SB 743 Implementation Decisions for the City of Cupertino: DRAFT

Prepared for:
City of Cupertino

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Executive Summary

On September 27, 2013, Governor Jerry Brown signed SB 743 into law and started a process intended to fundamentally change transportation impact analysis under the California Environmental Quality Act (CEQA). Specifically, the legislation directed the State of California's Office of Planning and Research (OPR), which oversees CEQA compliance, to consider different metrics for identifying transportation impacts and make corresponding revisions to the *CEQA Statute & Guidelines*. The goal of this legislation and the pursuant change in metrics was to reform transportation impact analysis such that it was more in line with other statewide goals pertaining to infill development, reduction of greenhouse gases (GHG), and promotion of public transit and active transportation.

As a result of changes to the *CEQA Statute & Guidelines,* there are several changes in general transportation impact analysis metrics, methods, and thresholds. As a lead agency, the City of Cupertino will need to make several policy decisions to implement these changes. This report discusses the background of the changes and provides detailed technical information pertaining to decisions the City will need to make. The **Summary of Decisions, Options, and Recommendations**, presented as **Appendix A** and in the matrix at the end of this Executive Summary, provides an abbreviated overview of this white paper's contents and corresponding action items and decision points.

Background

VMT will replace vehicle delay as an indicator of environmental impacts.

At its core, SB 743 removes the use of vehicle level of service (LOS) as an indicator of environmental impacts under CEQA. LOS is a traditional measure of vehicular delay, or the additional driving time encountered by drivers during congested time periods. Instead of measuring vehicle delay, OPR recommends considering a project's effect on total vehicle miles traveled (VMT).

VMT can briefly be described as the product of a project's vehicle trip generation and the average length of those trips. For instance, if a project generates 100 daily vehicle trips, each with an average length of five miles, that project generates 500 daily VMT.

VMT is related to many of the externalities created by vehicle travel. In gasoline or diesel-powered vehicles, VMT is directly related to total GHG production and other tailpipe emissions. VMT also serves as an indicator of total regional congestion by measuring how much traffic a project is generating on a macroscopic scale.

However, VMT does not accurately predict changes such as increased delay at intersections near a project, or how traffic will affect roadways immediately surrounding a project, in the same way traditional traffic analysis would. It is more focused on how efficiently designed and located a land use project might be;

whether the project is located near a wide variety of jobs, housing, or retail uses; and whether alternative modes of transportation are available.

As a lead agency, the City must make several key policy decisions to comply with SB 743.

Because reporting the VMT associated with a given project or plan requires a different method than traditional traffic analysis, the City will need to set clear guidelines and expectations for how a VMT analysis should be conducted. With the *CEQA Statute & Guidelines* expectations for an environmental impact analysis in mind, this white paper discusses seven questions, grouped by the specific decisions about VMT metrics, VMT calculation methods, VMT significance thresholds, and VMT mitigation actions.[1] We highlight options and limitations for each question from a technical transportation planning and engineering perspective, with a particular emphasis on addressing the *CEQA Statute & Guidelines* expectations for an environmental impact analysis. In particular, there are seven core policy questions that must be addressed, across four general topic areas:

1. **VMT Metrics**: What form of VMT metrics could be used?
2. **VMT Calculation Methods**: What methods are available to use in estimating and forecasting VMT?
3. **VMT Impact Significance Thresholds**: Is the use of VMT impact screening desired? What is the VMT impact significance threshold for land use projects and land use plans under baseline conditions? What is the VMT impact significance threshold for land use projects and land use plans under cumulative conditions? What is the VMT impact significance threshold for transportation projects under baseline and cumulative conditions?
4. **VMT Mitigation Actions**: What VMT reduction mitigation strategies are feasible?

Each of these questions is discussed in greater detail in its own section of this white paper. Those sections are summarized below.

VMT Metrics

VMT Measured and Expressed in Multiple Ways

The first decision facing the City of Cupertino is which VMT *metric* to use to express a project's transportation effects. VMT metrics fall into two general categories: absolute VMT and per capita VMT. Per capita VMT is also referred to as an efficiency metric, as it does not vary directly with project size. Based on our example above, if a project generates 100 daily trips at an average of five miles per trip, the *absolute* project generated VMT is 500 vehicle miles per day. If that project is a small office employing 25 people, the per capita VMT is 20 VMT per employee (a per capita or VMT efficiency metric).

Table ES-1 summarizes the common VMT metrics available to the City.

[1] Typical CEQA practice focuses on environmental effects that occur on a typical weekday, so all references to VMT in this white paper are intended to mean VMT that occurs on a typical weekday.

Table ES-1: Summary of Common VMT Metrics

VMT Metric[1,]	Definition	Recommended by OPR[2]	VMT Used for Other CEQA Sections?
Total Project Generated VMT	Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, presented as a total project generated VMT.	Yes, for land use plans, and discussed in Appendix 1 of the OPR *Technical Advisory*.	Yes
Total Project Generated VMT per Service Population[3, 4] (also "Total Project Generated VMT Rate")	Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, divided by the sum of residents plus employees in the analysis area generating the VMT.	No, although may be helpful for mixed-use projects and comparing land use scenarios, particularly when using a travel forecasting model.	Yes
Home-Based VMT per Resident (a partial VMT estimate) (also "Home-Based VMT Rate")	VMT generated by light-duty vehicles (i.e., private cars and trucks) for all trips that begin or end at a residential land use, divided by residents.	Yes, for residential projects on page 5 and Appendix 1 of OPR *Technical Advisory*.	No
Home-Based Work VMT per Employee (a partial VMT estimate) (also "Home-Based Work VMT Rate")	VMT by light-duty vehicles only for work trips (that is, trips that have one end at a workplace and one end at a residence), divided by number of employees.	Yes, for office projects on page 6 and Appendix 1 of OPR *Technical Advisory*.	No
Project's Effect on VMT within the Boundary of a Specific Area (also "Boundary VMT")	VMT that occurs within a selected geographic boundary (e.g., City, County, or region) by any type of vehicle. This captures all on-road vehicle travel on a roadway network for any purpose, and includes local trips as well as trips that pass through the area without stopping.	Yes, for retail projects and transportation projects on pages 5, 6 and 23 and Appendix 1 of the OPR *Technical Advisory*.	Yes

Notes:

1. Each VMT metric is an option for baseline and/or cumulative impact analysis.
2. With the exception of Total Project Generated VMT per Service Population, each VMT metric listed in this table are described in the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018). See pages 5, 6 and 23, and Appendix 1 of the OPR *Technical Advisory*.
3. Total project generated VMT is derived from this VMT rate.
4. The project generated VMT accounting is similar to an origin-destination accounting used for many Climate Action Plans.

Source: Fehr & Peers, 2020.

Total VMT and Partial VMT

Total VMT metrics include all types of VMT captured by a travel forecasting model, regardless of the type of vehicle or the trip's purpose. In practice, this means the metric includes visitor trips, medium-duty and heavy-duty vehicles, public transit buses, and other types of vehicle miles that might not be captured in the most common partial VMT metrics. Partial VMT refers to the use of only particular trip purposes and/or vehicle types for assessing a project's impacts. The efficiency metrics recommended by OPR for use in analyzing office and residential projects are partial VMT metrics, because they include only light-duty passenger vehicles and only trips for a specific purpose or made by a specific population.

The benefits of partial VMT metrics are as follows: They allow for sketch-level analysis using findings from a prior model run; they are easier to understand and visualize; and for single land uses that are similar to existing development patterns, they are likely reflective of the same impact patterns as would be present with analysis of total VMT. Understanding where built environment conditions lead to VMT-efficient residential and workplace activity is substantial evidence that could help support conclusions that adding similar land uses to those areas would create similar outcomes. For projects that may be subject to further scrutiny, only reporting a portion of VMT from select trip purposes and limiting the VMT to light-duty vehicles could be considered an incomplete analysis of VMT.

Project Generated VMT and Project's Effect on VMT

VMT metrics also differentiate between project generated VMT and a project's effect on VMT. Project generated VMT is similar to current transportation impact analysis practice of using daily trip generation: to estimate the daily project generated VMT, the daily trips are multiplied by the distance traveled by each daily vehicle trip. The project's effect on VMT instead evaluates the change in total on-road vehicle travel within a geographic area boundary before and after the project is built (referred to as boundary VMT in this white paper). An often-cited example of how a project can affect VMT is the addition of a grocery store in a food desert. Residents of a neighborhood without a grocery store have to travel a great distance to an existing grocery store. Adding the grocery store to that neighborhood will shorten many of the grocery shopping trips and reduce the VMT to/from the neighborhood. While the new store itself will "generate" many daily trips, in that there will be many cars coming in and out of the store's driveway, it will generally attract those trips *away* from other grocery stores located farther away. If the boundary VMT in the area served by all the local grocery stores were to be assessed, it is likely that the total amount of driving in that area will have decreased rather than increased.

Key Take-Aways

In deciding what form of VMT metric to use, the City should consider the following options:

1. Total Project Generated VMT
2. Total Project Generated VMT per Service Population[2]

[2] Service population includes residential population plus employment and may include students or visitors; it is intended to include all independent variables used in estimating trips.

3. Household Generated VMT per Resident (requires an activity/tour-based travel forecasting model)
4. Home-Based VMT per Resident (a partial VMT estimate)
5. Home-Based Work VMT per Employee (a partial VMT estimate)
6. Project's Effect on VMT within the Boundary of a Specific Area (Boundary VMT)

Metrics such as Home-Based VMT per Resident and Home-Based Work VMT per Employee represent partial VMT (i.e., some vehicle types and trip purposes are excluded from the calculation). This may be acceptable for screening purposes, but not for a complete VMT impact analysis. When selecting VMT metric(s), it is useful to keep in mind that the expectation of CEQA is to disclose the potential effects of a project on the environment and the practical consideration of using the same (or different) VMT metrics for the various topic sections of an environmental analysis – transportation, air quality, greenhouse gases, and energy consumption.

VMT Calculation Methods

VMT Calculation Using Several Methods

The most common method of calculating the VMT metrics listed in **Table ES-1** is through a travel forecasting model. A travel forecasting model uses specialized software and is designed to reflect the interactions between different land use and roadway elements in a large area. The two travel models most commonly used to assess projects in Cupertino are the Santa Clara Valley Transportation Authority (VTA)-City/County Association of Governments of San Mateo County (C/CAG) Bi-County Model ("VTA Travel Model") and Travel Model One ("MTC Travel Model"), which is maintained by the Metropolitan Transportation Commission (MTC) and used for large-scale regional planning efforts. There is also a statewide model developed by Caltrans, though the level of analysis is at such a large scale that it is typically used to evaluate interregional travel and freight movements rather than localized land use changes.

In some cases where a travel model is not available or not appropriate, VMT can be estimated using sketch models or spreadsheet tools. VMT may also be estimated directly by multiplying the number of trips by an average trip length. Trips can be estimated using the results of local trip generation surveys or trip generation rate data published by the Institute of Transportation Engineers (ITE). Trip lengths can be extracted from models or from standardized averages or travel pattern data from the regional or sub-regional planning organization. Using trip length averages does not consider changes to the roadway network or to traffic congestion, or the project's potential effects on overall travel patterns. These non-model "accounting methods" could also be paired with a travel model and used between major model updates or to estimate project generated VMT for small projects that would "get lost in a model."

