# How Measuring Vehicle Miles Traveled Can Promote Health Equity

## *Case Studies & Lessons Learned from Early Adopters of VMT*

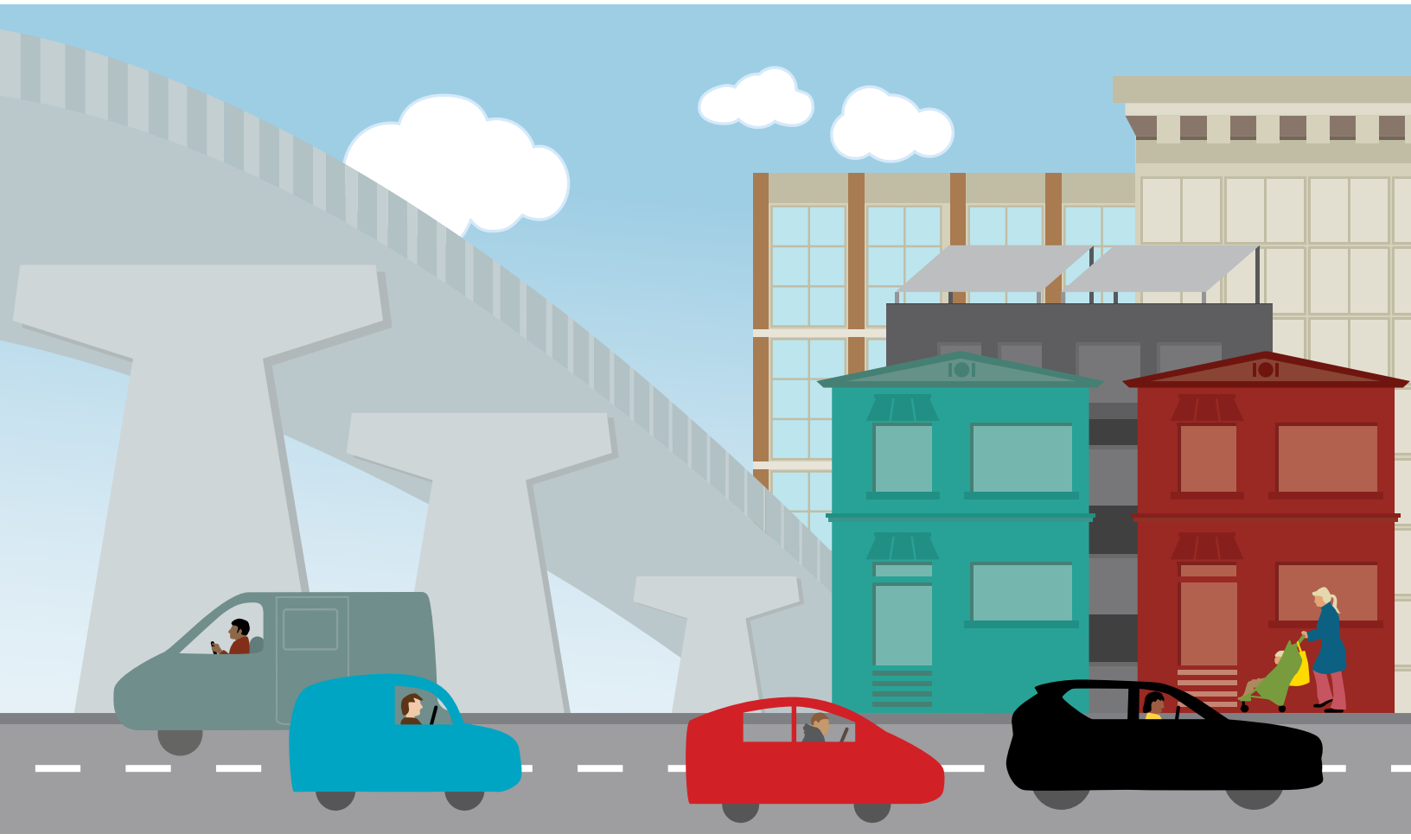

ChangeLab Solutions

# Contents

# Introduction

Picture your community, including all the people, houses, schools, shops and other businesses, parks and open space, and streets. What parts of your community contribute to good health and safe environments, and what parts do not? Now think about how your community came to be the way it is. The fact is, your community looks, feels, and acts the way it does in part because of the ways that urban planners, transportation engineers, and elected officials measure it. Data and analysis shape where development and infrastructure improvements go, how they function, and what they look like. As a result, data and analysis play an important role in determining the health, equity, and sustainability of our communities.

Until recently, the planning process was built on a foundation of data and analysis that focused on accommodating car trips within the transportation network. This emphasis has resulted in communities that face significant barriers to healthy living, environmental protection, and equity. The passage of California's Senate Bill 743 (SB 743) presents an opportunity to advance new analytical methods that support healthier, more equitable, and more sustainable communities.



# What is SB 743?

Adopted in 2013, SB 743 mandates a change in the way that transportation impacts are analyzed for proposed plans and projects in Californian communities, shifting the focus of analysis away from auto-oriented level-of-service (LOS) standards to more multimodal vehicle miles traveled (VMT) measures in support of the state's environmental goals.

SB 743 required California's Office of Planning and Research (OPR) to amend their guidelines for how cities evaluate the transportation impacts of new plans and proposed developments under the California Environmental Quality Act (CEQA). Traditionally, LOS, which focuses on comfort and convenience for drivers, has been used as the standard of measurement for transportation impacts. With the passage of SB 743, VMT is now the state's standard unit of measurement, and OPR has identified VMT per capita, VMT per employee, and net VMT as new metrics for transportation analysis.[1,2] By July 1, 2020, VMT must be used to measure the transportation impact of transportation projects (with the exception of roadway capacity projects)[3] and land use projects that require CEQA analysis. As a result, local governments may need to adjust their methods for measuring transportation impacts so that they are based on VMT.

*By July 1, 2020, VMT must be used to measure the transportation impact of transportation projects and land use projects that require CEQA analysis.*

For local governments and regional agencies across the state, this change from LOS to VMT represents a significant shift in transportation analysis. Prior to SB 743, using LOS to measure traffic impacts resulted in the prioritization of congestion-reducing strategies, such as adding driving lanes, that ultimately encourage more driving at the expense of the safety and convenience of other modes. In contrast, measuring transportation impacts using VMT will require communities to think about how to shift transportation from dependence on single-occupancy vehicles to other modes of transportation that reduce the number of miles traveled. In essence, this shift flips on its head what is deemed a significant impact under CEQA by categorizing car-centric planning as counterproductive to environmental goals. Auto delay will now no longer be considered a significant impact under CEQA. This shift also means that increased miles driven as a result of any proposed plan or project could be deemed a significant impact under CEQA. This change in measurement strategy also opens up consideration of additional mitigation strategies to reduce VMT, such as carpooling, expanded public transit services, and pedestrian- and bicycle-friendly infrastructure. In short, a focus on VMT, rather than LOS, as a measurement of impact makes it easier for communities to plan for mobility options that support people's needs related to walking, bicycling, and public transit use without vehicle traffic flow being the highest priority.

*A focus on VMT rather than LOS makes it easier for communities to plan for mobility options that support people's needs related to walking, bicycling, and public transit use.*

## DEFINITIONS

**Level of service (LOS):** The speed, convenience, comfort, and security of transportation facilities and services as experienced by drivers. Level-of-service ratings — typically from A (best) to F (worst) — are widely used in transportation planning to evaluate problems and potential solutions.[2]

**Vehicle miles traveled (VMT):** The amount of automobile travel in a given area over a period of time. In the context of SB 743, VMT is the amount of automobile travel attributable to a project or plan.[4]

**California Environmental Quality Act (CEQA):** A California statute that requires state and local agencies to perform an environmental review to identify any significant environmental impacts of their projects and to avoid or mitigate those environmental impacts, if feasible.[5,6]

**SB 32 (2016):** A California statute that requires the state's Air Resources Board to ensure at least a 40% statewide reduction in greenhouse gas (GHG) emissions from 1990 levels by 2030.[4]

**SB 375 (2008):** A California statute that requires the state's Air Resources Board to set GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Communities Strategies. Beginning in October 2018, targets for the state's largest MPOs call for a 19% reduction in GHG emissions from cars and light trucks (compared with 2005 emissions levels) by 2035.[4,7]

**Significant impact (or significant effect on the environment):** Under CEQA, a substantial — or potentially substantial — adverse change in the environment.[8]

**Threshold of significance:** A qualitative or quantitative limit beyond which an effect on the environment will be deemed significant by a particular agency.[4]

### BASICS OF SB 743

- SB 743 supports California state goals related to reduction of greenhouse gas emissions.
- Traffic delay — as measured by level of service (LOS) — is no longer considered a significant impact under CEQA.
- In CEQA analysis, transportation impacts must be measured by vehicle miles traveled (VMT).
- Agencies that are involved with implementing CEQA (such as city planning departments) have discretion to choose their method for estimating the amount of VMT associated with a project.
- Agencies can begin using VMT for CEQA analysis immediately, but they must begin no later than July 1, 2020.
- SB 743 applies to all transportation projects (pedestrian, bicycle, public transit, vehicle infrastructure) and land use projects (residential, office, retail, etc). The CEQA Guidelines technically do not require roadway capacity projects to use VMT as the metric of transportation impact; however, VMT must be accurately assessed in order to assess GHG, air quality, energy, and noise impacts under CEQA.
- SB 743 also applies to CEQA analysis of plans, including general plans, area plans, specific plans, and regional transportation plans.
- LOS may be used outside of CEQA. However, use of LOS at the project level has been shown to negatively impact the environment, human health, neighborhood livability, and access to destinations.

## Purpose of the guide

For many California cities and counties, making the transition from LOS to VMT will require local governments to shift their existing methods for analyzing transportation impacts, likely adopt new policies, and invest resources to provide education or retraining on transportation analysis. Several cities across California have already made this leap. This guide showcases 5 of those cities: **Los Angeles**, **Oakland**, **Pasadena**, **San Jose**, and **San Luis Obispo**. This review of these "early adopter" cities highlights special considerations, community engagement processes, challenges, and lessons learned that can help to inform local jurisdictions that are just starting their transition to using VMT as a metric. Drawing on those lessons, this document provides how-to guidance on the 3 core phases of the transition to VMT and the roles of various stakeholders in the process. Finally, the guide highlights additional steps that local policymakers can take to address health and equity as they work through this transition process.

This resource was primarily developed for transportation planners, engineers, policymakers, and other professionals or agencies that are involved in implementing SB 743 and CEQA in their daily work. Additionally, we intend that public health practitioners, community groups, transportation advocates, and other stakeholders who are interested in fostering healthier, more sustainable communities can use this resource to identify common goals and opportunities for collaboration with local government officials.

# Why is this transition important for advancing health, equity, and sustainability?

The transition from LOS to VMT is a step forward in advancing environmental, health, and equity goals across California. Using LOS as the standard method of analysis focuses on minimizing traffic delay (though often delays are simply moved to another location), discourages infill development, and requires mitigation measures that prioritize motorist convenience on roads and through intersections, which in turn leads to more driving. Use of LOS in CEQA analysis incorrectly equates low levels of auto delay with preservation of the environment. The result is car-oriented development patterns and limited incentives to build walking, bicycling, and public transit infrastructure.

