service to rural oriented traffic, but equally or even more importantly, from service for major movements within the urbanized area. The principal arterial system should carry the major portion of trips entering and leaving the urban area, as well as the majority of through movements desiring to bypass the central city. In addition, significant intra-area travel, such as between major business districts and outlying residential areas, between major inner city communities, or between major suburban centers should be served by this system. Frequently, the principal arterial system will carry important intra-urban as well as intercity bus routes. Finally, this system in small urban and urbanized areas should provide continuity for all rural arterials which intercept the urban boundary. Because of the nature of the travel served by the principal arterial system, almost all fully and partially controlled access facilities will be part of this functional system. However, this system is not restricted to controlled access routes. The spacing of urban principal arterials will be closely related to the trip-end density characteristics of particular portions of the urban areas. The U.S. Department of Transportation provides the guidance than 50-65 percent of the VMT should be accounted for on the principal arterial system.

Project Delivery Report. Government Code Section 14525.5 requires Caltrans to submit to the legislature by November 15 of each year a report on the delivery of all state highway projects in the adopted STIP which cost $1 million or more and for which the department is the responsible agency for project development work (including some, but not all locally funded projects). The report must identify milestone dates by month and year for these projects, and must summarize the number of projects which met milestones and identify those that failed to meet one or more milestones. For those that failed, the report must explain the reasons for the delay and present a plan to resolve any problems and a new schedule for delivery. Annually, as part of the project delivery report required pursuant to Section 14525.5, Caltrans must report on the difference between the original allocation made by the CTC and the actual construction capital and support costs at project close for all state transportation improvement program projects completed during the previous fiscal year.

Project Study Report (PSR). Government Code Section 14529.4 requires that any capacity-increasing project on the state highway system, prior to programming the STIP, have a completed PSR. The PSR must include 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.

Proposed State Transportation Improvement Program (PSTIP). This seven-year program is based on the adopted STIP and the most recent Project Delivery Report. It may include additional schedule changes and/or cost changes, plus new projects that Caltrans proposed for the interregional road system, retrofit soundwalls, and toll bridge and aeronautics programs, as well as the intercity rail program. Caltrans may also propose, under specified conditions, alternative FCR projects to those proposed in the RTIPs; this is the only overlap with the RTIPs. The PSTIP is due to the CTC on 12/1 of odd numbered years.

Priority Conservation Area (PCA). Regionally significant open space for which there exists broad consensus for long-term protection but nearer-term development pressure.

Priority Development Area (PDA). An area in an existing community, near transit service, that has planned for more housing.

public transit (mass transit). Passenger transportation service, usually local in scope, that is available to any person who pays a prescribed fare. Operated on established schedules along designated routes or lines with specific stops and is designed to move relatively large numbers of people at one time. Examples include bus, ferry, light rail and rapid transit.

public transportation. Transportation service to the public on a regular basis using vehicles that transport more than one person for compensation, usually but not exclusively over a set route or routes from one fixed point to another. Routes and schedules may be determined through a cooperative arrangement. Subcategories include public transit service and paratransit service available to the general public.

Regional Transportation Improvement Program (RTIP). 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 the CMAs, then evaluated and prioritized by the regional agency for submission to the CTC. The RTIP has a seven-year planning horizon and is updated every two years. MTC may only include projects in its RTIP that are first included in a CMP.

Regional Transportation Plan (RTP). A comprehensive 20-year plan for the region, updated every four years by the regional transportation planning agency (for the Bay Area, MTC). The RTP includes goals, objectives and policies, and recommends specific transportation improvements.

ridesharing. Two or more persons traveling by any mode, including but not limited to, carpooling, vanpooling, taxipooling, shuttle and public transit.

Rural Area. As defined by the U.S. Census Bureau, all territory, population, and housing units located outside Urban Areas and Urban Clusters (see definitions).

Senate Bill 45 (Kopp) (SB 45). In 1997, this legislation had a significant impact on the regional transportation planning and programming process, by amending the STIP process. The statute delegated major planning decisions to the regional transportation planning agencies (RTPAs), requiring them to take a more active role in selecting and programming transportation projects and encouraged more decision-making through partnerships among stakeholders. It divided STIP into two sub-programs and designated 75 percent of funding to the region for the Regional Transportation Improvement Program (RTIP) and 25 percent of funding to the California Department of Transportation for the Interregional Transportation Improvement Program (ITIP). SB 45 changed the transportation funding structure; modified the transportation programming cycle, program components, and expenditure priorities; and required the development and implementation of transportation system performance measures.

Senate Bill 226 (Simitian) (SB 226). In 2011, the Office of Planning Research issued regulations to implement SB 226, which seeks to streamline environmental review for eligible infill development projects. These Infill Streamlining updates to the California Environment Quality Act Guidelines also contain the performance standards used to determine an infill project's eligibility for a streamlined review.