Key Take-Aways

Practically speaking, the use of a travel model is preferable for projects large enough to be accurately represented in that model. In areas under the City of Cupertino's jurisdiction, use of the VTA Travel Model

is most appropriate for this analysis. **Appendix B** summarizes the activity-based (also called tour-based) Metropolitan Transportation Commission (MTC) travel forecasting model and the trip-based VTA-C/CAG Bi-County travel forecasting model ("VTA model"), including their analytical strengths and weaknesses.

Some limitations of these methods include the following:

- Statewide and regional models have limited sensitivity and accuracy for local scale applications off the shelf.
- Regional and local models often truncate trips at model boundaries.
- Sketch and spreadsheet tools do not capture the "project effect on VMT."

For smaller projects, use of a non-model "accounting method" may be more appropriate due to their scale and ease of use. The City may wish to set guidance as to which types of projects will generally be required to perform VMT analysis using a travel forecasting model, and which can be performed using non-model "accounting methods" (if any). One potential planning tool that may be appropriate for most small- to medium-sized projects is the forthcoming Santa Clara Countywide VMT Estimation Tool under development by the VTA.

VMT Impact Significance Thresholds

The City has discretion to decide what constitutes a significant impact to the environment.

SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts to drivers, to measuring the impact of driving. The City has discretion to set its significance threshold for VMT impacts, provided that the basis for that threshold is grounded in substantial evidence (see **Chapter 1** Introduction chapter, **Chapter 5** VMT Impact Significance Thresholds, and **Appendix D** for additional details). With regard to establishing thresholds for VMT, lead agencies have at least four options:

1. **Use Screening Criteria**. The concept of project screening is that some projects have characteristics that readily lead to the conclusion that they would not cause a VMT impact, and therefore could be screened out of doing a detailed VMT analysis. Some types of screening criteria include proximity to transit, site located in a low-VMT area, local-serving retail, transportation projects that do not add capacity, and projects with no net VMT increase.
2. **Rely on the OPR Technical Advisory suggestion to set thresholds consistent with state goals for air quality, greenhouse gas (GHG), and energy conservation.** The OPR *Technical Advisory* contains suggested VMT thresholds. The basic suggested threshold is that each project achieves a VMT level that is at least 15% below baseline conditions for the region. In the case of the City of Cupertino, its "region" would most likely be the nine-county Bay Area, and baseline conditions would be VMT as estimated under Existing Conditions (for instance, as calculated by the VTA Travel Model).

3. **Use a threshold adopted or recommended by another public agency consistent with lead agency air quality, GHG reduction, and energy conservation goals.** The *CEQA Statute & Guidelines* offer the option for an agency to use a threshold that is adopted or recommended by another agency, as long as that decision is supported by substantial evidence. Other state agencies, such as Caltrans and the California Air Resources Board (CARB), have technical expertise that is relevant to this topic.

   Recent CARB publications have identified that new land use projects could contribute to meeting these statewide goals by achieving total project generated VMT levels of at least 14.3% below the existing baseline (the CARB report does not specify whether this "baseline" is the regional average or some other baseline). For light-duty vehicles only, CARB cites a 16.8% reduction below baseline (2018) average VMT. However, the CARB analysis assumes that all of the regions in the state will meet the GHG reduction targets set in their Regional Transportation Plans and Sustainable Communities Strategies (RTP/SCS); thus far, indications are that not all regions are meeting those targets, and vehicular travel in California (at least prior to the COVID-19 pandemic) has been increasing rather than decreasing over the past several years. Further, the CARB analysis does not account for any future increases in the use of Transportation Network Companies (such as Uber and Lyft) or commercial delivery services, nor does it envision the potential for development of autonomous vehicles or any other emerging transportation innovations. Therefore, there is growing evidence that the VMT reduction values from the CARB publication may not be enough to actually meet the State's GHG goals. Should current VMT generation trends persist, the threshold may need to increase to 25% below baseline (2018) average of jurisdiction (all vehicles).

   Caltrans has released draft guidance endorsing the VMT thresholds published in the OPR *Technical Advisory*. Caltrans does acknowledge that each lead agency has the discretion to set its own significance thresholds, and they will be reviewing the evidence presented by any agency that uses a threshold that differs from those in the *Technical Advisory*.

   Separately, Caltrans has released draft Interim Guidance on "*Determining CEQA Significance for GHG Emissions for Projects on the State Highway System*" that *recommends that any increase in GHG emissions would constitute a significant impact*. This has been referred to as the "Net Zero VMT Threshold." While Caltrans has thus far signaled that this threshold would be applied only to transportation projects, it does raise a question about whether a "net zero VMT" threshold should also be applied to land use projects and plans.

4. **Develop jurisdiction-specific VMT thresholds consistent with the existing General Plan.** Agencies may decide to set their own thresholds, which should be supported by substantial evidence and should support the three objectives laid out in SB 743: 1) reducing GHG emissions, 2) encouraging infill development, and 3) promoting active transportation. The process of setting thresholds should consider the policies and standards set in the Regional Transportation Plan (RTP)/ Sustainable Communities Strategies (SCS), and should consider how much priority the City wants to place on the statewide GHG reduction goals. A targeted

study could determine what level of VMT in Cupertino would be consistent with the VMT forecasts presented in Plan Bay Area and would represent the City of Cupertino's "fair share" of the State's GHG reduction goals. Another option for setting a local threshold is to consider what level of VMT reduction is feasible to achieve in the local context.

Key Take-Aways

While it is difficult for a lead agency to determine what level of VMT change is unacceptable when viewed solely through a transportation lens, there are several possible options, depending upon if the City chooses to set a threshold based on local or state policies. Options include the following:

1. Set thresholds based on state goals.
    a. Rely on the OPR Technical Advisory suggestion to set thresholds consistent with state goals for air quality, greenhouse gas and energy conservation.
        i. OPR 15% below baseline average of a city or region (light-duty vehicles only)
2. Use a threshold adopted or recommended by another public agency consistent with lead agency air quality, GHG reduction, and energy conservation goals.
    a. CARB 14.3% below baseline (2018) average of jurisdiction (all vehicles, presuming that MPOs meet SB 375 targets)
    b. CARB 16.8% below baseline (2018) average of jurisdiction (light-duty vehicles only, presuming that MPOs meet SB 375 targets)
    c. CARB: 25% below baseline (2018) average of jurisdiction (all vehicles, presuming that MPOs do not meet SB 375 targets).
    d. Net zero VMT
3. Set jurisdiction-specific threshold consistent with existing General Plan.
    a. Set jurisdiction-specific VMT threshold based on substantial evidence.
    b. Set thresholds based on baseline VMT performance.

VMT Mitigation Actions

The nature of transportation impact mitigation under CEQA will likely change.

Mitigating a LOS impact typically involves making changes to the physical transportation system in order to accommodate additional vehicles and reduce delays. These mitigations may involve actions such as installing traffic signals, adding turn lanes, widening roads, or contributing to the construction of HOV/Express Lanes, among other options. The identification of necessary mitigations resulting from project impacts has historically led to project sponsors identifying and funding these changes to the transportation system (i.e., paying a "fair share" contribution toward funding a new traffic signal or widening an existing roadway).

The use of VMT as a metric focuses on the total *amount* of driving, rather than the driving *experience*. Four possible mitigation approaches are described in the VMT Mitigation Actions chapter:

- VMT Cap
- VMT Based Impact Fee Program
- VMT Mitigation Bank
- VMT Mitigation Exchange

A VMT Cap can be developed and administered on a project-by-project basis, while the remaining three options (VMT Based Impact Fee Program, VMT Mitigation Bank, and VMT Mitigation Exchange) are program approaches to impact mitigation. The concept of a 'program' approach to impact mitigation is commonly used in a variety of technical subjects, including transportation, air quality, greenhouse gases, and habitat. Transportation impact fee programs have been used to help mitigate cumulative vehicle level of service (LOS) impacts. What is new is developing a fee program based on VMT impacts and alternative programs – VMT Mitigation Bank and VMT Mitigation Exchange. Absent these new program-level mitigation approaches, rural and suburban lead agencies will have limited feasible mitigation options for project sites.

Use of Vehicle Level of Service for Non-CEQA Analysis

The City of Cupertino has options to continue studying a project's effects on vehicle delay.

Communities place a high value on the information about traffic and transportation presented during a project's review process. Historically, much of the transportation analysis associated with new development or proposed land use plans has occurred under the umbrella of CEQA. However, with this new process, many of these guidelines and analyses may instead occur during development review as part of the City's land use review process for proposed projects.

The City may decide to maintain a level of service standard in its General Plan Circulation Element, and may continue to administer programs to collect impact fees that can be used for roadway improvements. However, these will no longer be subject to CEQA environmental review and potential litigation. Instead, this analysis and any related agreements would need to be performed and presented during land use review of proposed project, for example with regard to General Plan consistency. Any fees assessed to help ease the effects of a given project would be required to conform to State requirements for impact fees and present an appropriate study that documents the nexus between the impact and the fee assessed.

Other Core CEQA Tenets Remain Unchanged.

While this report focuses on the adoption of VMT as a metric for assessing transportation impacts, many other facets of CEQA practice remain unchanged. Transportation impact sections must still discuss other impact categories such as hazards due to design features, effects on emergency access, and conflicts with

a program, plan, ordinance, or policy affecting transit, bicycle and pedestrian facilities. In addition, the City will continue to have the opportunity to comment on EIRs prepared for consideration by other lead agencies if those EIRs may affect areas in the City's jurisdiction.

One particular consistency to note is that the option to "tier" CEQA analysis will remain. The tiering process consists of streamlining topics studied for a project if that project was assessed under a previous EIR. A classic example of this is the development of a single parcel that is consistent with a previously analyzed Specific Plan. The project need only analyze those items which were not previously analyzed. This practice will also apply to VMT analysis, provided the EIR from which the project tiers also studied VMT. In the near term, this may result in tiered projects requiring supplemental VMT analysis; however, in the future, projects that are consistent with a cleared General Plan or Specific Plan may not be required to undergo the full VMT analysis process.

Taking the Next Steps

The immediate next steps for the City of Cupertino as a lead agency are to provide staff and applicants with guidance pertaining to each of the questions posed above. Fehr & Peers has presented an initial assessment of the City's options, and has discussed each in greater detail in the body of this report; however, the decision on how to answer each implementation question must ultimately be made by the City. The **Summary of Decisions, Options, and Recommendations,** presented as **Appendix A**, provides an abbreviated overview of this report's contents and corresponding action items and decision points.

It is very important to understand that the implementation of SB 743 is just beginning across the state for many lead agencies. Current CEQA practices have developed over several decades as a result of a large body of case law and periodic updates to the *CEQA Statute & Guidelines*. Because SB 743 implementation is brand new, there is not yet any case law to guide our understanding or interpretation. The following represents our current understanding of the issues and options involved, informed by our research into SB 743 and knowledge of past CEQA practice; this understanding will evolve over time as more agencies apply SB 743 concepts to their own CEQA procedures. It is recommended that legal counsel be consulted as part of this SB 743 implementation process.