In contrast, using VMT to measure transportation impacts leads to minimizing of distances traveled in cars. CEQA lead agencies will no longer have to focus solely on driver convenience. Instead, they can focus on whether a project will contribute to other goals, such as reducing greenhouse gas emissions, improving public health, and building vibrant communities. Use of VMT to measure transportation impacts facilitates mixed-use, transit-oriented development (TOD) and infill development while also encouraging multimodal transportation infrastructure. The result is a pattern of development that is healthier, more equitable, and more sustainable.[9]

*Using VMT to measure transportation impacts leads to a pattern of development that is healthier, more equitable, and more sustainable.*

## Advancing climate goals

The state has established ambitious targets to reduce greenhouse gas (GHG) emissions to 40% below 1990 levels by 2030 (SB 32) and to 80% below 1990 emissions levels for the transportation sector by 2050 (Executive Order B-16-12). Complementary to these bills, SB 375 requires each regional planning agency to create a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan. The SCS must outline how the region will meet its GHG reduction targets through coordinated transportation, land use, and housing strategies. Because the transportation sector is the largest source of GHG emissions in California and contributes about half of California's GHG emissions (when fuel extraction, refining, and transport is taken into account), VMT reduction is an essential strategy for meeting climate change goals, even with ambitious deployment of electric vehicles.[10,11] A goal of reducing VMT provides a powerful strategy to achieve multiple community benefits, including mitigation of climate change, by helping to reduce transportation-related GHG emissions, promote alternative modes of transportation, and encourage infill development.

**CALIFORNIA'S GOALS**

40%
BELOW 1990 GREENHOUSE GAS LEVELS BY 2030

80%
BELOW 1990 EMISSION LEVELS BY 2050

## Advancing goals related to healthy, equitable, and active communities

VMT reduction strategies yield a variety of health and equity benefits:

**Increased safety.** Reducing VMT means fewer cars on the road and fewer car trips, which lowers the risk of traffic-related collisions and injuries both for motorists and for people who tend to rely more on walking and bicycling, such as children, the elderly, people experiencing homelessness, people of color, and low-income people.[6] More people out walking and biking in public spaces also increases public safety because more "eyes on the street" can deter crime and increase perceived safety.[12,13]

**Improved environmental quality.** In addition to reduced GHG emissions, less driving results in better air quality and lower rates of asthma.[14] A more multimodal transportation network has less impervious surface area, resulting in less stormwater runoff and less water pollution.[15] Less driving also reduces environmental noise pollution from vehicles.[16]

**Increased physical activity and improved health.** Less time spent in cars is associated with increased physical activity, reduced risk of chronic disease, and improved mental and emotional health.[17,18]

**Improved mental health, reduced stress, and increased community cohesion.** Reducing VMT relieves traffic congestion and time spent commuting, reduces stress related to driving, and allows more time for other desirable activities such as socializing with family and friends, exercising, enjoying hobbies, or fulfilling household or self-care needs.[19] In addition, fewer people in cars and more people walking and bicycling increase interactions between people and build social cohesion, which can result in improved health.[20]

**Increased opportunities for healthy development.** SB 743 creates greater opportunities for mixed-use, infill, high-density, and transit-oriented developments. These developments allow destinations to be closer together and therefore more walkable, more bikeable, and more easily served by transit. As trip lengths get shorter and transit stops get closer to destinations, walking, bicycling, and use of public transit increase.[21,22,23]

**Increased economic opportunity and equity.** Low-income families are less likely to own a car and are more reliant on public transit to meet their daily transportation needs.[24] When combined with provision of affordable housing, mitigation strategies that focus on a mix of uses near transit hubs can increase options for walking, biking, or taking public transit to get to their destinations, especially for lower-income households. Decreased reliance on automobiles for travel also saves people money on gas and the costs associated with buying, operating, and maintaining a car.[25] Affordable housing near transit increases access to jobs and can slow down the pace of gentrification and displacement.[22,26] At the community level, more foot and bicycle traffic has been associated with increased sales for local businesses on those streets.[27]

## Avoiding inequitable outcomes

Making sure that the health and environmental outcomes listed in this section benefit everyone requires an equity-first approach that focuses on communities facing inequities and marginalization. As with any investment, potential trade-offs must be considered. For example, in addition to the benefits described in this section, VMT reduction strategies such as improvements in bicycle and pedestrian infrastructure can increase neighborhood property values. Higher property values can put low-income residents and local businesses at risk of displacement due to increased development pressures, speculation, and higher cost of living.[19] Therefore, it is important to plan and implement VMT reduction strategies in tandem with anti-displacement and renter protection measures.

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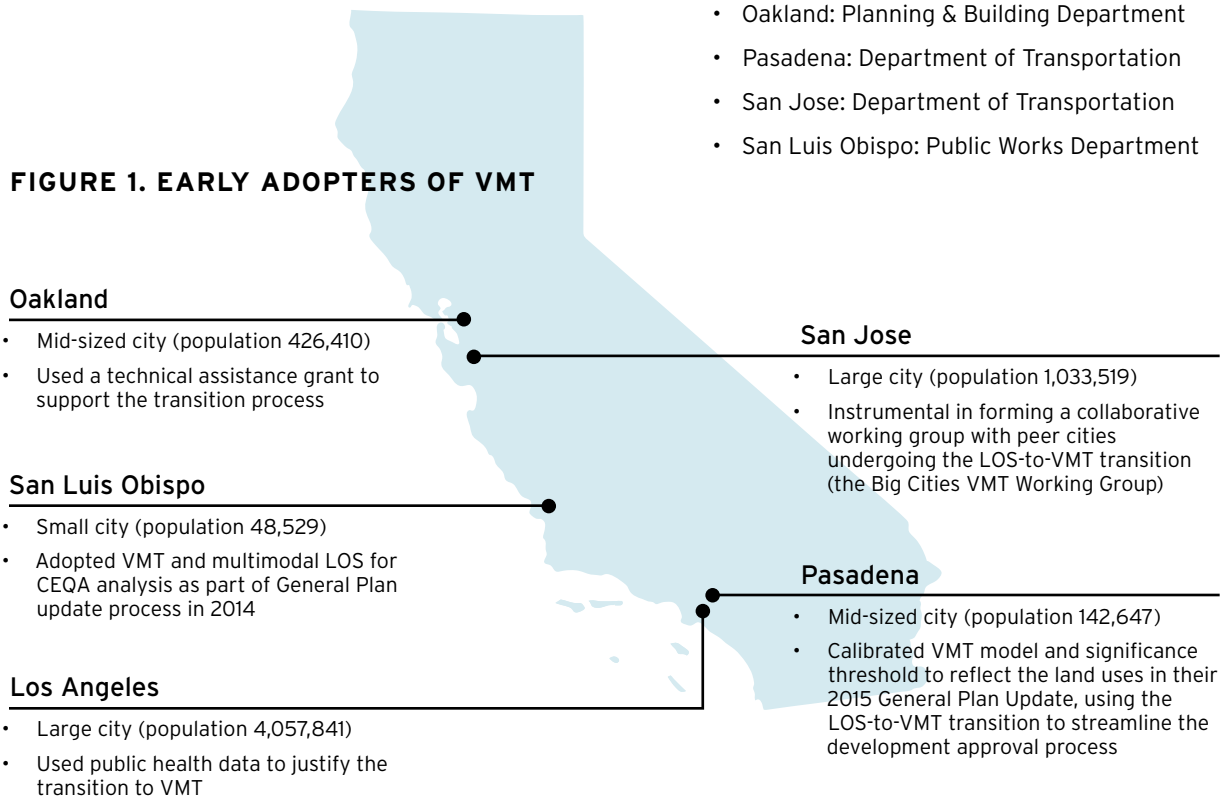
# Early adopters of VMT

The 5 early adopter cities featured in this guide are Los Angeles, Oakland, Pasadena, San Jose, and San Luis Obispo. In 2018, we interviewed city staff in each of these cities about their experiences with making the transition from LOS to VMT and then created case studies, which are included at the **end of this document**. Insights from these interviews underlie the core components of the transition to VMT, lessons learned, challenges, and opportunities featured in this guide. While most of the featured early adopters are mid- to large-sized cities, we hope that the guide provides ideas and approaches that can also be applied in smaller or more rural jurisdictions. Figure 1 summarizes key facts about each city and unique aspects of their transition process.

**Interview participants represented the following city departments:**

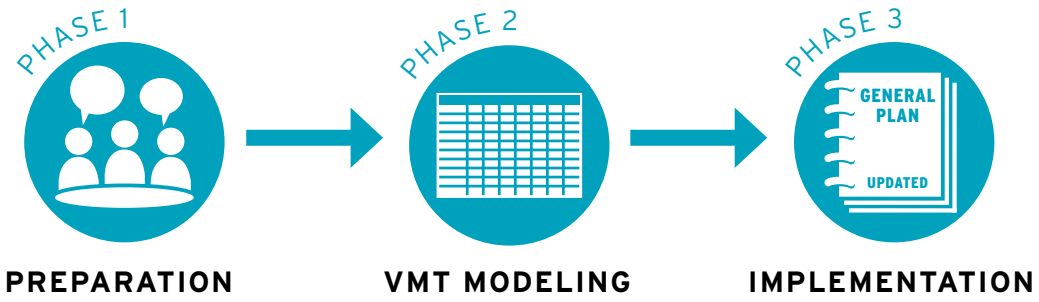
- Los Angeles: Department of Transportation
- Oakland: Planning & Building Department
- Pasadena: Department of Transportation
- San Jose: Department of Transportation
- San Luis Obispo: Public Works Department