Senate Bill 375 (Steinberg) (SB 375). Adopted in October 2008, SB 375 requires California's MPOs to prepare a "sustainable communities strategy (SCS)" that demonstrates how the region will meet its greenhouse gas reduction target through integrated land use, housing and transportation planning.

Senate Bill 595 (Beall) (SB 595). Allows voters to approve a bridge toll increase to fund congestion-relief projects and improve mobility in the bridge corridors. Governor Brown signed this bill into law in October 2017. This bill

requires the City and County of San Francisco and the other eight counties in the San Francisco Bay Area to conduct a special election, to be known as Regional Measure 3, on a proposed increase in the amount of the toll rate charged on the state-owned toll bridges in that area to be used for specified projects and programs.

Senate Bill 743 (Steinberg) (SB 743). Adopted in September 2013, SB 743 includes a series of amendments to the California Environmental Quality Act that streamline the environmental review process, encourage infill development, overhaul traditional impact analysis metrics, and exempt certain projects in transit priority areas. For the Congestion Management Program, it removed the sunset date for establishing the infill opportunity zones including related alternative level of service standard requirements.

Senate Bill 916 (Perata) (SB 916). As amended in June 2003, this bill required the supervisors of the counties of San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Solano to call a special election in March 2004 on Regional Measure 2 (RM2) authorizing a comprehensive Regional Traffic Relief Plan (RTRP). The voters in those counties passed the measure, which authorized a $1 toll surcharge to fund specified transportation projects and programs. In addition, the bill required the Metropolitan Transportation Commission to adopt a regional transit connectivity plan.

Senate Bill 1474 (Kopp) (SB 1474). Passed in 1996, this bill requires the Metropolitan Transportation Commission (MTC) to adopt, in coordination with a regional transit coordinating council, rules and regulations to promote the coordination of fares and schedules for all public transit systems within its jurisdiction. See MTC Resolution No. 3866 regarding the Transit Coordination Implementation Plan.

Senate Bill 1636 (Figueroa) (SB 1636). Signed by the governor in 2002, this bill established "infill opportunity zones" (IOZs) to encourage transit supportive and infill developments. The statute exempted infill opportunity zones from the requirements to maintain level of service E. None of the local jurisdictions within Alameda County established or adopted infill opportunity zones by the statute's sunset period of December 2009. Senate Bill 743 instituted key changes to the CMP statute that support infill development, including lifting the sunset date on designating IOZs and directing the governor's Office of Planning and Research to develop new metrics for assessment of transportation impacts to replace the level of service measure.

Short Range Transit Plans (SRTP). A seven-year comprehensive plan required by federal and regional transportation funding agencies of all transit operators. The plans must define the operator's mission, analyze its past and current performance, and plan specific operational and capital improvements to realize its short-term objectives.

State Highway Operations and Protection Program (SHOPP). Formerly called the Highway System Operations and Protection Plan (HSOPP), the state's "fix it first" program created by state legislation that funds the repair and preservation of the State Highway System (SHS), safety improvements, and highway operational improvements. SHOPP is a four-year program of projects, adopted separately from the STIP cycle. Revenues for the SHOPP are generated by federal and state gas taxes and are fiscally constrained by the State Transportation Improvement Program fund estimate produced by Caltrans based on established criteria and adopted by the California Transportation Commission.

State Implementation Plan (SIP). State plan required by the Federal Clean Air Act of 1990 to attain and maintain national ambient air quality standards. It is adopted by local air quality districts and the State Air Resources Board.

State Transit Assistance (STA). Funds generated by the sales tax on diesel fuel that may be used by transit operators for both capital projects and transit operations. The amount of money available for transit agencies varies from year to year based on

the ups and downs of diesel prices. The state splits the STA program into two components: 1) Population-based funds: MTC receives STA based on the Bay Area's share of the population. MTC determines how to use these funds (Resolution 3837); 2) Revenue-based funds: The state allocates funds to transit operators based on their revenue as defined by PUC 99314 (b). Operators have full discretion over the use of TDA and most of STA apportioned to them. For most smaller transit agencies, Transportation Development Act and STA are their main sources of operating funds.

State Transportation Improvement Program (STIP). The biennial five-year plan adopted by the CTC for future allocations of certain state transportation funds for state highway improvements, intercity rail, and regional highway and transit improvements. The list of transportation projects are proposed in the RTIPs and PSTIP.

Sustainable Communities Strategy (SCS). Mandated by Senate Bill 375, an Integrated Transportation, Land Use and Housing Plan required to be developed by the 18 metropolitan planning organizations in California to reduce greenhouse gas emissions. The SCS is adopted as an element of the Regional Transportation Plan.

Traffic Systems Management (TSM) Program. A state-funded program that funds those projects which "increase the number of person trips on the highway system in a peak period, without significantly increasing the design capacity of the system, measured by vehicle trips, and without increasing the number of through traffic lanes." This program is funded outside of the STIP process, through direct application to Caltrans. The CTC programs the projects from a prioritized list submitted by Caltrans. Statute requires that priority be given to projects from counties with adopted CMPs.