Chapter 1. Introduction

The City of Cupertino SB 743 implementation will provide guidance on and set policies regarding the evaluation of transportation impacts under the California Environmental Quality Act (CEQA). SB 743 removes the use of automobile delay or traffic congestion for determining transportation impacts in environmental review. Instead, the latest *CEQA Statute & Guidelines* now specify that Vehicle Miles Traveled, or VMT[3], is the appropriate metric to evaluate transportation impacts. To comply with these new rules, each lead agency will need to define policies and practices regarding the evaluation of transportation impacts under the California Environmental Quality Act, including guidance on how VMT should be calculated and presented in environmental documents. In short, SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts *to drivers*, to measuring the impact *of driving*.

Approach

Under CEQA, agencies must decide what constitutes a significant environmental impact. The *CEQA Statute & Guidelines* encourage local agencies to adopt thresholds of significance. The thresholds for VMT can be quantitative (i.e., a measured value such as the concentration of greenhouse gas emissions in the atmosphere) or qualitative performance standard (i.e., VMT on local streets) by which the agency can measure the relative magnitude of an impact caused by a project causes determine if the project's impacts are significant). In fact, the new *CEQA Statute & Guidelines* Section 15064.3(b)(4) (cited below) establishes that the lead agency has discretion to choose the most appropriate VMT methods for transportation impact analysis.

> *Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.*

[3] VMT refers to "Vehicle Miles Traveled," a metric that accounts for the number of vehicle trips generated as well as the length or distance of those trips. VMT is an accessibility performance metric that evaluates the changes in land use patterns, regional transportation systems, and other built environment characteristics, which is different from what the mobility performance metric vehicle level of service measures – vehicle mobility. The white paper will use the terms project generated VMT and project's effect on VMT using boundary VMT metrics for specific geographic areas. Project generated VMT is the sum of the "VMT from" and "VMT to," and within a project site. Project's effect on VMT uses geographic boundary VMT to evaluate the change in VMT on all roadways without and with the project within a specific geographic area.

The expectations for environmental impact analysis highlighted within the *CEQA Statute & Guidelines* are listed below.

- § 15003 (f) = fullest possible protection of the environment…
- § 15003 (i) = adequacy, completeness, and good-faith effort at full disclosure…
- § 15125 (c) = EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated…
- § 15144 = an agency must use its best efforts to find out and disclose…
- § 15151 = sufficient analysis to allow a decision which intelligently takes account of environmental consequences…

With the *CEQA Statute & Guidelines* expectations for an environmental impact analysis in mind, this white paper discusses the following seven questions, grouped into four categories involving VMT metrics, VMT calculation methods, VMT significance thresholds, and VMT mitigation actions.[4]

1. **VMT Metrics**: What form of VMT metrics could be used?
2. **VMT Calculation Methods**: What methods are available to use in estimating and forecasting VMT?
3. **VMT Impact Significance Thresholds**: Is the use of VMT impact screening desired? What is the VMT impact significance threshold for land use projects and land use plans under baseline conditions? What is the VMT impact significance threshold for land use projects and land use plans under cumulative conditions? What is the VMT impact significance threshold for transportation projects under baseline and cumulative conditions?
4. **VMT Mitigation Actions**: What VMT reduction mitigation strategies are feasible?

We highlight options and limitations for each question from a technical transportation planning and engineering perspective with a particular emphasis on addressing the *CEQA Statute & Guidelines* expectations for an environmental impact analysis.

For simplicity, a Decisions, Options, Considerations, and Recommendations matrix accompanies this white paper as **Appendix A** and summarizes policy approaches to the questions listed above. City of Cupertino staff will use the white paper and other supporting materials to develop VMT significance thresholds.

Because VMT is also used as an input for air quality, greenhouse gases, and energy consumption impact analyses in CEQA, the white paper will also discuss how VMT significance thresholds affect other aspects of the CEQA process.

For each of the seven questions, there are three separate categories of projects that are subject to CEQA review and for which VMT evaluation will be needed. The City will need to address how each of these

[4] Typical CEQA practice focuses on environmental effects that occur on a typical weekday, so all references to VMT in this white paper are intended to mean VMT that occurs on a typical weekday.

three project categories will be evaluated, and consider all three project types when responding to policy questions:

- **Land Use Projects**: typically development projects on a single parcel or multiple adjacent parcels
- **Land Use Plans**: such as a General Plan update and future Specific Plans
- **Transportation Projects**: infrastructure changes such as building or removing roads, bicycle facilities, and transit facilities

The implementation of SB 743 is just beginning for many lead agencies. Current CEQA practices have developed over several decades, incorporating a large body of case law and periodic updates to the *CEQA Statute & Guidelines*. Because SB 743 implementation is brand new, there is not yet any case law to guide our understanding or interpretation. The white paper represents our current understanding of the options, limitations, and considerations, informed by our research into SB 743 and knowledge of past CEQA practice; this understanding will evolve over time as more agencies apply SB 743 concepts to their own CEQA procedures.

Outline

This report includes a background discussion about SB 743 and then transitions to discussion of the four topics areas listed above, as well as providing information on multimodal performance measure options and additional implementation considerations. The white paper is outlined below.

- **Chapter 2: Background**. A background discussion of transportation analysis before and after SB 743 implementation to provide context for the decisions in the following sections. This section will also include a summary of relevant local land use and transportation polices planning documents, including the *Cupertino General Plan – Community Vision 2015-2040* (2015), specification of the Santa Clara County Valley Transportation Authority (VTA) VMT Web Tool, the City's standard conditions of approval, the VTA *Transportation Impact Analysis Guidelines* (2014), *City of Cupertino Transportation Impact Fee (TIF) Nexus Study* (2017), *City of Cupertino 2016 Bicycle Transportation Plan* (2016), *City of Cupertino Pedestrian Transportation Plan* (2018), and *City of Cupertino Climate Action Plan* (2015).
- **Chapter 3: VMT Metrics**. As a lead agency, the City of Cupertino has the discretion to choose the most appropriate methods to evaluate a project's VMT, including how the results of that method are expressed. Generally, VMT is expressed in several ways: total project generated VMT, project generated rates (total project generated VMT per service population[5] or partial project generated VMT per resident/per employee), in total (all VMT associated with a project or plan), or as the net "effect" a project will have on VMT (listed as project's effect on VMT). This section will describe the benefits and shortcomings of each metric.

[5] "Service population" includes all of the variables that generate vehicle trips in the models that estimate VMT; in most instances this will be the total number of residents plus the number of employees in the analysis area or project; however, it may also include other categories of people, such as visitors or students, if those categories are used in the trip generation estimates in the travel forecast model.

- Question 1: What form of VMT metrics could be used?[6]
  - Total project generated VMT
  - Project generated VMT rates
    - Total project generated VMT per service population
    - Partial project generated VMT per resident (or per employee)
  - Project's effect on VMT (within a selected geographic boundary)

- **Chapter 4: VMT Calculation Methods**. VMT forecasts are generated using various forms of models that range from simple spreadsheets (off-model) based on historic traffic growth trends to complex computer models that account for numerous factors that influence travel demand. In some cases, VMT can be estimated using sketch models or spreadsheet tools. VMT can also be estimated directly by multiplying the number of trips by an average trip length. Given the availability of two travel forecasting modes, the white paper will provide each agency with a review of Metropolitan Transportation Commission (MTC) and the Santa Clara County Valley Transportation Authority (VTA) travel forecasting models for VMT calculations in Santa Clara County, including analytical strengths and weaknesses of each option.
  - Question 2: What methods are available to use in estimating and forecasting VMT?
    - Select a non-model "accounting method" or a travel forecasting model for estimating and forecasting VMT at a regional, county, and/or local geographic area.

- **Chapter 5: VMT Impact Significance Thresholds**. Each lead agency has discretion to choose its threshold of significance for identifying a VMT impact. The intent of a VMT threshold is to identify whether a project has substantial environmental impacts due to traffic (such as noise, air, pollution, and safety concerns), and whether a project balances the needs of congestion management with statewide goals, such as the promotion of infill development. This chapter will also discuss the opportunity for "screening" projects in low VMT or transit priority areas. This chapter will describe possible thresholds and summarize the supporting evidence for each.
  - Question 3: Is the use of VMT impact screening desired?
    - Projects located near frequent and high capacity transit
    - Projects located in low-VMT generating area
    - Local-serving retail projects
    - Specific transportation projects
    - Projects with no net VMT increase
    - Small projects

[6] Each VMT metric will be defined in the white paper.

- Question 4: What is the VMT impact significance threshold for land use projects and land use plans under baseline conditions?
    - Set a threshold consistent with state goals for air quality, greenhouse gas, and energy conservation.
    - Set a threshold consistent with the General Plan.
- Question 5: What is the VMT impact significance threshold for land use projects and land use plans under cumulative conditions?
    - Fair share of regional VMT allocation
    - Cumulative VMT thresholds similar to baseline VMT thresholds
    - Long-term air quality and greenhouse gas expectations
- Question 6: What is the VMT impact significance threshold for transportation projects under baseline and cumulative conditions?
    - Consider transportation project screening criteria and Caltrans' pending VMT threshold.

- **Chapter 6: VMT Mitigation Actions**. The City will also need to determine if projects will be able to mitigate significant VMT impacts, and whether those measures can reduce the severity of a potential VMT impact. This chapter will include a review of how other jurisdictions have incorporated transportation demand management into their VMT mitigation measures for VMT impacts, and a discussion of the potential risks and uncertainties related to VMT mitigation measures. This white paper will also discuss program-based VMT mitigation approaches which may be more effective than project-site only strategies and provide a way for development contributions to be pooled to pay for VMT reduction strategies that would not be feasible for individual projects to implement.
    - Question 7: What VMT reduction mitigation strategies are feasible?
        - Possible options include a VMT cap, VMT fee, VMT bank, and VMT exchange.
- **Chapter 7: Multimodal Performance Measures**. A transportation analysis evaluates all modes of travel to determine deficiencies and improvements. A subset of these deficiencies is used to determine significant impacts and mitigation as a part of the environmental analysis process. Using the existing City policies on transportation as a guide, a set of non-environmental analysis performance measures for the network, corridor, and site-specific levels are presented for the City to considering incorporating into its transportation analysis approach. This chapter ends with some suggested next steps for adopting a multimodal performance measure.
- **Chapter 8: Additional Implementation Considerations**. This final chapter discusses a few City-specific implementation considerations.

Chapter 2. Background

Use of CEQA Prior to SB 743

CEQA was enacted in 1970 with the goal of providing a mechanism for disclosing to the public the environmental impacts of proposed actions. Before taking a discretionary action, lead agencies (such as the City of Cupertino) must determine if that action is subject to CEQA and conduct a review of the effects of that action on the physical environment. The State Office of Planning and Research (OPR) prepares and maintains guidelines to help agencies implement CEQA.