**FIGURE 1. EARLY ADOPTERS OF VMT**

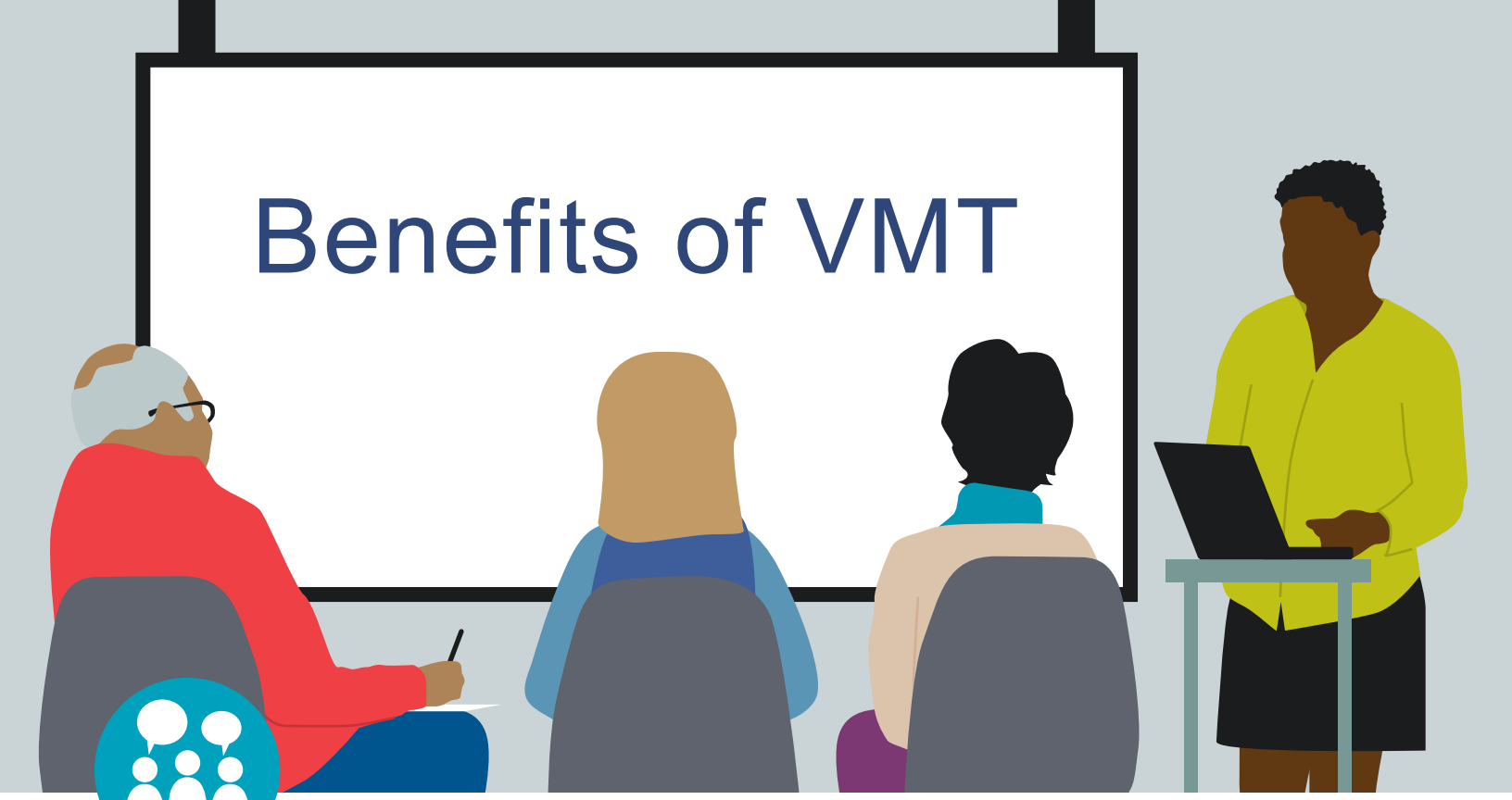


# Overview of phases and stakeholder roles

The transition process from LOS to VMT for transportation analysis can be divided into 3 main phases: (1) preparation, (2) VMT modeling, and (3) implementation. This section describes each phase, lists potential actions that could be taken in that phase, and details the roles of stakeholders in the process. This section shows the range of activities that a city could undertake as part of its transition from LOS to VMT. However, in planning and implementing the transition, cities may not have the need or capacity to do every activity described here.




For additional guidance, refer to OPR's **Technical Advisory on Evaluating Transportation Impacts in CEQA**, which provides recommendations on how to measure VMT, using thresholds of significance, and ways to mitigate VMT.




# Phase 1: Preparation

The first phase includes the actions needed to prepare for transition from LOS to VMT. These include educating stakeholders, reaching out to stakeholders who might be involved with or affected by the transition from LOS to VMT, building the internal capacity of city staff who will oversee the process, and aligning planning or policy efforts with the new method of analysis.

*Articulating the health and equity benefits of measuring VMT instead of LOS can help build support for making the transition.*

## Actions

### Educate stakeholders

Initial education and information sharing across city departments as well as with developers and consultants might be necessary. The goals for these outreach and education efforts could include establishing a shared understanding of the following:

- The requirements of SB 743
- The difference between LOS and VMT
- How the transition will affect analysis of environmental impacts under CEQA
- Potential community benefits and health and equity considerations

Articulating the health and equity benefits of measuring VMT instead of LOS to decisionmakers and stakeholders can help build support for making the transition. Potential benefits can also inform the selection of VMT assessment methods and thresholds of significance (described in Phase 2) and influence how VMT reduction strategies are planned and implemented.

When Los Angeles city staff were starting the process, they felt that they needed to justify the importance of the VMT measure to city councilmembers who might not be familiar with the concept or how VMT reduction could benefit the city. They cited the city's Plan for a Healthy Los Angeles,[28] which provides interactive online maps of the city's public health conditions. Staff were able to use these maps to illustrate the potential positive health ramifications of making the transition from LOS to VMT.

### Engage with stakeholders

All of the early adopter cities took time to reach out to stakeholders (both internal and external to the jurisdiction) who might be involved with or affected by the changes. The goal was to learn about stakeholders' questions or concerns and identify special considerations that needed to be taken into account throughout the process. Stakeholders included the cities' transportation, planning, engineering, public works, legal and regulatory, public health, and city management departments, agencies, or offices and their consultants, as well as elected officials, policymakers, developers, and community-based organizations.

San Jose found that the people who write policy for the city (eg, city councilmembers, the city manager, and their staff) and the people who implement it (eg, planners, engineers, and other technical staff) often have different backgrounds, experience, roles, and responsibilities. The Planning Division found that it was helpful to have extensive training and inter-departmental coordination (eg, meetings, workshops, and training sessions) when they began their transition to VMT. They held regular meetings with other departments (eg, Transportation, Public Works, Environmental Services, and Economic Development) to share knowledge about VMT and obtain guidance to aid development of their VMT estimation methods.

**Who are stakeholders?** Stakeholders might include a city's transportation, planning, engineering, public works, legal and regulatory, public health, and city management departments, agencies, or offices and their consultants, as well as elected officials, policymakers, developers, and community-based organizations.

**What is a lead agency?** A lead agency is the public agency that has primary responsibility for approving a project that may have a significant environmental impact. At the local level, the lead agency is likely the planning, public works, or transportation planning department.[29]

**Who are partners?** Partners are other stakeholders who can support the lead agency. Partners are a subset of stakeholders, and these two groups may overlap.

### Assess internal capacity

It is also important to assess the lead agency's internal capacity to implement the transition — for example, the level of expertise needed and the time required for the analysis.

To support its transition process, San Jose hired a consultant to provide technical expertise and help organize a transition task force. The task force included representatives from the Department of Planning, Building and Code Enforcement and the Department of Transportation.

Oakland applied for a technical assistance grant from the Alameda County Transportation Commission, which allowed them to engage more staff in the transition process rather than putting the task solely on the single staff member who had originally championed the idea.

### Align planning efforts

Consider all planning or policy efforts that are in progress or planned for the near future, such as a general plan update or decisions on development priorities. Aligning the VMT transition with another planning process can help provide structure and allow for a more gradual phase-in of the transition. Applying the new method to an actual project can build consensus and legitimacy for the methods while helping to make sure that those methods and thresholds support other city goals and policies. Using VMT as part of an existing planning project can also streamline community outreach and education efforts.

For example, to build consensus and support for VMT reduction, San Luis Obispo adopted the practice of using VMT and multimodal LOS (which considers LOS for modes other than driving) for CEQA analysis as part of their 2014 General Plan update. The combination of VMT and multimodal LOS helped city staff bridge the gap of public understanding between LOS and VMT. The process helped stakeholders build consensus for identifying goals and policies to increase the use of carpooling, public transit, bicycling, walking, and other sustainable transportation modes.

## Health & equity considerations

As previously discussed, VMT reduction strategies can support healthy environments. But they can also create negative consequences, such as displacement of residents. Including a diverse and representative group of partners, such as local businesses and community-based organizations, can help a city understand the implications of the transition in a more holistic manner. The LOS-to-VMT transition process can also be an opportunity to form or strengthen partnerships for future projects or initiatives.

### STRATEGIES FOR BUILDING DIVERSE PARTNERSHIPS[30]

- Engage community members in a process that is inclusive and representative.
- Reach out to people in other departments, agencies, institutions, and organizations. Ask them about their professional and political interests and motivations.
- Align actions across sectors for collective impact.

## Roles

**Lead agency:** identify stakeholders; coordinate outreach to stakeholders; assess plans and internal capacity.

**Partners:** work to involve a wide range of stakeholders early in the transition process; build relationships and shared knowledge that can contribute to future steps, such as determining thresholds or VMT mitigation strategies.

# Phase 2: VMT modeling

VMT modeling is an important component of the transition process from LOS to VMT. This phase involves 2 key steps:

- Identifying existing and new methods for estimating the amount of VMT that a project will generate
- Deciding on the threshold for how much VMT represents a significant impact under CEQA

OPR's **Technical Advisory on Evaluating Transportation Impacts in CEQA** (Technical Advisory) recommends methods for estimating VMT for different types of projects (retail, residential, and office) and provides methods for determining VMT thresholds of significance that are in line with state goals for reduction of GHG emissions detailed in **California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals**.

## Actions

### Develop or join working groups

Although they were not required to, some of the early adopters participated in working groups with other jurisdictions to share resources, challenges, and experiences in implementing SB 743. San Jose spearheaded the formation of a collaborative group of early adopter cities (the Big Cities VMT Working Group), which had informal bi-weekly phone calls to share resources and discuss issues that the cities encountered. The group included representatives from Fresno, Long

Beach, Los Angeles, Oakland, Pasadena, Sacramento, San Francisco, and San Jose, as well as agencies such as Caltrans, OPR, San Diego Association of Governments, San Francisco County Transportation Authority, San Francisco Municipal Transportation Agency, and Santa Clara Valley Transportation Authority.

### Develop VMT estimation methods

Pasadena did not use the OPR's Technical Advisory for guidance on VMT estimation methods because it wasn't yet available when the city began its transition. However, the other early adopter cities generally used approaches contained in the Technical Advisory and worked in consultation with OPR. They also relied on trial and error and learning from their peer cities to develop their methods. The methods chosen by the early adopters were tailored to their unique needs and local context.

- Pasadena developed a fine-grained, parcel-level travel demand model. This approach provides more accurate VMT estimates than a typical "off-the-shelf" regional travel demand model because it accounts for micro-level effects of the urban form — such as density, land use diversity, and design — that more aggregated models covering larger areas can miss.
- Oakland started by using forecasted VMT estimates from the Alameda County travel demand model. City staff would like to partner with Alameda County modeling staff to design enhancements that will improve the scope and accuracy of their VMT estimation.
- Los Angeles built a spreadsheet-based VMT calculator based on outputs from their city's travel demand model. The calculator is guided by the goals and policies in their Sustainable Communities Strategy, which coordinates regional transportation, land use, and housing strategies.
- San Jose developed a spreadsheet-based VMT Evaluation Tool to evaluate whether proposed land use projects would generate VMT impacts.[31] City staff collaborated with consultants to beta-test the tool.

The Big Cities VMT Working Group continues to meet monthly as a subcommittee of the California City Transportation Initiative (CaCTI) and is open to cities of all sizes. For information about joining the CaCTI VMT Working Group, visit **nacto.org/program/cacti**.

### Determine the threshold of significance for VMT

In VMT analysis, the threshold of significance for VMT is the minimum amount of additional VMT that can be associated with a project or plan before it is deemed to have a significant impact under CEQA. While OPR does provide guidance in their Technical Advisory, lead agencies have discretion to determine their own threshold of significance, as long as it is evidence-based.