Transit and Intercity Rail Capital Program (TIRCP). Created by Senate Bill 862 in 2014 and modified by Senate Bill 9 in 2015 to provide grants from the Greenhouse Gas Reduction Fund to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems to reduce emissions of greenhouse gases by reducing congestion and vehicle miles traveled throughout California. Caltrans and California State Transportation Agency administer this program.

Transit Capital Improvement Program (TCI). A state program for transit capital projects and the STA program (see definition). An annual program, all state funds must be matched 50 percent by local funds.

Transportation Control Measures (TCMs). 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 that can be found in MTC Resolution No. 4274 and were added over successive revisions to the State Implementation Plan. State legislation established a joint process between MTC and BAAQMD for preparing the transportation control measures plan as part of the state Clean Air Plan. BAAQMD adopted the most recent Clean Air Plan in 2017.

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

Transportation Management Association (TMA). A consortium of business and industry (private sector) interests formed to help solve mutual transportation problems. A TMA is not in any form a publicly sponsored or coordinated agency or group.

Transportation System Management (TSM). A set of relatively low-cost techniques to relieve congestion

without adding vehicle capacity to the transportation system. TSM techniques are numerous. Some are "demand-based" techniques such as ridesharing programs and flexible work schedules enabling employees to commute to and from work outside of peak hours. (Sometimes the demand-based strategies are referred to as TDM). Other TSM measures are engineering-oriented, such as timing traffic signals to smooth the flow of traffic, and ramp metering, which regulates the entrance of vehicles onto a freeway, increasing the efficiency of the freeway.

Travel Demand Management (TDM). "Demand-based" techniques for reducing traffic congestion, such as ridesharing programs and flexible work schedules enabling employees to commute to and from work outside of peak hours.

Urban Cluster (UC). As defined by the U.S. Census Bureau, densely developed territory that has at least 2,500 people but fewer than 50,000 people. The Census Bureau first introduced the UC concept for Census 2000 to provide a more consistent and accurate measure of urban population, housing, and territory throughout the United States, Puerto Rico, and the Island Areas.

Urbanized Area (UA). As defined by the U.S. Census Bureau, densely developed territory that contains 50,000 or more people. The Census Bureau delineates UAs to provide a better separation of urban and rural territory, population, and housing in the vicinity of large places.

vehicle miles traveled (VMT). A measurement of miles traveled by vehicles within a specified region for a specified time period. Travel demand forecasting (modeling) is used to generate the average trip lengths for a region. The average trip length measure can then be used in estimating vehicle miles of travel, which in turn is used in estimating gasoline usage or mobile source emissions of air pollutants.

vehicle occupancy. The number of people aboard a vehicle at a given time; also known as auto or automobile occupancy when the reference is to automobile travel only.

vehicle trip. A one-way movement of a vehicle between two points.

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Glossary of Acronyms

ABAG	Association of Bay Area Governments
AC Transit	Alameda-Contra Costa Transit District
ACCMA	Alameda County Congestion Management Agency
ACE	Altamont Corridor Express
ACTA	Alameda County Transportation Authority (former 1986 Measure B authority)
ACTAC	Alameda County Technical Advisory Committee
ACTIA	Alameda County Transportation Improvement Authority (former 2000 Measure B authority)
ADA	Americans with Disabilities Act
BAAQMD	Bay Area Air Quality Management District
BART	San Francisco Bay Area Rapid Transit District
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program, Comprehensive Investment Plan
CMAQ	Congestion Mitigation and Air Quality
CMP	Congestion Management Program
CTC	California Transportation Commission
CTP	Countywide Transportation Plan
FWHA	Federal Highway Administration
GPA	General Plan Amendment
GRH	Guaranteed Ride Home Program
HCM	Highway Capacity Manual
HOT	high occupancy toll
HOV	high occupancy vehicle
JPA	joint powers authority
LAVTA	Livermore Amador Valley Transit Authority
LOS	level of service
MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation System
NEPA	National Environmental Protection Agency
NOP	notice of preparation
O-D	origin/destination
PCI	Pavement Condition Index
PDA	Priority Development Area
RTP	Regional Transportation Plan
RTIP	Regional Transportation Improvement Program
SCS	Sustainable Communities Strategy
SFCTA	San Francisco County Transportation Authority
SIP	State Implementation Plan
STA	State Transit Assistance
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
SWITRS	Statewide Integrated Traffic Records System
TAZ	Traffic Analysis Zones
TCM	Transportation Control Measures

TCRP	Transportation Congestion Relief Program
TDM	travel demand management
TEP	Transportation Expenditure Plan
TFCA	Transportation Fund for Clean Air
TIP	Transportation Improvement Program
TLC	Transportation for Livable Communities
TMS	Transportation Management System
TOD	transit oriented development
VMT	vehicle miles traveled
VTA	Santa Clara Valley Transportation Authority

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