Under CEQA, lead agencies must determine whether a proposed project has the potential to cause significant environmental impacts. This determination must be based, to the extent possible, on factual data and scientific methods of analysis. The project's effect on transportation is one of the areas that must be analyzed. For many years, the City of Cupertino has used vehicle Level of Service (LOS) as the primary measure to evaluate a project's effect and determine transportation impacts.

LOS is a qualitative description of vehicular traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which reflects free-flow conditions where there is very little interaction between vehicles, to LOS F, where vehicle demand exceeds capacity and high levels of vehicle delay result. LOS E represents "at-capacity" operations. When traffic volumes exceed the capacity at an intersection, vehicles may wait through multiple signal cycles before traveling through the intersection; these operations are designated as LOS F. The calculation of vehicle LOS is done through the application of specialized software and is based on traffic counts, observations of vehicle interactions, and data about traffic signal operations (at those intersections that are signalized).

Mitigating a LOS impact typically involves making changes to the physical transportation system in order to accommodate additional vehicles and reduce delays. These mitigations may involve actions such as installing traffic signals, adding turn lanes, widening roads, or contributing to the construction of HOV/Express Lanes, among other options. The identification of necessary mitigations resulting from project impacts has historically led to project sponsors identifying and funding these changes to the transportation system (i.e., paying a "fair share" contribution toward funding a new traffic signal or widening an existing roadway).

Overview of Senate Bill 743 and Legal Framework

On September 27, 2013, Governor Jerry Brown signed SB 743 into law and started a process intended to fundamentally change transportation impact analysis as part of CEQA compliance. Specifically, the legislation directed the State of California's OPR to look at different metrics for identifying transportation impacts and make corresponding revisions to the *CEQA Statute & Guidelines*. The initial bill includes two legislative intent statements (emphasis and bullets added):

- **New methodologies** under the California Environmental Quality Act are **needed for evaluating transportation impacts** that are better able to promote the state's goals of reducing greenhouse gas emissions and traffic-related air pollution, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations.
- More appropriately balance the needs of congestion management with statewide goals related to **infill development**, promotion of public health through **active transportation**, and **reduction of greenhouse gas emissions**.

These statements are important because they provide direction to OPR and to lead agencies. For OPR, the direction is largely about what the new metrics should achieve. For lead agencies, the direction is about expected changes in transportation analysis (and related technical areas) and what factors to consider for significance thresholds.

To implement this intent, SB 743 contains amendments to current congestion management law that allow cities and counties to opt out of the LOS standards that would otherwise apply. SB 743 does not prevent a lead agency from continuing to analyze delay or LOS as part of other plans (e.g., the general plan), fee programs, or ongoing network monitoring. However, automobile delay as described by LOS is no considered a significant impact on the environment for purposes of CEQA. Lead agencies may still consider vehicle LOS outside of the CEQA process if they determine it is an important part of their transportation planning process. The most common applications will likely occur for jurisdictions wanting to use vehicle LOS to plan roadways in their General Plans or determine nexus relationships for their impact fee programs. Jurisdictions can also continue to condition projects to build transportation improvements through the entitlement process in a variety of ways.

Following several years of draft proposals and related public comments, OPR settled upon VMT as the preferred metric for assessing passenger vehicle-related impacts and issued revised *CEQA Statute & Guidelines* in December 2018, along with a *Technical Advisory On Evaluating Transportation Impacts in CEQA* (December 2018) to assist practitioners in implementing the *CEQA Statute & Guidelines* revisions. Under the revised *CEQA Statute & Guidelines*, vehicle level of service (LOS) is no longer to be used as a determinant of significant environmental impacts, and analysis of a project's impacts will now be based on assessment of VMT. As of July 1, 2020, all transportation analysis performed under CEQA must be consistent with the revised *CEQA Statute & Guidelines*.

The OPR *Technical Advisory* guidance is not a recipe for SB 743 implementation. Lead agencies must still make their own specific decisions about metrics, methods, thresholds, and mitigation. Further, the OPR guidance is primarily tied to statewide goals for greenhouse gas (GHG) reduction, and does not attempt to balance or resolve potential conflicts between state and lead agency goals, such as those expressed in local agency general plans and/or climate action plans.

The *CEQA Statute & Guidelines* and the associated OPR *Technical Advisory* are largely consistent with the legislative direction noted above. Specifically, the use of VMT as a metric focuses on the total *amount* of driving, rather than the driving *experience*. This new view presents an impact filter intended to promote

the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. VMT can help identify how projects (land development and infrastructure) influence accessibility (i.e., access to places and people), noise, and emissions; thus, its selection as a metric is aligned with the objectives of SB 743.

While final implementation steps for SB 743 have not yet been completed by most lead agencies, enough information is available to inform lead agencies about how to prepare for the upcoming transition to VMT. Based on the background context outlined above, the remainder of this document provides information about key decisions the City will need to make regarding VMT metrics, calculation methods, impact thresholds, and impact mitigation.

State of SB 743 Implementation

As **Appendix B** summarizes, the California lead agencies that adopted VMT thresholds by Spring 2020 and have had experience reviewing CEQA projects using those thresholds are as follows:

- City/County of San Francisco
- City of Oakland
- City of Elk Grove
- City of Los Angeles
- City of Palo Alto
- City of San Jose
- City of Woodland
- CSU System: All 23 Campuses
- San Bernardino County

Most early adopters were larger jurisdictions such as the City/County of San Francisco, City of Oakland, City of Los Angeles, and City of San Jose. These jurisdictions implemented screening thresholds by partial VMT or total VMT. Of these jurisdictions, only the City/County of San Francisco chose not to maintain LOS as an analysis requirement. Some of the more suburban communities have chosen to set thresholds based on total VMT. Also included in **Appendix B** is a sample of VMT threshold options currently under consideration, or recently adopted in Summer 2020, by Santa Barbara County, City of South San Francisco, City of San Bruno, and Nevada County. As will be discussed in the following chapters, there are many possible VMT thresholds, but two prevailing threshold options are most prevalent: 1) a project-by-project baseline conditions VMT screening by land use (similar to or identical to the OPR Technical Advisory), or 2) set a jurisdiction-specific VMT threshold based on long-term expectations for air quality and greenhouse gas expectations (as discussed later, a jurisdiction may choose to complete VMT impact analysis as part of its General Plan EIR and make specific use of *CEQA Statute & Guidelines* Section 15183 to streamline project specific CEQA analysis).

Local Framework and Summary of Existing Policies

The General Plan includes underlying expectations of how population and employment will change between the base year and future year scenarios. Because VMT is a composite metric that is an output of combining long-term population and employment growth projections with long-term transportation network infrastructure, the City of Cupertino effectively already has a VMT growth "budget" that has already been planned for and determined to be acceptable in the *Cupertino General Plan – Community Vision 2015-2040* (2015) and *City of Cupertino Climate Action Plan* (2015). The General Plan and Climate Action Plan include goals, policies and strategies to reduce VMT by encouraging mixed-use development along key corridors and gateways and a multimodal transportation system. The *City of Cupertino 2016 Bicycle Transportation Plan* (2016), and the *City of Cupertino Pedestrian Transportation Plan* (2018) describe the planned bicycle and pedestrian networks, respectively. The *City of Cupertino Transportation Impact Fee (TIF) Nexus Study* (2017) is an implementation program that allows the City to collect a one-time fee from new developments to cover the cost of vehicle and bicycle capital improvements determined to be necessary to support the land use growth in the City. Key goals and visions of these documents are discussed below; the City Council will consider this policy guidance as it sets its VMT thresholds.

This section will also include a discussion of the specification of the Santa Clara Countywide VMT Estimation Tool that will screen and estimate project generated VMT and VMT reductions for land use projects in Santa Clara County, the City's standard conditions of approval, and the VTA *Transportation Impact Analysis Guidelines* (2014).

General Plan

The Land Use and Community Design Element, and Mobility Element of the *Cupertino General Plan – Community Vision 2015-2040* (2015) states the community's land use and transportation goals, policies, and strategies for land use growth and multimodal travel. The General Plan emphasizes land use growth along major mixed-use corridors and mixed-use nodes, and an enhancement of the connectivity and quality of the multimodal transportation system to support economic vitality, air quality and greenhouse goals, and urban design amenities. The Mobility Element goals are listed below for reference:

- Goal M-1: Actively participate in regional planning processes to coordinate local planning and to advocate for decisions that meet and complement the needs of Cupertino.
- Goal M-2: Promote improvements to city streets that safely accommodate all transportation modes and persons of all abilities.
- Goal M-3: Support a safe pedestrian and bicycle street network for people of all ages and abilities.
- Goal M-4: Promote local and regional transit that is efficient, frequent, convenient, and reduces traffic impacts.
- Goal M-5: Ensure safe and efficient pedestrian and bicycle access to schools while working to reduce school-related congestion.
- Goal M-6: Promote innovative strategies to provide efficient and adequate vehicle parking.

- Goal M-7: Review and update TIA policies and guidelines that allow for adequate consideration for all modes of transportation, including automobiles, walking, bicycles, and transit.
- Goal M-8: Promote policies to help achieve state, regional, and local air quality and greenhouse gas emission reduction targets.
- Goal M-9: Promote effective and efficient use of the city's transportation network and services.
- Goal M-10: Ensure that the city's transportation infrastructure is well-maintained for all modes of transportation and that projects are prioritized on their ability to meet the City's mobility goals.

The General Plan policies and strategies provide additional detail regarding the underlying expectations of how population and employment will be supported and how the community will travel. Additionally, the General Plan describes modal priorities in its street typology and circulation network figure by indicating which modes individual streets and street types will be designed for. While Policy M-1.2[7] states the City's vehicle level of service policy, General Plan Goal M-7 indicates that the City will review and update its Transportation Impact Analysis (TIA) policies and guidelines with Policies M-7.1[8] and M-7.2,[9] highlighting possible approaches to updating its level of service policy (see **Chapter 7** for more details about possible multimodal methods).

Climate Action Plan

Over the past 10 years, the State of California has adopted legislation to address climate change and streamline CEQA evaluation (including AB 32, SB 375, SB 743, and AB 1358). Specifically, with the passage of Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, the State of California committed itself to reducing GHG emissions to 1990 levels by 2020. SB 375 provides guidance on how curbing emissions from cars and light trucks can help the state comply with AB 32. In response to this State legislation and its community values to reduce greenhouse gas emissions, Cupertino prepared the *City of Cupertino Climate Action Plan* (2015). The Climate Action Plan quantifies and estimates community-wide and municipal GHG emissions between 2010 and 2050 with specific measures to reduce GHG emissions.

[7] Policy M-1.2: Transportation Impact Analysis: Participate in the development of new multi-modal analysis methods and impact thresholds as required by Senate Bill 743. However, until such impact thresholds are developed, continue to optimize mobility for all modes of transportation while striving to maintain the following intersection Levels of Service (LOS) at a.m. and p.m. peak traffic hours:

- Major intersections: LOS D
- Stevens Creek Boulevard and De Anza Boulevard: LOS E+
- Stevens Creek Boulevard and Stelling Road: LOS E+
- De Anza Boulevard and Bollinger Road: LOS E+

[8] Policy M-7.1: Multi-Modal Transportation Impact Analysis: Follow guidelines set by the VTA related to transportation impact analyses, while conforming to State goals for multi-modal performance targets.