- San Luis Obispo used their county's average VMT for its significance threshold because city staff felt this approach was simple, intuitive, and would be well-regarded by colleagues across the state. However, a significance threshold of "average" is not sufficient to align with state science-based GHG emissions reduction goals.[32]
- Oakland used the citywide average VMT (calculated from their county-level travel demand model) for their significance threshold. Oakland chose to use a more stringent threshold (the citywide average VMT is lower than the countywide average VMT) to place greater emphasis on projects and plans that have a minimal environmental impact.
- Pasadena calibrated their VMT model and significance threshold to reflect the land uses adopted in their 2015 General Plan update. As long as a developer adheres to the adopted land uses and plan, their proposed project will not trigger a significant impact. The transition to VMT has streamlined the development approval process by setting clear development guidelines.

In rural areas, fewer options may be available for reducing VMT, and it may be best to determine significance thresholds on a case-by-case basis.[4]

## Health & equity considerations

In addition to VMT and environmental impacts, it can also be helpful to measure the health, equity, and economic impacts of proposed plans and projects in order to understand the full range of benefits and trade-offs. For example, replacing metered parking on a street with a bicycle lane might mean less profit for a city, but it might help reduce VMT by encouraging more active transportation that results in greater physical activity and reduced health care costs. Considering these benefits and trade-offs helps in making decisions about where and how to invest resources.

Agencies may choose to use **screening thresholds** — special criteria that can help decisionmakers quickly identify whether a project is expected to cause a significant impact without conducting a detailed study. In determining VMT estimation methods, the threshold of significance, and screening thresholds, be careful not to oversimplify or make inaccurate assumptions about the circumstances. Incorrect assumptions could result in negative consequences such as approving a type of development that is not wanted by the community or does not align with a community's vision for their city.

## EXAMPLES OF SCREENING THRESHOLDS[4]

- Projects that generate or attract fewer than 110 trips per day generally can be assumed to cause a less-than-significant transportation impact.
- New residential and office projects in the same area that incorporate similar features (such as density, mix of uses, transit accessibility) would likely result in similar levels of VMT. Consequently, all projects may not require a detailed VMT analysis if one of the projects has already been analyzed.
- Projects proposed within a half-mile of an existing major transit stop or an existing stop along a high-quality transit corridor will have a less-than-significant impact on VMT.
- Transit and active transportation projects (such as passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects) generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation.
- Adding affordable housing to infill locations generally makes jobs more accessible to housing, meaning shorter commutes and less VMT.

## Roles

**Lead agency:** consult with partners and stakeholders about options for estimating VMT; determine VMT estimation methods and significance thresholds; gather data.

**Partners (eg, other city departments):** inform decisions made about methods and thresholds by contributing data and providing context for special considerations, such as local and regional travel patterns, housing market dynamics, and development or investment priorities.


# Phase 3: Implementation

This phase involves creating a process for integrating VMT into planning and project development processes. VMT analysis may be implemented through an ongoing planning process, such as a general plan update, or on a project-by-project basis.

## Actions

### Address legacy LOS projects and processes

One decision that cities will need to consider is how to deal with projects that have already undergone CEQA analysis with LOS and are in the development pipeline.

- San Luis Obispo elected to retain LOS as a CEQA measure, side by side with VMT, until SB 743 is required to be fully in force statewide in 2020.
- San Jose set a 30-day transition period after the date that the city council approved VMT as the CEQA measure for transportation impact. During the 30-day transition period, the city could choose to use LOS or VMT on a case-by-case basis. After the transition period, all projects were required to use VMT.
- Oakland carried over previous LOS mitigation projects by doing a supplemental environmental impact report (EIR) in order to replace the old EIR mitigations.

## Health & equity considerations

As part of the transition process, it might be helpful to establish an assessment period of 6 to 12 months (or some other specified time frame). After this period, evaluate how using VMT as the measure of analysis has affected GHG emissions, health, equity, and other outcomes. Based on this assessment, it might be necessary to adjust methods or processes to better align with community goals and priorities.

Los Angeles is integrating the VMT measure into its recently adopted Mobility Plan 2035 (which also serves as their General Plan's circulation element). The plan sets a performance objective of reducing VMT per capita by 5% every 5 years, to reach a total reduction of 20% by 2035. To track progress, the city's planning department is collaborating with the Mayor's Office on Environment and Sustainability, the city council, and the South Coast Air Quality Management District to routinely quantify the total reduction of greenhouse gases and VMT. These reductions will then be recorded in a citywide database where carbon offset credits are tracked for the city's compliance with SB 375, AB 32, and the region's Sustainable Communities Strategy.

## Roles

**Lead agency:** take inventory of planning processes and projects already in progress and determine the best plan of action for the transition to VMT; gather or use existing VMT data to establish a baseline that can be used to establish thresholds of significance.

**Partners (eg, other city departments):** help the lead agency weigh the advantages and disadvantages of different options; update plans, projects, and protocols as needed; provide data to help evaluate implementation outcomes.

# Challenges for early adopters

Common challenges that early adopters of VMT encountered were related to communication and coordination, technical aspects of VMT modeling, and transitions from earlier practices.

## Communicating changes to city staff

One of the common challenges for large cities was making sure that city staff were aware of the transition to VMT. Communicating about the change was a big endeavor, given that new VMT methods would change the ways that multiple departments and numerous staff members went about planning and performing environmental reviews. The early adopter cities continue to research and improve their methods.

*New VMT methods change the ways that multiple departments and staff members plan and perform environmental reviews.*

## Developing VMT estimation methods

Several early adopter cities found that developing VMT estimation methods was more complicated than expected. While several of the cities expanded on existing transportation estimation methods, such as travel demand models, which had established credibility and support from peer-reviewed research over time, those methods had limitations. Because existing models were designed to forecast travel patterns at a regional level, often for the purposes of compliance with air quality regulations, many of them were not sensitive to or reliable for estimating the VMT impacts of small neighborhood-scale land uses, transportation infrastructure projects, or related policies — the scale at which many mitigation measures are likely to have an impact. This limitation makes it difficult to use those types of models to measure the impact of small transportation and land use projects.

## Addressing legacy LOS projects

Almost every city will need to address the legacy of LOS analysis used for environmental impact reports prior to the passage of SB 743. Mitigation strategies adopted for projects under the old LOS-based system do not go away when LOS is replaced with VMT, and many of those strategies are actually detrimental to safe active transportation or interfere with goals for GHG reduction.

# Lessons learned & considerations for cities getting started on the transition from LOS to VMT

The following lessons learned and considerations are synthesized from the successes that early adopter cities have experienced.

## Stakeholder engagement

### Educate partners and stakeholders, even those who initially seem reluctant to adopt the transition

Education and background information about why the switch to VMT is important for health, equity, and climate change goals, as well as a more efficient and cost-effective multimodal transportation system overall, may be helpful to planning commissioners, city councilmembers, and other decisionmakers.

### Make the transition a collaborative effort between city departments from the beginning

Bring in representatives of key city departments as early as possible, including staff from planning, engineering, and city management, as well as elected decisionmakers. As cities make the switch, their legal department should review documents to ensure that CEQA requirements are met.

## Alignment

### Integrate VMT into other plans and policies

Incorporating VMT into ongoing processes helps to build consensus, legitimacy, and community support for the VMT transition.

### Make the public health and equity considerations explicit

Pasadena's city staff did not use public health justifications or research, but in hindsight, they felt that would have been a great set of evidence to use. Oakland's initial motivation to make the transition early was stakeholders' desire to curtail auto traffic and build a more balanced multimodal transportation system. They saw the transition to VMT as an opportunity to accelerate the development of multimodal projects that would benefit the environment and public health in the

community. Los Angeles's staff used extensive research related to health and equity to make the case for adopting VMT as a transportation planning tool. They cited research in the city's 2014 Plan for a Healthy Los Angeles and used interactive online maps to show how VMT could be used as a tool to improve public health outcomes in neighborhoods across the city.

## Assessment of internal capacity

### Get support from other cities and agencies

Early adopter cities found that obtaining technical assistance grants, joining peer working groups, and meeting with OPR and regional partners for guidance were instrumental in their transition process.

## VMT modeling

### Build on existing estimation methods of transportation patterns

Several of the early adopters started with existing methods and tools, such as travel demand models, and enhanced them through trial and error as well as research, improving the accuracy of VMT estimates so that they would reflect micro-level transportation effects of urban form and other contextual factors.

## Implementation

### Expect technical and policymaking challenges, no matter the size of the city

Statewide agencies, such as OPR and Caltrans, can provide guidance and support for the transition to VMT. OPR provides updates and resources related to SB 743 and CEQA on their website. Caltrans offers transportation planning grants that can help support cities in the transition process. Cities can also check with their local and regional planning agencies for additional support.

# Resources

- **Senate Bill 743 legislative information**
- **OPR's website on SB 743**
- **OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA** (December 2018)
- **Caltrans website on SB 743 implementation**
- **California Air Pollution Control Officers Association publication, Quantifying Greenhouse Gas Mitigation Measures** (provides tools for estimating VMT)

**CASE STUDY**

# Los Angeles: Health equity research makes the case for VMT

## Overview

An early adopter of VMT, Los Angeles has embraced a comprehensive approach to their SB 743 transition process, integrating VMT into their existing planning processes to build their constituents' understanding and comfort with these new and still largely unknown methods. This approach has also allowed them to take a gradual path to SB 743 implementation (ie, replacement of LOS with VMT for CEQA analysis), building trust in the methods through ongoing outreach and education activities related to the update of their mobility plan and various community-specific plans. By piggybacking their VMT outreach on these larger, more established planning processes, Los Angeles has been able to build a sense of legitimacy for VMT that would not have occurred if Los Angeles had pursued their SB 743 transition in isolation.

The efficiency and effectiveness of embedding their VMT outreach and education efforts within their larger planning processes were not the only reasons that Los Angeles was an early adopter; they were also motivated by an increasing drumbeat of legal challenges undertaken by California's attorney general against neighboring jurisdictions such as the County of San Bernardino for the lack of any analysis of greenhouse gas (GHG) emissions in their transportation and land use plans and policies. The San Bernardino case, combined with key decisionmakers' and stakeholders' advocacy for addressing transportation's contribution to the city's GHG emissions, motivated city staff to integrate VMT (among other measures) into their planning process prior to the passage of SB 743.

Finally, Los Angeles provides a unique example of SB 743 implementation due to their extensive use of health- and equity-related research to help make the case for adopting VMT as a transportation planning tool. In fact, when city staff were first asked to report to the city council on March 31, 2015, they cited research provided in the city's Plan for a Healthy Los Angeles,[28] using the plan's interactive online maps to show how using VMT as a transportation planning tool would improve public health outcomes in the city's neighborhoods. Later, staff were also able to use this report in their outreach and education process for the transition.

### DATES OF TRANSITION

- 2015: Partial implementation of VMT in citywide planning efforts
- 2018: Full implementation planned to occur by the end of the year

# Transition Process

## Initial Motivations

Los Angeles's motivation for making the transition to VMT resulted from a combination of stakeholder advocacy, strong leadership from key city councilmembers, and what city staff described as a series of wake-up calls on the importance of climate change to California's local governments.