[9] Policy M-7.2: Protected Intersections: Consider adopting a Protected Intersection policy, which would identify intersections where improvements would not be considered, which would degrade levels of service for non-vehicular modes of transportation. Potential locations include intersections in Priority Development Areas (PDAs) and other areas where non-vehicular transportation is a key consideration, such as, near shopping districts, schools, parks and senior citizen developments.

The transportation sector represents the second largest community-wide GHG emissions sector (34%). The transportation measures include the following:

- Measure C-T-1 Bicycle & Pedestrian Environment Enhancements – Continue to encourage multi-modal transportation, including walking and biking, through safety and comfort enhancements in the bicycle and pedestrian environment.
- Measure C-T-2 Bikeshare Program – Explore feasibility of developing local bikeshare program.
- Measure C-T-3 Transportation Demand Management – Provide informational resources to local business subject to SB 1339 transportation demand management program requirements and encourage additional voluntary participation in the program.
- Measure C-T-4 Transit Route Expansion – Explore options to develop local community shuttle or community-wide car sharing to fill gaps in existing transit network.
- Measure C-T-5 Transit Priority – Improve transit service reliability and speed.
- Measure C-T-6 Transit-Oriented Development – Continue to encourage development that takes advantage of its location near local transit options (e.g., major bus stops) through higher densities and intensities to increase ridership potential.
- Measure C-T-7 Community-Wide Alternative Fuel Vehicles – Encourage community-wide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.

The CAP assumes that 85% of the estimated reduction in the transportation sector GHG emissions will come from low carbon fuels and increased vehicle efficiency, while Transportation Demand Management will account for the remaining 15 percent (the reduction associated with other measures was not modeled because they were considered to be supportive measures to the built environment characteristics and TDM in Cupertino).

Bicycle Plan

The *City of Cupertino 2016 Bicycle Transportation Plan* (June 2016) summarizes goals for improving the bicycle network, existing and proposed facilities, and programs involving education, enforcement, and promotion. The Bicycle Plan was developed in conformance with several other plans including the *Cupertino General Plan*, the *Santa Clara Valley Transportation Authority Countywide Bicycle Plan*, the *Metropolitan Transportation Commission Regional Bicycle Plan*, the *Santa Clara County Trails Master Plan*, and the *Caltrans Streets and Highways Code Section 891.2*. Goals of the Bicycle Plan are as follows:

- Goal 1 - Programs: Increase awareness and value of bicycling through encouragement, education, enforcement, and evaluation programs.
- Goal 2 - Safety: Improve bicyclist safety through the design and maintenance of roadway improvements.
- Goal 3 - Mobility: Increase and improve bicycle access to community destinations across the City of Cupertino for all ages and abilities.

Pedestrian Plan

The *City of Cupertino Pedestrian Transportation Plan* (February 2018) summarizes goals for the pedestrian network, existing and proposed facilities, and priority of pedestrian improvements. The Pedestrian Plan was developed in conformance with the *Cupertino General Plan* and other City guidance documents. Goals of the Pedestrian Plan are as follows:

- Goal 1 - Safety: Improve pedestrian safety and reduce the number and severity of pedestrian-related collisions, injuries, and fatalities.
- Goal 2 - Access: Increase and improve pedestrian access to community destinations across the City of Cupertino for people of all ages and abilities.
- Goal 3 - Connectivity: Continue to develop a connected pedestrian network that fosters an enjoyable walking experience.

Transportation Impact Fee

The *City of Cupertino Transportation Impact Fee (TIF) Nexus Study* (2017) is an implementation program that allows the City to collect a one-time fee from new developments to cover the cost of vehicle and bicycle capital improvements determined to be necessary to support the land use growth in the City. A "nexus study" is used to establish the nexus (or relationship) between new development that occurs in a jurisdiction and the need for new and expanded transportation facilities. After establishing the nexus, the study calculates the development impact fees to be levied for each land use type in the areas of benefit, based on the proportionate share of the total facility use for each type of development. A nexus study identifies the maximum allowable fee, but does not determine a particular fee level; the relevant policy-making body (in this case, the City Council) has the authority to decide specifically what fees will be charged within the framework provided by the nexus study.

In general, the relevant state legislation governing fee programs (the Mitigation Fee Act, California Government Code sections *66000 et seq.*) require that a nexus study address the following topics:

- Identify the purpose of the fee.
- Identify how the fee is to be used.
- Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed.
- Determine how a reasonable relationship exists between the need for the public facility and the type of development project on which the fee is imposed.
- Demonstrate a reasonable relationship between the amount of the fee and the cost of the public facility, or portion of the public facility, attributable to the development on which the fee is imposed.

The City's transportation fee project list includes a combination of freeway interchange, street, and intersection improvements focused on localized vehicle operations and bicycle improvements focused on improving the connectivity and quality of the bicycle network.

Santa Clara Countywide VMT Estimation Tool

The Santa Clara Countywide VMT Estimation Tool (SCC VMT Estimation Tool) will screen projects that are exempt from further VMT analysis using project generated VMT thresholds and transportation priority areas, estimate the project generated VMT rate, and estimate VMT reductions for land use projects in Santa Clara County. The types of land use projects addressed include residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without local serving retail space. The SCC VMT Estimation Tool is modular such that VTA, along with cities in Santa Clara County and the County of Santa Clara, can include specific VMT screening criteria or model data within the Tool. The Tool is scalable such that it can be used for a range of project sizes and location within any jurisdiction in Santa Clara County.

The SCC VMT Estimation tool evaluates the VMT for proposed land use projects by determining whether the project is located within a low VMT generating area, estimating the project generated VMT, and evaluating the project generated VMT after potential reduction measures have been applied. The travel forecasting data that the SCC VMT Estimation Tool uses is static, meaning that any data in this tool does not affect the data used from the source travel forecasting model.

The SCC VMT Estimation Tool consists of three separate modules:

- **VMT Screening** – The location of the project is used to determine if the project site is within a low VMT generating area, including low VMT generating traffic analysis zones (TAZ) or parcels and transit priority areas (TPA).
- **Project Generated VMT** – A combination of the project's location and project details is used to estimate VMT generated from the project, which is expressed as a VMT rate (i.e., VMT per population generating the VMT). This process can use the Santa Clara Valley Transportation Authority (VTA)'s parcel-level VMT data or TAZ level VMT generation rates to estimate the project's VMT.
- **VMT Reductions** – A series of VMT mitigation measures are applied to potentially reduce the project generated VMT. The project VMT is compared to the applicable VMT threshold to determine whether it falls below the threshold at the start, or whether it is reduced below the threshold after applying additional VMT reduction measures. The VMT threshold used in this module is calculated in the VMT Screening module.

City's Standard Conditions of Approval

For each development permit review, the City will often develop conditions of approval to establish requirements placed on a permit or development. The City's Standard Conditions of Approval template includes a condition for bicycle parking, while other transportation related conditions are often added in a separate resolution or development agreement. Additional requirements may include pedestrian, bicycle, or transit improvements on site or nearby, payment of transportation fees, funding of off-site vehicle transportation improvements identified in a transportation impact analysis beyond the improvements included in the transportation fee program, and other public benefits.

VTA Transportation Impact Analysis Guidelines

As stated in Policy M-7.1, Cupertino follows the *Santa Clara Valley Transportation Authority (VTA) Congestion Management Program Transportation Impact Analysis Guidelines* (2014) when conducting a transportation impact analysis for a land use or transportation project that affects congestion management program intersections or freeway segments. For consistency, City staff has also used these guidelines for local intersection analysis to evaluate the effects on the CMP facilities, General Plan consistency, and environmental impact analysis. Prior to the change in the *CEQA Statute & Guidelines* to use VMT to disclose potential transportation impacts on the human health or natural environment, the VTA Guidelines were used by the City to provide a clear and consistent technical approach for projects that could have transportation effects (adverse and beneficial) on the transportation system and services, and the resulting reports provide essential information for decision-makers and the public when evaluating individual development and transportation infrastructure projects.[10]

[10] Once the City Council has made its decisions regarding the VMT Metrics, VMT Methods, VMT Thresholds, and VMT Mitigation Approach, City of Cupertino Transportation Analysis (TA) guidelines will be prepared to provide a clear and consistent technical approach to transportation improvement and operations analysis within the City of Cupertino.

Chapter 3. VMT Metrics

The *CEQA Statute & Guidelines* state that each lead agency can identify the metrics and methods used to evaluate environmental effects, so the City of Cupertino can choose from a variety of VMT metrics. Typical CEQA practice focuses on environmental effects that occur on a typical weekday, so all references to VMT in the remainder of this white paper are intended to mean VMT that occurs on a typical weekday. Weekday VMT can be broken down into components related to trips for specific purposes (for example, commute trips or shopping trips). Total VMT will tend to scale with the level of activity in a location; that is, the more people who live or work in a particular zone, the higher the total VMT associated with that zone.

Many jurisdictions find it useful to express VMT as an efficiency metric (e.g., VMT per person or VMT per employee). This form of the metric is unrelated to the level of activity in a particular location and more about how efficiently the people at that location travel. A project that contributes to a more efficient use of the transportation system would reduce the total VMT per person as compared to a no-project scenario. A commonly used efficiency metric is "total VMT per service population," in which the denominator called "service population" includes all the variables that generate vehicle trips in the models that estimate VMT; in most instances this will be the total number of residents plus the number of employees in the analysis area or project; however, it may also include other categories of people, such as visitors or students, if those categories are used in the trip generation estimates in the model.

Recommendations in OPR Technical Advisory

The OPR *Technical Advisory* recommends the use of efficiency metrics for presentation in CEQA analysis, particularly the following:

- **Residential Land Use:** Home-based (light-duty vehicle) VMT per capita, or household generated VMT per capita.
- **Office Land Use:** Home-based work (light-duty vehicle) VMT per employee, work tour VMT per employee, or total employee VMT per employee.[11]

OPR recommends a total VMT metric for retail uses, particularly the following:

- **Retail Land Use:** Total VMT (all vehicles) within an area affected by a project.

[11] The primary difference between these options is how many employee trips are included in the VMT metric. Home-based work VMT includes only vehicle trips directly between work and home or home and work. A work tour includes all chain trips from work to home to work including intermediate trips such as traveling from home, to a child's school, to work. Total employee VMT would include all work tour VMT, as well as any additional trips by vehicle (e.g., to travel off-site for lunch and back) made by the employee. Different travel forecasting models may present one or more of these metrics based on their structure and functionality.

As the OPR examples show, the VMT metric specification can include all or a portion of all trip purposes, populations, and vehicle types. The OPR recommendations illustrate two VMT metric option concepts:

1. Total VMT (used in the OPR metric for the retail land use), as compared to partial VMT (used in the OPR metrics for office and residential land uses).
2. Project Generated VMT (used in the OPR metrics for office and residential land uses), as compared to project's effect on VMT (used in the OPR metric for the retail land use).

What Form of VMT Metrics Could be Used?