Leading up to the passage of SB 743, key business interests and nonprofit policy advocates (including public health advocates and AARP) helped provide the impetus for city leaders to reform their approach to the CEQA process and encourage development of a multimodal transportation system and supportive land use patterns. This advocacy encouraged and supported several members of the city council (including those who chaired the council's transportation and land use committees) in providing strong leadership for the rest of the council. These VMT champions were valuable assets to city staff as they began to focus on the implications of climate change for Los Angeles — the aforementioned "wake-up calls."

Three events helped focus the attention of advocates, decisionmakers, and staff on the need to address climate change at the city level, in part through using VMT. First, the passage of AB 32, the state's first major regulatory legislation on greenhouse gases, in 2006 drew attention to the importance of climate change as an issue across the state and at all levels of government. Passage of AB 32 was soon followed by passage of California's SB 97, which explicitly required that CEQA analysis include GHG emissions.

Finally, Jerry Brown, the state's attorney general from 2007 to 2011 (who also served 4 terms as California's governor), led an effort to bring lawsuits against local governments that were deemed out of compliance with AB 32. Under Attorney General Brown, the state sued the County of San Bernardino over its general plan because it did not address climate change impacts. As part of the settlement for this lawsuit, San Bernardino County agreed to perform an inventory of all greenhouse gas (GHG) sources, develop projections of GHG emissions in 2020, and set GHG reduction targets for the county's land use and transportation decisions (among others).[33] This and other legal actions taken by Attorney General Brown established legal precedent for challenging local plans for climate issues and provided motivation for local governments to look for GHG-related metrics for local transportation and land use projects — metrics such as VMT. These events were early indications to Los Angeles city staff that GHGs were going to be an increasingly important issue in planning and transportation, motivating them to consider and eventually adopt VMT for planning and environmental analysis.

## Stakeholder/Community Involvement & Outreach

As statewide momentum began to build for the use of VMT in CEQA analysis — a trend that would eventually lead to the passage of SB 743 — Los Angeles already had a head start on their implementation due to the combined efforts of city staff, interested advocates, and key city councilmembers. These stakeholders' interest in the use of VMT as a key GHG metric led to early rollout of the city's VMT metric as an important analysis and policy component of the city's Mobility 2035 plan and its numerous community-specific plans. Consequently, the community outreach and engagement activities undertaken by the city for these plans provided an opportunity to educate the city's stakeholders on GHG emissions and VMT. These early outreach efforts laid a foundation of support for VMT, easing the path for the city's transition to comply with SB 743.

After SB 743 was passed in 2013, some people remained invested in the old LOS metric. Somewhat surprisingly, some of these were community and environmental advocates — people who had developed successful strategies of using LOS to block new developments, either through the courts or by using LOS analysis results to build public opposition to unwanted development projects. As a result, city staff needed to design their transition to VMT in a way that would build support among these LOS holdouts, focusing on the potential benefits of a VMT-based system. To help address the concerns of the most dedicated LOS supporters, they used public outreach opportunities to make sure everyone was aware that the city was keeping LOS to evaluate and manage the performance of the transportation network, just not as part of the CEQA review process.

Overall, the Los Angeles community has responded well to the combined outreach efforts for VMT and the city's mobility and community planning processes. So far, community members seem to view VMT as providing more complete information about transportation impacts on the environment than was available when LOS was used.

## Getting the Process Started

Los Angeles, like other early adopters of SB 743, began their transition to VMT by building support among community stakeholders through outreach and education efforts. Los Angeles made important early strides in these efforts by combining the public involvement processes for VMT and their mobility plan. This combined process served both purposes, providing legitimacy and relevance for VMT in the eyes of the public while offering a new method of measuring GHG emissions (using VMT) to the transportation planning process.

## Methods of Calculation & Model Development

To encourage acceptance and appreciation of VMT as a transportation performance measure independent of the CEQA process, Los Angeles has increased understanding of and support for VMT's use as a substitute for LOS by integrating VMT calculation methods into their existing transportation modeling methods. The following uses of VMT for planning efforts have helped build support through development and refinement of VMT calculation methods:

First, Los Angeles has been working on building a spreadsheet-based VMT calculator for use in project-level CEQA analysis based on outputs from their city's travel demand model. These efforts also inspired enhancements to the city's travel demand modeling process, leading to improvements in the city's transportation planning processes overall. As of the date of this case study's interview, Los Angeles is in the final stages of testing the beta version of their calculator. Transportation planning practitioners (consultants) have tested and used it, and the city is updating the model to incorporate their feedback. Projects will be run through the VMT calculator, which uses the factors (coefficients) that were developed through running and improving the travel demand model.

Partially inspired by their efforts in developing the spreadsheet calculator, Los Angeles has also made VMT more relevant to the city's planning process by researching and developing methods for estimating the trip generation VMT of proposed affordable housing projects. Previous research has shown lower VMT and trips for affordable housing, but this research is not reflected in the current Institute of Transportation Engineers' *Trip Generation Manual*, the resource typically used by transportation planners to estimate the amount of traffic a new development project will cause. The findings of this research are now being integrated into the city's VMT estimation methods as well as their travel demand model.

Finally, Los Angeles is building its VMT methods for CEQA analysis in order to support the goals and policies of their Sustainable Communities Strategy (SCS). By using the transportation and land use policies from the SCS as their impact significance yardstick for CEQA, they have set up a system in which the goals of the SCS and the city's other plans and policies mutually support each other, helping to ensure that future growth occurs in the way that the plan envisioned. In cases when there is a difference between the SCS and the growth proposed, Los Angeles will use the city's travel demand model to determine the VMT differences between the SCS and the plan they are working on.

## Health & Equity Implications

Of the cities surveyed for this research, Los Angeles is unique in their city staff's extensive use of health- and equity-related research in their SB 743 transition process. When staff were slated to report to the city council on the subject for the first time, they felt that they needed to justify the importance of the VMT measure to councilmembers who might not be familiar with the concepts and how VMT measures and policies could benefit the city. In their report, staff cited the city's Plan for a Healthy Los Angeles (March 31, 2015).[28] One of the first of its kind in the nation, the plan provided online interactive maps of the city's public health conditions. City staff used the maps to examine how transit service areas correlated with community health and equity index scores from the Plan for a Healthy Los Angeles and how the SB 743 transition would lead to lower VMT, more infill development, and lower barriers in the approval process for development, all while enhancing public health and equity. Staff were also able to use the report they had created in their outreach and education process for the transition.

Finally, because city staff were aware that one of the original uses of LOS was to identify carbon monoxide (CO) hot spots that present a significant public health challenge, they decided early in the transition that they would need to address public and decisionmaker concerns about dropping LOS from CEQA analysis. To address these concerns, staff began a discussion with the city council, which led to an official motion in August 2014 that directed staff to evaluate the extent of the CO hot spot problem in Los Angeles. This effort led to a report to the council in January 2016 showing that CO hot spots are not currently a problem in the city and that the problem was not likely to increase if they decided to stop using LOS for CEQA review.

# Valuable Lessons

### Implementation Challenges & Lessons

**Get ready, it may take a while!** Los Angeles's experience with their transition to VMT suggests that other governments starting their transition process should be prepared for a long haul. According to Los Angeles Department of Transportation staff, "The most important thing to understand when starting this process is how long it will take!" On the other hand, Los Angeles is a big city, so it is likely that it has taken longer to get agreement throughout their large city administration than it would for a smaller jurisdiction. Nevertheless, Los Angeles city staff are happy with how things have developed so far, even though it has been a long and involved process.

**You won't regret doing your homework.** VMT is a new way of looking at transportation, and a lot of it may seem like a black box unless you educate yourself about previous methods as well as the new VMT-based methods. New adopters should acquire and review as much information as they can about current methods of transportation analysis in their jurisdiction.

## Advice for Getting Started

**Take advantage of the research done by early adopters.** Los Angeles, San Jose, and other early adopters have done a great deal of background research on how to design and implement VMT policies and methods for CEQA analyses. Other jurisdictions that are just starting out on their transition path should take full advantage of this work.

**Generate and distribute information to stakeholders, to build trust.** Work to gain the trust of your community stakeholders by generating and disseminating information about how your VMT methods were developed and how they work.

**When possible, generate VMT from local data.** People familiar with the basics of transportation planning practice may be aware that the Institute of Transportation Engineers' *Trip Generation Manual* and other standard practice methods are based on national data that might not be relevant under local conditions, so it is advisable to develop as much local information as possible to engender trust in the new VMT methods. Basing VMT on local data will help build support for VMT in your jurisdiction.

**Keep using LOS for non-CEQA purposes, to build trust in your transition.** Build public support for your VMT transition by keeping LOS-based analysis as a part of your development review process while removing it from CEQA analysis.

**CASE STUDY**

# Oakland: Staff & stakeholder motivation propels VMT implementation

## Overview

While it is not unusual for city staff to be important players in an effort to make a major change in municipal policies and procedures, Oakland's recent history as an early adopter of VMT places their staff center stage as a prime mover in the transition from LOS to VMT. A testament to the power of individual, staff-level initiative, Oakland's transition to VMT was started by a motivated staff member in their Department of Transportation (DOT). Since then, the transition process has grown to become a multi-departmental collaborative effort, spanning the planning, transportation, and city attorney's offices. The original staff member got the transition process rolling by applying for and winning a technical assistance grant from the Alameda County Transportation Commission, allowing staff from DOT and the Building & Planning Department (hereafter referred to as *Planning*) to devote work time to planning and implementing the transition and in doing so, broaden support for his nascent effort among Oakland's municipal employee stakeholders.

This story of staff initiative, however, would not have been a successful one without the support of Oakland's residents. In fact, staff's VMT initiative was also inspired by citizen stakeholders who wanted to make major changes to proposed transportation projects around the city in order to limit automobility and enhance the safety and performance of alternative modes. However, the reductions in LOS that these projects would have caused would also have triggered the city's CEQA significance standards, possibly requiring mitigations for these projects that would have diluted or eliminated their traffic-calming effects. As a result, stakeholders and staff began to consider replacing LOS with VMT as a comprehensive way to improve the prospects for projects that would calm traffic and enhance alternative modes of transportation across the city.

It seems unlikely that Oakland's staff or residents would have been able lead the charge and successfully replace LOS with VMT without Oakland's flexible approach to CEQA administration. In contrast to other California cities, Oakland's policy in regard to CEQA is that the selection of significance thresholds and calculation methods are administrative decisions that do not require council or commission adoption. This policy provides staff with significant flexibility to design analysis methods, including new VMT metrics, that can change with changing demands from the city's leaders and residents.

### DATES OF TRANSITION

- September 2016: Staff received direction from the planning commission to remove LOS as Oakland's method of CEQA analysis and replace it with VMT.
- April 2017: VMT analysis became the requirement for CEQA analysis.

# Transition Process

## Initial Motivations

Oakland's VMT transition was initiated in the DOT by a planner/engineer who was interested in being in the forefront of this developing statewide effort. To kick-start the transition process, this staff member applied for and won a technical assistance grant from the Alameda County Transportation Commission (Alameda CTC). This grant money proved decisive in broadening interest in and commitment to the transition effort from just the original staff member to staff from 3 key city departments (Planning, DOT, and the City Attorney's Office), giving the initiative more staying power. As a result, when the DOT's VMT champion left his position with the city, DOT and Planning took on co-equal responsibility for advancing the initiative.