VMT can be expressed in a variety of forms, depending on specific objectives of the analysis. Examples of these forms include:[12]

- **Total Project Generated VMT:** VMT including all vehicle trips, vehicle types, and trip purposes. This can be expressed as total project generated VMT or total project generated VMT per service population (residents plus employees and other populations like students and visitors that generate the total project generated VMT).[13]
- **Partial Home-Based VMT:** VMT generated by light-duty vehicles for all trips that begin or end at a residential land use. This is used in describing the VMT effects of residential land uses and is often expressed as home-based VMT per capita.
- **Partial Home-Based Work VMT:** VMT generated by light-duty vehicles only for commute trips (that is, trips that have one end at a workplace and one end at a residence). This is used in describing the VMT effects of workplaces, and is often expressed as home-based work VMT per employee.
- **Total Boundary VMT:** VMT that occurs within a selected geographic boundary (e.g., city, county or region) by any type of vehicle. This captures all on-road travel occurring on a roadway network for any purpose, and includes local trips as well as trips that pass through the area without stopping.

[12] The definitions in this whitepaper describe VMT metrics that can be extracted from a trip-based travel forecasting model such as the VTA travel forecasting model. A tour-based travel forecasting model like the Metropolitan Transportation Commission's (MTC) model estimates different VMT metrics (e.g., household generated VMT per capita, total VMT per employee, or work tour VMT per employee).

[13] While service population most typically includes residents and employees, it may also include any other variables used to estimate trip generation: for instance, at a school site, the service population may include both employees and students. The precise definition of the service population will vary based on model specifications and land use.

VMT Metric Options: Total VMT and Partial VMT

Total VMT metrics include all types of VMT captured by a travel forecasting model, regardless of the type of vehicle or the trip's purpose. In practice, this means the metric includes visitor trips, medium-duty and heavy-duty vehicles, public transit buses, and other types of vehicle miles that might not be captured in the most common partial VMT metrics.

To the extent that SB 743 is designed to promote infill development, and there is substantial evidence that building projects proposed in a particular area will have similar VMT effects to Existing Conditions in that area, a total VMT analysis may not be necessary, or total VMT may be estimated using simpler approaches than a unique travel demand forecasting model run (methodology options are discussed in Chapter 4). However, for projects that are likely to change project generated VMT rates because of its size, complex project attributes that effect vehicle travel, or because they would be a unique or new land use for the study area, a total VMT metric will likely be the most appropriate way to assess project effects. In addition, total VMT metrics derived from a transportation forecasting model are necessary to measure a project's *effect* on VMT, or how the project changes the total VMT in a given geographic area. This Total Boundary VMT is discussed further in a later section, Project's Effect on VMT.

Total VMT is also useful for consistency with other EIR sections, namely greenhouse gases, air quality, and energy consumption. Each of these sections uses total VMT as an input for its analysis, although they may consider VMT on an annual rather than daily basis.

Partial VMT refers to the use of only particular trip purposes and/or vehicle types for assessing a project's impacts. The efficiency metrics recommended by OPR for use in analyzing office and residential projects are partial VMT metrics, because they include only light-duty passenger vehicles and only trips for a specific purpose or made by a specific population. The benefits of these partial VMT metrics include the following: they allow for sketch-level analysis using findings from a prior model run; they are easier to understand and visualize; and for single land uses that are similar to existing development patterns, they are likely reflective of the same impact patterns as would be present with analysis of total VMT. Understanding where built environment conditions lead to VMT-efficient residential and workplace activity is substantial evidence that could help support conclusions that adding similar land uses to those areas would create similar outcomes. This can be considered analogous to collecting vehicle counts at a nearby existing project and developing custom local rates. For projects that may be subject to further scrutiny, only reporting a portion of VMT from select trip purposes and limiting the VMT to light-duty vehicles could be considered an incomplete analysis of VMT.

Project applicants may also have concerns with the separation of land uses because it may produce VMT forecasts that dilute the benefits of their projects. For example, mixed-use projects help reduce VMT by shortening vehicle trip lengths or reducing vehicle trips because of the convenience of walking, bicycling, or using transit between project destinations. To quantify these effects with models used in current practice requires analyzing the project as a whole.

VMT Metric Options: Project Generated VMT and Project's Effect on VMT

There are several different VMT metrics that must be included in a complete VMT analysis. One of them, "project's effect on VMT," requires use of a travel forecasting model to evaluate potential areawide VMT changes caused by the project.

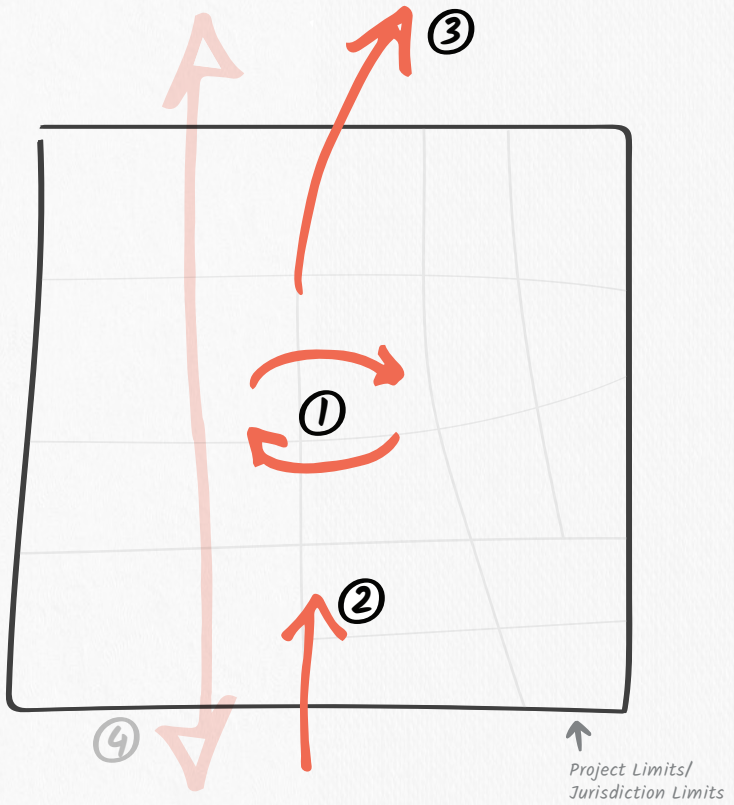
- **Project Generated VMT:** The sum of the VMT from, to, and within a project site.
- **Project's Effect on VMT (within a selected geographic boundary):** An evaluation of the change in total on-road vehicle travel within a geographic area boundary, between without and with project conditions. The boundary for a project's analysis should be selected based on project characteristics such as size and location. The analysis would typically be done at a citywide, countywide, or regional scale.[14]

The project generated VMT and project's effect on VMT (using boundary VMT) accounting methods are presented in **Figure 1** as a generic representation of the VMT metrics. **Figure 2** shows the same metrics based on the City of Cupertino city limits and street system. Both of these metrics are needed for a comprehensive view of a project's VMT effects. As discussed in the OPR *Technical Advisory*, ". . . new retail development redistributes shopping trips rather than creating new trips,"[15] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impact."

[14] An often-cited example of how a project can affect VMT is the addition of a grocery store in a food desert. Residents of a neighborhood without a grocery store have to travel a great distance to an existing grocery store. Adding the grocery store to that neighborhood will shorten many of the grocery shopping trips and reduce the VMT to/from the neighborhood.

[15] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles traveled: The case of the first big-box store in Davis, California,* The Journal of Transport and Land Use.

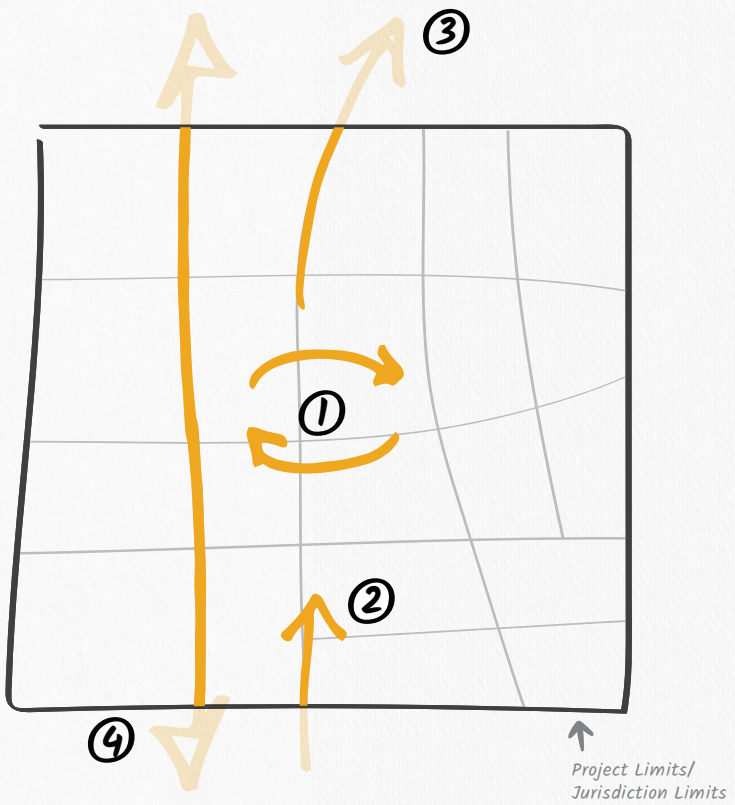
Project Generated VMT



① 2x Internal to Internal (2xII) VMT
② External to Internal (XI) VMT
③ Internal to External (IX) VMT
④ External to External (XX) VMT

Notes: External to External (XX) trips (shown as transparent arrow 4) are excluded from this VMT metric. Adjustments to project generated VMT made to include the full length of trips that leave the jurisdiction to capture inter-jurisdiction travel.