Once the process began, the 2 departments shared responsibility for developing the transition plan and implementing it. Planning was involved because, according to an Oakland staff member, Planning is "the keeper of the city's CEQA significance thresholds." At the same time, DOT staff were interested in moving toward VMT because they saw how it would support their agenda of pursuing multimodal and non-auto transportation projects that would incur delays for full environmental impact reports (EIRs) if LOS analysis was required. They wanted a more desirable set of outcomes in terms of safety and public health than the CEQA system had provided when LOS was used for analysis.

For example, for one high-profile set of projects that had originally been identified in Oakland's 2002 Lake Merritt Park Master Plan,[34] some voices in the city were calling for making larger trade-offs in favor of facilities for non-motorized modes (in other words, being more ambitious in taming car traffic around the lake) than had originally been envisioned. Ten years earlier, the plan's conceptual changes concerning Lake Merritt had been studied in its EIR, but years later, when the pre-analysis was getting started for individual projects, the thinking in Oakland (among both city staff and the public) had evolved such that more ambitious traffic-calming measures were now acceptable and even desirable. A consensus had developed that it was desirable to remove more lanes of travel from the lake's surrounding streets than had originally been envisioned in the Lake Merritt plan. However, these traffic-calming design changes would have required additional

CEQA analysis that would have triggered use of the city's LOS standards and a full EIR. The likely outcome was that the changes would add years to the projects and possibly require mitigations that would be at odds with the new, more ambitious aims of the projects.

Due, in part, to the desires of Oakland's stakeholders to curtail auto traffic and build a more balanced multimodal transportation system in their city, staff and citizens alike began to consider replacing LOS with VMT as a comprehensive solution. Oakland stakeholders realized that with VMT in place, they could use CEQA to propel these multimodal projects forward, benefiting the environment and public health in their community.

## Stakeholder/Community Involvement & Outreach

Once DOT and Planning were on board and committed to Oakland's transition to VMT, staff from both departments began to build support for VMT by interviewing CEQA-related stakeholders within the city, key partner agencies, and consultants. Interviews included staff from the city's Economic & Workforce Development Department, transit agencies, transportation consultants, DOT, and Planning, as well as the city's attorneys who worked on issues related to CEQA and land use.

These interviews identified concerns that VMT would not be an effective tool for identifying and communicating traffic issues and impacts to the public. To put it simply, LOS was designed to identify local traffic impacts on specific road segments and intersections, while VMT is more suited to act as a citywide or regional measure of traffic impact. As a result, some stakeholders voiced concerns that the public would resist the transition. In particular, stakeholders were concerned that VMT would not be useful as a tool to identify "cut-through traffic" that might divide Oakland's residential neighborhoods.

Some stakeholders also voiced concerns that Oakland has never properly measured impacts affecting transit services. These stakeholders wanted to make sure that the issue would be properly addressed with VMT. As a result, Oakland used the VMT transition process as a point of entry to larger discussions about how their entire development review process (CEQA and non-CEQA) could be improved so that nothing would fall through the cracks.

## Getting the Process Started

Like other SB 743 early adopters, Oakland began their transition to VMT by building support among stakeholders. One important way that city staff built support as they were getting started was by applying for and securing a technical assistance grant from the Alameda CTC. They then used this grant to fund DOT and Planning staff time to conduct interviews with stakeholders. Through the interviews, they were able to build support for the transition to VMT while also identifying potential roadblocks to implementation from key stakeholders.

## Methods of Calculation & Model Development

The City of Oakland is currently developing a beta version of their VMT estimation methods, using forecasted VMT estimates from Alameda County's travel demand model. But even with the head start they gained by working with an established modeling platform, Oakland found that the VMT modeling was more difficult than expected. Consequently, they are planning to engage with Alameda County's modeling staff to design enhancements that will improve the scope and accuracy of VMT estimation.

Oakland's approach to significance thresholds is similar to San Luis Obispo's, using averages from their countywide (Alameda CTC's) travel demand model to guide their significance thresholds. However, while San Luis Obispo uses a countywide average, Oakland uses a more stringent (lower) significance threshold: the citywide VMT average derived from Alameda CTC's travel demand model. When a project's per-capita VMT equals or exceeds the citywide average, the project is determined to have a significant impact. City staff compare the projected VMT per capita for the project with the average for Oakland from the Alameda CTC model; if the project's VMT is projected to be lower than the citywide average, then the project is determined to have no impact.

As for long-term (cumulative) VMT forecasting, Oakland is considering using the countywide model as well but has not yet developed the ability to make changes to the model to forecast the future impacts from adding proposed projects. Currently, city staff use forecasted VMT averages for land uses that are comparable to the proposed project in Oakland to estimate VMT for the project in future years. To date, Oakland has not had explicit conversations with the Alameda CTC or the Metropolitan Transportation Commission (the Bay Area's metropolitan planning organization and the originator of the county's travel demand model) about how to forecast for future conditions.

# Health & Equity Implications

Like many of the cities featured in this case study analysis, Oakland did not explicitly look at public health issues related to LOS and VMT during their transition period. However, city staff did make arguments that the unintended consequences of the LOS methods were detrimental to public health. A planner from Oakland characterized these as "common sense" arguments and did not explicitly mention public health and transportation research literature. For example, while Oakland city staff talked about air pollution and safety in a general way with CEQA stakeholders and the public, they did not feel the need for research to back up these points. Answers to follow-up questions about why they did not need this research support for their stakeholder outreach indicated that stakeholders and staff already understood the health (and other) benefits of moving to a VMT-based system, so city staff did not feel the need to make research-based arguments about public health.

# Valuable Lessons

## Implementation Challenges & Lessons

**Legacy LOS mitigations lingered.** Once you convert your CEQA process to VMT, LOS will almost certainly continue to have a lingering legacy. Oakland city staff consider themselves to still be in the transition process because issues continue to arise. One issue that has come up is dealing with the legacy of the LOS system from prior EIRs. They quickly realized that the mitigations adopted for projects under the old LOS-based system did not just go away once they replaced LOS with VMT. For example, the CEQA analysis and EIR for a new Safeway at 51st Street and Broadway using the old LOS analysis and standards indicated that Broadway needed a new turn lane, but the city and many community members thought this would be bad for safety and pedestrians. However, they realized that they could not just eliminate those old EIR mitigation measures, so they might have to go through a public process to remove the mitigations.

City staff members have different views on how to address the issue of legacy LOS mitigations. One view is that the city needs to do a supplemental EIR to remove the old EIR mitigations. Others think they just need to create an administrative-level memo to file that documents their reasons for dismissing the old mitigations, thereby bypassing the need to do additional EIR analysis and receive city council approval. One of Oakland's planners said that this debate is one of Planning's biggest challenges right now. At this point, it seems likely that they will decide which of these two approaches to use on a case-by-case basis. In one recent case, they removed a mitigation measure from the Capital Improvement Program and went to the planning commission to get approval. In other cases, they believe that a memo to file will suffice.

**LOS was still needed for analysis of air quality and noise.** Eliminating LOS for transportation analysis did not completely eliminate the need to use LOS as part of noise and air quality analysis for CEQA. Therefore, it is important for cities to realize that their transportation staff will likely need to continue supporting the use of LOS even after it is replaced by VMT for CEQA analysis of transportation system impacts.

**Busy staff needed help to undertake the transition.** At the beginning of their process, planning and other city staff were already overwhelmed with work duties, so adding the VMT transition effort to their plates would have made success difficult. The technical assistance grant the city received from the Alameda CTC was helpful because it gave staff the space to step back from their normal duties and projects in order to plan and execute their transition strategy. Luckily, the grant application required by the Alameda CTC was relatively simple to prepare and did not require a lengthy proposal.

## Advice for Getting Started

**Be prepared to take a deep dive into CEQA and the technical aspects of estimating VMT.** Oakland city staff found that the VMT estimation methods they developed were more complicated than they'd thought they would be at the beginning of their transition journey. Staff often had to delve deeply into CEQA to learn about its requirements. Understanding the other topic areas for CEQA analysis (eg, air quality and noise) was crucial because of the many connections between transportation analysis and these other areas, which meant that the transition to VMT would likely affect them as well.

**Engage stakeholders on the city staff early.** Oakland recommends that cities make sure that planning staff, transportation staff, and city attorneys are all engaged early and often as partners in the transition process. Given that a transition to VMT affects other departments beyond planning, lean toward forming a collaborative effort between affected departments rather than designating just one department to be responsible for everything.

**CASE STUDY**

# Pasadena: VMT metrics match general plan uses

## Overview

Among the earliest of VMT early adopters, Pasadena has blazed a trail to SB 743 compliance for the rest of the state's local governments. In 2015, almost exactly 2 years after SB 743 was signed into law by the governor, Pasadena adopted VMT as 1 of 5 environmental indicators to replace level of service (LOS) for transportation and land use policies, plans, and projects as part of their Transportation Impact Analysis Guidelines.

Pasadena adopted several metrics for CEQA review:

- VMT per capita
- Vehicle trips per capita
- Proximity and quality of bicycle network
- Proximity and quality of transit network
- Pedestrian accessibility

Pasadena's pioneering work in using VMT in CEQA analysis was born from an early realization among residents, elected officials, and city staff that their city's goals of developing transit-supportive land use patterns and a multimodal transportation system were being undermined by auto-oriented LOS-based CEQA analysis. Their motivation for adopting VMT as a metric of transportation system performance did not come from external pressure — ie, the state's SB 743 mandate — but from their own aspirations and common vision for the future of their community.

Despite their enthusiasm, Pasadena did not rush into replacing LOS with VMT for CEQA analysis but started using it for non-CEQA purposes such as policy analysis for their General Plan. In this way, when SB 743 became law, Pasadena already had years of experience in using it. Even with this history and experience, their transition still required substantial outreach and education efforts by city staff to ensure sufficient political and staff support for phasing out LOS and replacing it with VMT — an indication that other cities should consider committing even more staff time and resources to lining up stakeholder support.

### DATE OF TRANSITION

September 25, 2015: implemented in the city's Transportation Impact Analysis Guidelines[35]

# Transition Process

## Initial Motivations

Starting roughly in 1994, the city began to focus development toward transit-oriented development (TOD) infill sites and away from existing neighborhoods as a way of ensuring that people would be able to circulate without owning a car. This strategy resulted in a number of successful transit-oriented developments in Pasadena, but staff and council members increasingly noticed that their LOS-based CEQA metrics were antithetical to the development of a multimodal transportation system.

## Stakeholder/Community Involvement & Outreach

As one of the first VMT adopters in the state, Pasadena began stakeholder and community outreach well before SB 743 was drafted; these efforts were part of advancing TOD as a citywide growth strategy, beginning in the early 1990s as the city developed General Plan updates and other transportation-related planning efforts. Workshops and educational outreach activities began in 1994 as part of the General Plan update, which included substantial efforts to advocate for changes in the use of and reliance on traditional auto-based LOS methods. Pasadena's use of multimodal LOS and, eventually, VMT as a replacement for LOS gradually increased as city staff pointed out to their city's decisionmakers and other stakeholders that if they wanted to adopt TOD growth strategies near Gold Line and other transit stations, then they needed to address the negative impacts of LOS on walking, cycling, and transit access. This vision — to focus Pasadena's future growth in TOD areas — would be impossible to implement unless they developed alternative methods of measuring transportation's impacts on the environment.

## Getting the Process Started

As mentioned earlier, Pasadena's transition to using VMT as a transportation performance metric started in the 1990s, when it became increasingly apparent that their vision of building a balanced multimodal transportation system was being thwarted by their use of LOS. In the years that followed, they experimented with alternative methods of measuring automobile impacts on the environment, including VMT. These early efforts to find an alternative to LOS set the stage for their official transition period to VMT for CEQA analysis. This transition started roughly 3 years before SB 743 became law, when they adopted the 2010 *Highway Capacity Manual*'s multimodal LOS methods as a replacement for the traditional intersection-based (auto-only) LOS methods for CEQA review. Using multimodal LOS during the early part of their transition allowed them to educate staff, decisionmakers, and the public about the LOS trade-offs between autos and other modes. After several years of using multimodal LOS, Pasadena's decisionmakers and other stakeholders had developed substantial experience with and understanding of these trade-offs and were ready to start using VMT and the other metrics listed in the Overview section as replacements for both the traditional auto-based LOS and its interim replacement, multimodal LOS.

In 2010, Pasadena began their 5-year LOS-to-VMT transition period, so that by the time they were starting their 2015 General Plan Update, they had already adopted VMT per capita as one of the official metrics in their city's Traffic Impact Analysis Guidelines. In parallel with this transition, staff also gained experience in using VMT by employing it as one of the key metrics informing their 2015 General Plan Update.

### Methods of Calculation & Model Development

Pasadena's early adoption of VMT as a transportation planning metric meant that they had few peer agencies or guidelines to look to for help with implementation. When the Governor's Office of Planning and Research (OPR) released initial draft implementation guidelines for SB 743 in 2014,[6,36] Pasadena was already in the final year of their 5-year transition period, so they found little in the way of usable guidance from this early document. However, to ensure that their methods and policies would comply with SB 743, Pasadena city staff were in regular communication with OPR.

Since one of Pasadena's first uses for VMT was to analyze their General Plan updates, it makes sense that Pasadena designed 2 of the most important elements of a VMT method — the significance thresholds and the VMT calculation tool — to match their General Plan's land uses. By calibrating their significance thresholds and their model to reflect the land uses adopted in the 2015 General Plan Update, they have effectively used SB 743 to streamline the approval process for development. In effect, as long as a developer is adhering to the adopted plans and land uses, their proposed project should not trigger an impact.

Pasadena's fine-grained, parcel-level travel demand model also provides more accurate VMT methods than the typical model because it accounts for the micro-level effects of urban form (ie, the "D's": density, design, diversity) that more aggregated models can miss. This fine level of detail also makes their VMT estimates more sensitive to transportation demand management (TDM) measures, allowing Pasadena to test TDM policies and programs as CEQA transportation impact mitigation measures.

## Valuable Lessons

### Implementation Challenges & Lessons

**Loss of a few development projects.** Pasadena has lost a few opportunities for development in cases when developers did not want to make land use changes to their proposed projects in order to reduce VMT and conform to the General Plan and zoning or when they did not want to take TDM measures to mitigate their impacts. However, given that these proposals generally did not fit with the General Plan, zoning, and other city policies, the city tends to view these losses as preferable to approving projects that do not fit with the city's vision for itself.

**General satisfaction with VMT as a replacement for LOS.** Since LOS-based CEQA analysis often generated significant impacts for transportation projects that improved access and circulation, most staff at the Pasadena Department of Transportation are happy that they do not have to use LOS for CEQA anymore.

## Advice for Getting Started

**Educate!** Pasadena engaged in a continual process of educating policymakers, staff, and the public, providing updates on development of their VMT metric and reminding everyone that the goal of the transition is to have a better multimodal transportation system. Staff found that it was more effective to show stakeholders how the VMT metric and associated policies are in their interest than to impose VMT by fiat. For cities that are beginning their VMT transition, it is important to keep their messages about VMT simple and positive, given that city staff may not be equipped to effectively deliver a complicated message.

**Use research on public health benefits.** Pasadena did not use public health justifications or research in their transition, but in hindsight, city staff feel that this would have been a great set of evidence to use. Research on obesity rates and the health benefits of active transportation would be excellent tools for creating a positive message on the benefits of VMT-based methods and policies.

**CASE STUDY**

# San Jose: Learning from others fuels improvement of VMT methods

## Overview

The City of San Jose's VMT methods and associated policies are technically ambitious and comprehensive — an approach befitting this energetic early adopter of VMT for CEQA analysis. And while many who are similarly ambitious might get bogged down in their own research, realizing too late that their analytic goals were set unrealistically high for the resources and time available, San Jose has matched its high expectations with dogged determination and substantial resources and time spent on researching and building consensus for sophisticated VMT policies and methods for CEQA analysis.

As a result, San Jose's approach to VMT calculation is still a work in progress, despite its adoption of VMT as the metric for CEQA analysis of transportation in February 2018. City staff continue to research and improve their methods, working to establish more effective methods for estimating the effects of transportation demand management (TDM) strategies, neighborhood-scale transportation infrastructure, and land use decisions. San Jose is constantly working to evaluate new research and, when appropriate, integrate it into their easy-to-use VMT Evaluation Tool, which they make available to developers, consultants, and the public to help estimate the effects of their proposed projects on the transportation environment.

### DATE OF TRANSITION

February 27, 2018: adopted by city council

## Transition Process

### Initial Motivations

An early adopter, the City of San Jose first formally used VMT as a transportation performance metric in its 2011 General Plan in conjunction with a goal of reducing VMT citywide by 40%. With this early start, San Jose was well positioned to start development of their VMT methods for SB 743 implementation shortly after the law was passed and signed by the governor in 2013. To get things moving

quickly and foster internal collaboration, the city hired a consultant to provide technical expertise and organized city stakeholders into a transition task force with representatives from the city's Planning Division and their Department of Transportation (DOT).

## Stakeholder/Community Involvement & Outreach

Starting in 2015, San Jose started mapping out their implementation of VMT and identifying how these changes would affect the city's CEQA-related activities, hiring consultants to study the implementation choices (in terms of calculation methods and associated policies). Because VMT was already in their General Plan and Urban Village (specific) Plans, much of the outreach, education, and consensus building for VMT had been done in previous years.

## Getting the Process Started

As mentioned previously, because VMT had already been included in city plans, it took very little time to reach consensus with stakeholders on the outlines of the methods, metrics, and implementation timeline for SB 743 transition. San Jose city staff scheduled approval of their SB 743 transition plan to take place at the city council meeting on February 27, 2018. At this meeting, VMT was adopted as the city's official measure of transportation impact for CEQA analysis, with a 30-day transition period. During that period, the city could choose which method to use — LOS or VMT — on a case-by-case basis. After the 30-day period was over, all projects would be required to use VMT for CEQA analysis. Getting the word out to other city staff sometimes required a great deal of effort for San Jose city staff, who had to work closely with staff in various departments of the large city operation, educating them about how SB 743 and the new VMT methods would change their processes for planning, projects, and environmental review.

## Methods of Calculation & Model Development

San Jose staff recognized early that the key to a smooth SB 743 transition would be committing time and resources to research, analysis, and design of an effective and fair VMT calculation method. Furthermore, they realized that they could multiply the benefits of their time and resource investments by seeking knowledge, perspectives, and collaboration from other jurisdictions. In doing so, San Jose worked to form an ongoing collaborative, the Big Cities VMT Working Group. This informal group of large cities has been sharing resources and experiences on their SB 743 implementation efforts, meeting bi-weekly by phone to talk through the various issues each party has encountered and discussing how each party has dealt with them. According to a DOT staff member, "This was an incredible resource." A recent in-person meeting of this group hosted presentations from jurisdictions around the state on how they are addressing key methodological challenges of VMT estimation.

In addition, San Jose city staff routinely sought the advice and guidance of the Governor's Office of Planning and Research (OPR), the entity responsible for developing the state's CEQA guidelines implementing SB 743. The city staff found that OPR's guidelines[37] do an excellent job of pointing out the big issues that may be encountered in the SB 743 implementation process and providing useful examples of policy language and calculation methodologies for SB 743 implementation.

To make calculation of VMT as easy as possible while also encouraging consistency and accuracy, San Jose and its Big City partners have developed a calculation spreadsheet (VMT Evaluation Tool) for project VMT estimates. Developers (or their consultants) run the VMT Evaluation Tool for their projects, and then San Jose's DOT checks for quality and completeness. As part of their effort to collaborate with their stakeholders, the city also had consultants beta-test the VMT Evaluation Tool.

## Health & Equity Implications

While health and equity considerations are not explicitly referenced in their implementation documents, San Jose's VMT implementation team would often discuss and consider how the use of VMT as a CEQA measure might help produce transportation and land use policy decisions and infrastructure investments that could improve public health and equity. Indeed, according to a DOT staff member, the influences of land use and transportation infrastructure and design on active transportation mode share and air quality (both health and equity concerns) were always "a subtext" during the research and development of their VMT estimation methods.

# Valuable Lessons

## Implementation Challenges & Lessons

**Different perspectives require training and coordination.** Since San Jose was an early adopter of VMT methods in their planning process, there wasn't much policy language or many methods that they could borrow from other jurisdictions. However, this early start also gave them time to develop the methods and policies for VMT that would best suit their own needs as a city with diverse stakeholders. To make sure they were on track to develop the policies and methods that would attract the most support from their community when it came time for implementation, San Jose engaged in significant and ongoing stakeholder outreach and coordination activities, such as public meetings, as well as workshops with city staff, developers, and transportation planning consultants. From these efforts, city staff soon realized that because, for instance, the people in city government

who write policy and those who implement it often differ in background, experience, roles, and responsibilities, it was important to provide extensive training and inter-departmental coordination while developing and implementing their policies and methods for SB 743 compliance. City staff held regular and numerous meetings with staff in other departments to let them discuss and help guide the methods development.

**Dialogue with stakeholders provides valuable feedback.** Keeping developers and the public informed about the changes resulting from the transition to VMT and how they might be affected was critically important to maintaining support for the transition. City staff knew that the transition to VMT would affect each community and stakeholder group in different ways, making it difficult for the city to anticipate the reactions of all those affected. As a result, city staff decided that they had to be very open about the development of the VMT Evaluation Tool and let the critics pick it apart. In the long run, this open-book policy helped build stakeholder confidence.

**Different VMT estimation methods need to be made accurate and consistent.** Just as city staff found deep diversity of experience within their ranks, they also came to realize that there was a great deal of diversity in the methods and models the city has developed over time to estimate VMT. Typically, there are several models in use within a region (or even within a single jurisdiction) that will produce different VMT estimates for the same project, so there is often a need to coordinate and develop consistency across these models. Furthermore, as a DOT staff member bluntly put it: "The available models do not estimate VMT very well." These shortcomings mean that San Jose (as well as many other cities across California) has faced challenges in trying to implement a set of VMT estimation methods that are both accurate and sensitive to key policy and planning variables (eg, urban form, bicycle lanes, sidewalks). To address these shortcomings, staff scoured the research information available and worked with other cities and researchers to shed light on these unknowns.

**SB 743 forces you to think regionally.** The transition process also quickly brought home to San Jose city staff that they would need to think more regionally. Because VMT impacts are regional by nature, it is important to understand that SB 743 forces local governments to think and act regionally. This experience has led San Jose to consider a county-level transportation impact fee program to help them manage and mitigate regional impacts.