Project Effect on VMT
(Boundary VMT)

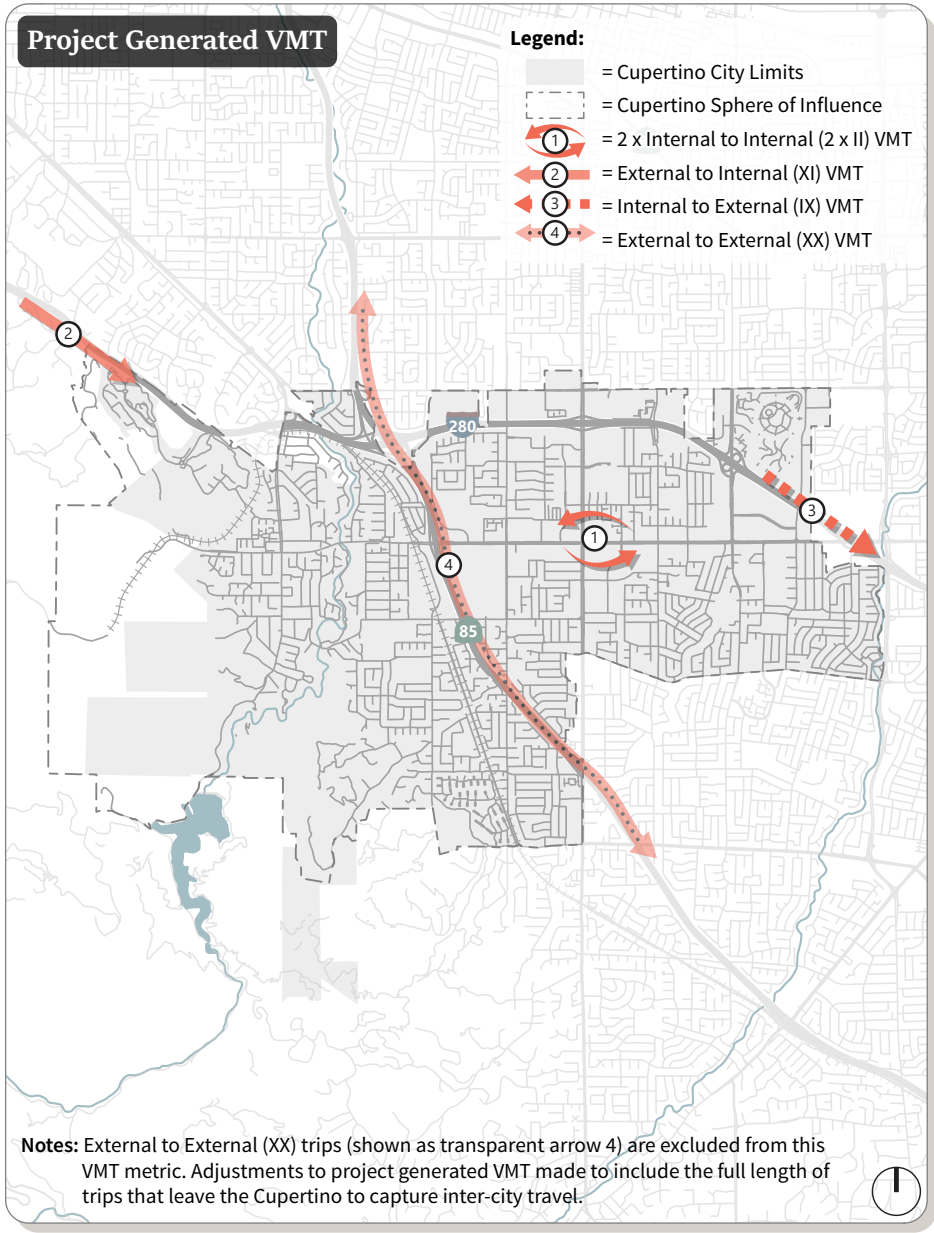


① Internal to Internal VMT
② External to Internal (XI) VMT
③ Internal to External (IX) VMT
④ External to External (XX) VMT

Notes: Boundary VMT is all the VMT on the streets within the Project Limits / Jurisdiction Limits. Transparent portions of arrows 2, 3 and 4 are not included in the VMT metric.

Figure 1

Measuring Vehicle Miles Traveled (VMT)



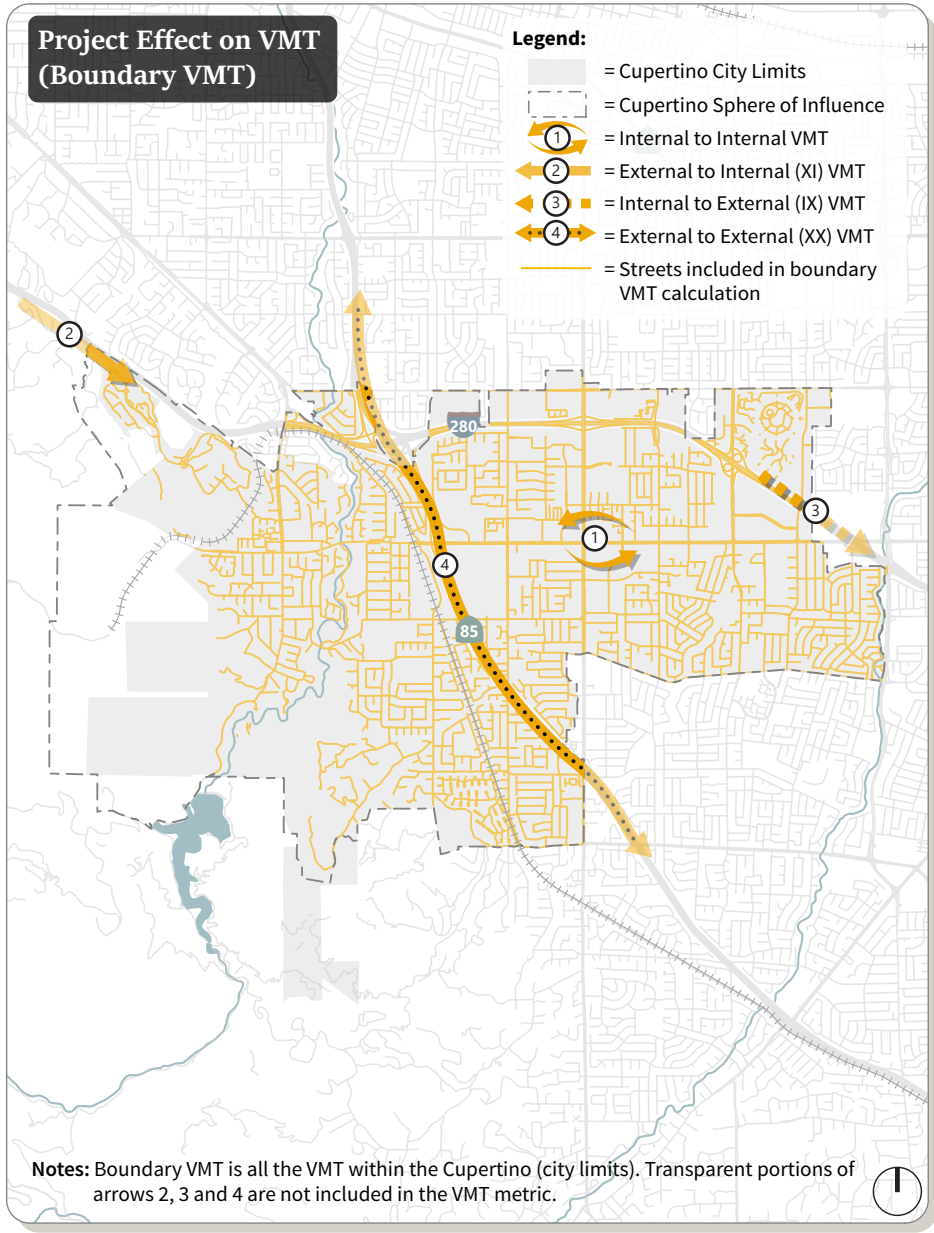


Figure 1

Measuring Vehicle Miles Traveled (VMT) in Cupertino with City Streets and City Limits

Project generated VMT is calculated by summing the "VMT from" and "VMT to" the project site (or a larger area when the project is a plan such as a Specific Plan or General Plan). These calculations are usually performed using outputs from a travel forecasting model. Most travel forecasting models will output information on the project generated VMT associated with the land use in a given transportation analysis zone (TAZ); that total is typically as follows:

$$Project\ Generated\ VMT = VMT\ From + VMT\ To = (II + IX) + (II + XI) = 2 * II + IX + XI$$

- **Internal-Internal (II):** The full length of all trips made entirely within the project area is counted.
- **Internal-External (IX):** The full length of all trips with an origin within the project area and destination outside of the area is counted.
- **External-Internal (XI):** The full length of all trips with an origin outside of the project area and destination within the area is counted.

There are two additional adjustments that should be made to reach a total project generated VMT. First, because most VMT calculation methods multiply the number of trip ends by the trip length, the internal-internal VMT in the project area is double counted; convention generally divides the internal-internal VMT by two to compensate for this. Second, an adjustment to the project generated VMT should be made to include the full length of trips that leave the travel forecasting model area to fully capture interregional travel (an example may be a trip from the Bay Area to Sacramento; Sacramento is not included in any of the Bay Area travel models). The total can be further broken down into components related to trips for specific purposes (for example, commute trips or shopping trips).

When describing VMT metrics in impact analysis, lead agencies should report project changes in absolute terms and consider whether an "efficiency form" of the metric, such as total project generated VMT per service population is meaningful for impact analysis. Since emissions and energy impact analysis require absolute amounts of VMT as an input, total weekday VMT in absolute terms is the minimum requirement. The efficiency form of the metric is a VMT generation rate similar to a vehicle trip rate. In addition, since total VMT will increase or fluctuate with population and employment growth, changes in economic activity, and expansion of new vehicle travel choices (i.e., Uber, Lyft, autonomous vehicles, etc.), expressing VMT measurement in an efficiency metric form allows for more direct comparisons to baseline conditions when it comes to land use projects, and land use plans.

Project's effect on VMT is estimated within a selected geographic boundary (e.g., city, county, or region) and captures all VMT on the roadway network, including both local trips and longer-distance travel that does not have an origin or destination within the area. It is often referred to as boundary VMT. It is a more complete evaluation of the potential effects of the project because it captures the combined effect of new VMT, shifting of existing VMT to/from other neighborhoods, and/or shifts in existing VMT to alternate travel routes or modes. The absolute change in VMT between a without project and with project condition can be compared directly if the land use totals are equal between scenarios. If the land use totals are different, the VMT should be divided by the service population (typically residents plus employees but

may include other VMT generators like students and visitors) to distinguish the effects of population and/or employment growth from the effects of changes in personal travel behavior.

The land use changes for small projects in the City of Cupertino are relatively small compared to the total residential population and employment of the city, and the typical project is unlikely to have widespread regional VMT effects. Therefore, if using a travel model to estimate a smaller project's effect on VMT, the selected geographic region should be either the city or a smaller study area. However, the selected area should remain large enough to capture the VMT changes associated with the project. Additional considerations for smaller projects are discussed further in the VMT Calculation Methods chapter (Chapter 4).

VMT Metrics for Other Resource Areas

As referenced earlier in this discussion of VMT metrics, a common practice for greenhouse gases, air quality, and energy consumption impact analysis is to use the following VMT, produced using a local or regional travel forecasting models:

- **Project generated VMT:** Total project generated VMT with adjustments for trips that travel outside the model area and disaggregated by speed bin.[16] (This VMT metric may vary based on a local jurisdictions General Plan, Climate Action Plan, and regional air district requirements.)
- **Project's effect on VMT within a select geography:** Boundary VMT on all roadways within a geographic area disaggregated by speed bin.

Emissions vary by speed bin; disaggregating VMT by speed bin allows different emissions factors to be applied at different speeds, which allows for the preparation of a more refined emissions analysis.

Summary of VMT Metric Options

The following summary table (**Table 1**) clarifies the VMT metric, definition, VMT accounting specification, and potential use as an input for other CEQA sections, including greenhouse gases, air quality, and energy consumption impact analysis. All VMT metrics listed in this table are described in the *Technical Advisory: On Evaluating Transportation Impacts in CEQA* (December 2018); see pages 5 and 6, and Appendix 1 of the *Technical Advisory*. It is suggested that each of these VMT metrics be included so that all forms of VMT needed for screening and complete analysis are available (including total VMT by speed bin for air quality, GHG, and energy impact analysis).