## Advice for Getting Started

**Gather your partners.** Make sure you have all the right players in your city at the table. Within a city's government, relevant players often include personnel from planning, legal, engineering, and city management departments, as well as elected decisionmakers. Representatives from these departments can provide much-needed feedback on how policies and procedures can be shaped to ensure that the transition to VMT goes smoothly, yielding the maximum possible benefits for the city and its residents. Partners from outside city government will be important

as well. Gather interested consultants, advocates, and other interested parties, and give them as much of a voice in your transition design and implementation as possible. The goodwill you build from these outreach efforts will help you when you are seeking political and public support as you go before your elected representatives to finalize your transition from LOS to VMT for SB 743 compliance.

**Line up policymaker support.** Make sure you have the backing of your policymakers, and make sure they know how difficult this process can be.

**Commit resources.** Identify and commit resources to the transition. Do not shortchange yourself. San Jose dedicated considerable staff time to work on their transition research and plans over the years and supplemented these staff with consultant contracts for more technical analysis as needed. Money as well as staff time will likely be needed if your VMT calculation methods require changes to your city's travel demand model or other calculation tools.

**Identify and involve good technical help.** Make sure you have good technical people involved in your transition planning and implementation.

**Get help from other jurisdictions.** Reach out to other cities and counties for guidance and help in your transition process. Work regionally to pool resources and benefits. San Jose's work with the Big Cities VMT Working Group is an example of how the costs and benefits of research on VMT calculation can be shared. Furthermore, San Jose has been talking with neighboring jurisdictions about analyzing impacts in a more coordinated fashion and, because "impacts don't pay attention to borders," looking for ways to share the costs and benefits of project mitigations regionally.

**CASE STUDY**

# San Luis Obispo: Keeping it simple eases VMT implementation

## Overview

The City of San Luis Obispo's path to success with its VMT transition is perhaps best characterized by the KISS principle — keep it simple and straightforward.[38] There are many paths the city could have taken, but for San Luis Obispo (SLO), keeping it simple meant incorporating VMT into their existing planning processes as a first implementation step, using the methods recommended by the Governor's Office of Planning and Research (OPR) for calculation and identification of significant impacts, and using their existing travel forecasting models to estimate VMT. So far, SLO has incorporated VMT into 3 city plans: the 2014 General Plan update, the Bicycle Transportation Plan update, and the citywide sustainability plan.

Incorporating VMT into the process for the 2014 General Plan update helped build consensus and support for VMT in the city. At the time, OPR's VMT guidelines had not yet been released, so SLO adopted VMT as well as multimodal LOS for CEQA analysis as part of the 2014 General Plan update. This combination of methods helped city staff to bridge the gap between LOS and VMT in the public's understanding and in the process helped stakeholders build consensus for identifying goals and policies to increase non-single occupant vehicle (SOV) mode share. As a result, SLO was successful in including an ambitious goal in the General Plan update that seeks a 20% bicycling mode share.

Since its first use of VMT in the General Plan update, SLO has managed to keep their VMT calculation methods relatively simple and straightforward, allowing a quick and relatively easy transition process so far. This simplicity also meant that after using VMT for the first time in their General Plan update process, they were able to quickly write up new Transportation Impact Analysis Guidelines within a few months.

### DATES OF TRANSITION

- 2014: adopted VMT (and multimodal LOS) for CEQA analysis as part of General Plan update process
- 2020: LOS will be removed from CEQA analysis (after full VMT implementation statewide), to avoid litigation that might result from earlier removal of LOS

# Transition Process

## Initial Motivations

SLO's motivation for becoming an early adopter came in part from a growing consensus among the city's residents and stakeholders for increasing non-SOV mode share. City stakeholders wanted to adopt methods for use in the General Plan update that would push the conversation toward reaching that goal. Accordingly, they adopted VMT for CEQA analysis in 2014 as part of the General Plan update, just after SB 743 was adopted by the state.

As stakeholder engagement work for the General Plan update progressed, the city and its stakeholders began to develop a common understanding of how the old LOS-based analysis methods were leading them to adopt more auto-oriented mitigations, often to the detriment of projects that sought to develop a more balanced, multimodal system. As stakeholders became more comfortable with VMT, they began to see how VMT would allow them to avoid auto-oriented LOS-based mitigations. According to city staff, using VMT gave the city and its stakeholders a lens through which to view SLO's transportation impact challenges, offering insights that eventually led to establishment of a hierarchy of mode priorities for certain areas within the city. This new policy allows them to balance their CEQA impact mitigations across all modes and supports a Complete Streets approach to planning and engineering for transportation-related capital improvements.

## Stakeholder/Community Involvement & Outreach

SLO's early integration of VMT into their planning process and associated outreach activities made for a smooth and politically well-supported transition process. SLO's first VMT-related outreach activities were part of their General Plan update process. The consensus developed during the update focused on increasing the city's non-SOV mode share. During this process, VMT proved to be an excellent public outreach tool that planners could use to communicate the travel outcomes of transportation and land use options resulting from stakeholders' policy discussions.

As described earlier, VMT also played an important role in the General Plan update process, illuminating how the old LOS-based system was encouraging more auto-oriented project mitigations, which in turn would lead to more VMT, which would then encourage more auto-oriented mitigations — a cycle that was leading SLO toward a future of ever-increasing VMT. Nevertheless, stakeholder support for the mode shift goal and use of VMT in the planning process was not universal. As their process progressed, SLO planners noted that there was still support for the old LOS-based system of CEQA review among some stakeholders. To avoid potential conflict and litigation during their transition process, SLO decided to maintain their CEQA system of multimodal LOS in parallel with their implementation of the VMT metric until SB 743 was fully in effect in 2020. This gradual process is seen as a way to build community members' comfort with the transition while also providing the city with an added layer of protection from any LOS-based lawsuits that might occur before the state's mandated switch in 2020.

## Getting the Process Started

SLO began their transition by quickly integrating VMT into the various upcoming and ongoing planning processes they were managing in 2014. In doing so, they were able to build a sense of comfort with and value for the role that VMT could play in the city's planning process. Stakeholders' familiarity made the eventual introduction of VMT into CEQA analysis a relatively smooth process.

## Methods of Calculation & Model Development

SLO's overall approach to measuring VMT for CEQA analysis can generally be characterized as simple and straightforward, but not simplistic. Because OPR's guidelines were not yet available in 2014 when SLO started their transition, staff initially had a relatively free hand to define their calculation methods in a way that fit their city's needs and policy goals. However, such freedom was risky because the methods SLO developed could easily have strayed from those under development by OPR and other cities around the state. Nevertheless, SLO was able to avoid this pitfall by holding periodic meetings with OPR staff and other industry leaders (such as the Association of Environmental Professionals), ensuring that their city's methods would be compatible with those being developed elsewhere in the state. As a result, their VMT methods and policies are largely in line with OPR's now, and it is the city's intention to follow OPR's guidelines.

Selecting a threshold of significance is another crucial decision for cities engaged in SB 743 transition. SLO selected the county's average VMT as their threshold of significance criterion because they felt it was simple, intuitive, and well regarded by colleagues across the state. It is simple because all planners need to do is estimate a project's VMT and then compare it with the county's average; when project VMT is higher, the impact is significant, and when it is lower, it is not.

Project-generated VMT in SLO is estimated by using the city's travel demand model to apply average per-trip VMT estimates from comparable land uses to the proposed project and then multiply the number of trips the project will generate by the average VMT per trip.[39] This simple and straightforward calculation method primarily employs methods that had previously been used for LOS analysis, making it relatively easy to educate policymakers and the public on the new method.

For future analysis, SLO chose to routinely calculate VMT for CEQA analysis using an enhanced version of their city's travel demand model — an approach that has the dual benefit of using an already established calculation method while applying additional resources and energy to improving it. One improvement was to add transit and bicycle travel estimation capabilities to this model, making it sensitive to infrastructure and policies that would entice people out of their cars and into buses or onto their bikes.

SLO planners have also worked over time to make the model more accurate at neighborhood and person scales of analysis — for example, by designing its transportation analysis zones to be as small as possible so that it can capture the micro-level effects of urban form. SLO has also instituted a frequent, rigorous, and

detailed process for updating the model that captures and accounts for micro-level changes as soon as they occur. Their approach to model calibration also helps capture neighborhood effects by calculating and adjusting small-scale factors that fine-tune the model's VMT estimates for each neighborhood's unique context.

Overall, this straightforward approach to calculating VMT also yielded benefits to staff down the road, making it quick and easy to update their Transportation Impact Analysis (TIA) guidelines document a few short months after completing their General Plan update. Furthermore, because they will not eliminate their multimodal LOS measure from CEQA analysis until 2020, when SB 743 takes full effect statewide, all staff needed to do was add a few short sections to their TIA guidelines that explained these simple calculation procedures.

# Valuable Lessons

## Implementation Challenges & Lessons

**Concerns that VMT misses some transportation system impacts.** As they gained more experience in working with VMT as part of their General Plan update process, stakeholders and staff noticed important pluses and minuses, compared with LOS. Part of what LOS does well is informing elected officials and the public about transportation system impacts — something that VMT does not do well. Stakeholder concerns about this shortcoming led SLO to continue using LOS for their development review process, although it will eventually be dropped from their CEQA analysis procedures. This strategy allows continued transparency about the transportation impacts of proposed projects.

**Concerns that VMT impacts are difficult to mitigate.** SLO's experience as an early adopter suggests that more research and development work is needed to identify mitigation measures that will have a clear and significant connection[40] with the VMT impacts of the project being analyzed and proposed. For example, rural areas may find it difficult to identify practical mitigations for the VMT impacts of projects because driving long distances is often the only choice for rural residents. As a profession, we need to come to grips with how mitigations can be required without using overriding considerations.

**Vulnerability to legal and other challenges.** Based in part on the shortcomings discussed earlier (ie, the weakness of VMT in detecting transportation system impacts), SLO was concerned that removing LOS might make the city vulnerable to legal challenges and increase the difficulty of their full transition from LOS to VMT for CEQA analysis. On the other hand, they also believed that removing LOS would have a large impact on the type of mitigations required as a result of the CEQA process, gradually moving the city toward a more balanced, multimodal transportation system.

**Elimination of LOS.** As suggested earlier, cities run the risk of alienating those in their community who value LOS by prematurely dropping it from CEQA analysis. However, SLO anticipates that they will have more administrative flexibility in defining their mitigations once they drop LOS, eliminating one factor that leads to an auto-oriented transportation system. In general, they expect that removing multimodal LOS from CEQA will give them more favorable options for mitigations and conditions of approval.

## Advice for Getting Started

**Be transparent with your community.** SLO recommends that those getting started with their transition to VMT be as transparent as possible with community members and other stakeholders — and inform them early. By being up-front with their community early in their transition process about the changes that would result from replacing LOS with VMT for CEQA analysis, SLO established a relationship of trust that made the transition easier and more in tune with the community's aspirations.

**Continue to use LOS after VMT CEQA transition.** SLO recommends that in the interest of transparency, cities continue to use LOS for non-CEQA analysis as a tool for communicating the impacts of proposed developments on transportation systems.

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