[16] Total boundary VMT by speed bin is the VMT on the roadway for a given speed range (typically a five-mile-an-hour increment of speed from 0 to ~80 miles per hour). Emissions rates of criteria pollutants and greenhouse gases, and energy consumption vary based on vehicle speed. Thus, segmenting VMT by speed bin provides a more precise estimate of these emissions.

Table 1: Summary of Common VMT Metrics

VMT Metric[1]	Definition	Location of VMT Accounting Specification in this Whitepaper	Recommended by OPR[2]	VMT used for other CEQA Sections?
Total Project Generated VMT	Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, presented as a total project generated VMT.	Project Generated VMT Accounting on page 18	Yes, for land use plans, and discussed in Appendix 1 of the OPR *Technical Advisory*.	Yes
Total VMT per Service Population[3, 4] (also "Total Project Generated VMT Rate")	Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, divided by the sum of residents plus employees in the analysis area generating the VMT.	Project Generated VMT Accounting on page 16 using Total VMT per Service Population.[4]	No, although may be helpful for mixed-use projects and comparing land use scenarios, particularly when using a travel forecasting model.	Yes
Home-Based VMT per Resident (a partial VMT estimate) (also "Home-Based VMT Rate")	VMT generated by light-duty vehicles (i.e., private cars and trucks) for all trips that begin or end at a residential land use, divided by residents.	Project Generated VMT Accounting on page 18 using Home-Based VMT per Resident.[4]	Yes, for residential projects on page 5 and Appendix 1 of OPR *Technical Advisory*.	No
Home-Based Work VMT per Employee (a partial VMT estimate) (also "Home-Based Work VMT Rate")	VMT by light-duty vehicles only for work trips (that is, trips that have one end at a workplace and one end at a residence), divided by number of employees.	Project Generated VMT Accounting on page 16 using Home-Based Work VMT per Employee.[4]	Yes, for office projects on page 6 and Appendix 1 of OPR *Technical Advisory*.	No
Project's Effect on VMT within the Boundary of a Specific Area (also "Boundary VMT")	VMT that occurs within a selected geographic boundary (e.g., City, County, or region) by any type of vehicle. This captures all on-road vehicle travel on a roadway network for any purpose, and includes local trips as well as trips that pass through the area without stopping.	Boundary VMT on page 22	Yes, for retail projects and transportation projects on pages 5, 6 and 23 and Appendix 1 of the OPR *Technical Advisory*.	Yes

Notes:

1. Each VMT metric is an option for baseline and/or cumulative impact analysis.
2. All VMT metrics listed in this table are described in the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018). See pages 5, 6 and 11, and Appendix 1 of the OPR *Technical Advisory*.
3. Total project generated VMT is derived from this VMT rate.
4. The project generated VMT accounting is similar to an origin-destination accounting used for many Climate Action Plans.

Source: Fehr & Peers, 2020.

Options, Limitations, and Considerations: VMT Metrics

Common Options

- Total Project Generated VMT
- Total Project Generated VMT per Service Population**
- Household Generated VMT per Resident (requires an activity/tour-based travel forecasting model)
- Home-Based VMT per Resident (a partial VMT estimate)
- Home-Based Work VMT per Employee (a partial VMT estimate)
- Project's Effect on VMT using Boundary VMT for a specific area

Common Limitations

Metrics other than total VMT and total VMT per service population typically only represent partial VMT (i.e., some vehicle types and trip purposes are excluded in the models used to estimate VMT). This may be acceptable for screening purposes but not for a complete VMT impact analysis. Project generated VMT metrics cannot capture how a project changes behavior of non-project residents or employees.

Considerations

The expectations of a CEQA impact analysis to strive to provide a complete picture of the effects of a project on the environment are highlighted within the *CEQA Statute & Guidelines*. For lead agencies, VMT metrics and method should consider current practice for air quality, greenhouse gases, and energy consumption impact analysis. In general, VMT is used as an input for these other analyses, and current practice is to produce VMT estimates and forecasts that comply with *CEQA Statute & Guidelines* expectations.

*** Service population includes population plus employment and may include students or visitors; it is intended to include all independent variables used in estimating trips.*

City of Cupertino Initial Recommendations: VMT Metrics

Include the following, so that all forms of VMT needed for screening and complete VMT analysis are available:

- Total project generated VMT
- Total project generated VMT per service population
- Home-based VMT per resident
- Home-based work VMT per employee
- Boundary VMT for an appropriate area affected by the project (needed for air quality, GHG, and energy analysis)

Chapter 4. VMT Calculation Methods

What Methods are Available to use in Estimating and Forecasting VMT?

VMT forecasts are generated using various forms of travel forecasting models that range from simple spreadsheets based on historic travel trends to complex computer models that account for numerous factors influencing travel demand. Possible travel forecasting models/tools include the following:

- **Travel Forecasting Models:** A travel forecasting model is a computer model used to estimate travel behavior for a specific horizon year based on land use and transportation network supply inputs. VMT is one output of a travel forecasting model run. The Caltrans Statewide Travel Forecasting Model, Metropolitan Transportation Commission (MTC) Regional Travel Forecasting Model, and VTA-C/CAG Bi-County Travel Forecasting Model are all examples of travel forecasting models.
- **Non-Model "Accounting Methods:"** In some cases where a travel model is not available or not appropriate, VMT can be estimated using sketch models or spreadsheet tools. VMT can also be estimated directly by multiplying the number of trips by an average trip length. Trips can be estimated using the results of local trip generation surveys or trip generation rate data published by the Institute of Transportation Engineers (ITE). Trip lengths can be extracted from models or from standardized averages or travel pattern data from the regional or sub-regional planning organization. Using trip length averages does not consider changes to the roadway network or traffic congestion, or the project's potential effects on overall travel patterns. These non-model "accounting methods" could also be paired with a travel model and used between major model updates or to estimate project generated VMT for small projects that would "get lost" in a model. The forthcoming VTA VMT Estimation Tool is an example of a VMT screening tool that uses outputs from a travel forecasting model and conducts off-model VMT reduction calculations to test potential transportation demand management strategies to reduce VMT.

Model Selection for Calculating VMT

An ideal tool for an SB 743 VMT analysis is a travel forecasting model that has been appropriately calibrated and validated for local project size and scale and has trip length data that accounts for trips that extend beyond the model boundary. Many travel forecasting models also account for travel patterns due to congestion, public transit, and non-motorized transit (walking and biking).

Travel Forecasting Models

The National Cooperative Highway Research Program *(NCHRP) Report 765, Analytical Travel Forecasting Approaches for Project-Level Planning and Design*, Transportation Research Board (TRB) (2014) is a detailed resource with many applicable sections. A few highlights related to forecasting expectations for models are listed below:

- A travel forecasting model should be sensitive to the policies and projects that the model is expected to help evaluate.
- Project-level travel forecasts should be validated following the guidelines of the *Travel Model Validation and Reasonableness Checking Manual*, *Second Edition,* from the Federal Highway Administration (FHWA).
- The model should be recalibrated frequently to ensure that validation standards are continuously met.

If used as the primary basis for calculating VMT, selection of an appropriate travel forecasting model is an important step. It is important for consistency because the model used to develop VMT thresholds should also be used to evaluate a project's direct and cumulative VMT impacts. The OPR *Technical Advisory* emphasizes this point (*Technical Advisory: On Evaluating Transportation Impacts in CEQA*, page 6).

> *"It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be [sic] use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures."*

The VTA Travel Model includes a more detailed representation of the City of Cupertino transportation network and land use patterns than the MTC model, and is the model that has most often been used for most project-specific applications in the City of Cupertino. A comparison of the available travel forecasting models for Cupertino is shown in **Appendix C**.

Using a travel forecasting model has some advantages over other methods, such as using sketch models or spreadsheet tools, because a travel model is better able to account for both project generated VMT and the project's effect on total area-wide VMT. A spreadsheet tool cannot evaluate project's effect on VMT. Both project generated and the project's effect on total VMT (as noted earlier) are important in a CEQA analysis. In addition, travel forecasting models can help identify the effects of transportation projects on VMT: for instance, would adding an additional vehicle lane induce new VMT, or cause people to drive who otherwise wouldn't have?

A travel forecasting model should have a base year and a future year, which are needed to evaluate project and cumulative impacts. As noted above, lead agencies have discretion to choose their analysis methods. However, if they prefer to establish thresholds that rely on regional averages of baseline VMT, then the travel forecasting model must cover a large enough area. The OPR *Technical Advisory* cites the importance of not truncating trip lengths based on travel forecasting model or political boundaries:

> ***Considerations for All Projects****. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.* (Quote from page 6 of the *Technical Advisory: On Evaluating Transportation Impacts in CEQA*, December 2018).

Most regional travel forecasting models used by metropolitan planning organizations (MPOs) have sufficient geographic coverage to produce these estimates, although they typically truncate trip lengths at the model boundary (usually meaning that inter-regional VMT is not fully captured without adjustments in the VMT forecasts). This can be an important limitation for cities or counties at the edge of the travel forecasting model boundary.

In addition to concerns related to truncating trips, most models cannot analyze transportation effects at the parcel or project level because the smallest unit of land use in a travel model is the transportation analysis zone.[17] These TAZ boundaries are not artificial; however, substantial effort is applied when designing a TAZ system boundaries and land use inputs. While a project may involve either one or several parcels, the smallest unit for which a VMT analysis should be conducted on (absent supporting substantial evidence of statistical validity) is the TAZ. As such, it does present a limitation for analysis of smaller areas at the sub-TAZ level. The response to this type of limitation is to modify the model to add detail and split TAZs.

Should an analyst identify noise or anomalies in the VMT results, further testing and investigation will be needed to diagnose and understand the cause and prepare an appropriate solution. The solution may result in minor refinements to the TAZ structure (as noted above), updating land use or transportation network inputs, or more comprehensive improvements to ensure that the travel model is sufficiently accurate and sensitive to local-scale applications.

The TAZ size also influences the types of streets vehicle traffic is typically assigned to. For a regional forecasting model, an arterial or minor arterial is the lowest street level that traffic is assigned to; for a sub-regional/local travel forecasting model, it is typically a collector or possibly local streets. As such, for most travel forecasting model uses, VMT on smaller streets is not calculated.

Lead agencies should be aware that regional models 'off the shelf' are often not sufficiently accurate or sensitive to local-scale applications such as individual land use project analysis. Calibration and validation

[17] As defined by *NCHRP Report 716, Travel Demand Forecasting: Parameters and Techniques*, TRB, 2012, "TAZ boundaries are usually major roadways, jurisdictional borders, and geographic boundaries and are defined by homogeneous land uses to the extent possible."

of the model within the project study area are typically needed, including refinements and modifications to better represent the project and its effects.

The OPR *Technical Advisory* states that sketch-level models may be used for project VMT analysis if the trip lengths are replaced with those from the local or regional model that was used to establish the lead agency's VMT thresholds. To be fully consistent, the trip generation estimates of the sketch model would also have to be replaced. Unfortunately, most travel forecasting models do not use typical project land uses as trip generation inputs, making this substitution difficult.

Non-Model Spreadsheets and Sketch Planning Tools

Sketch planning tools vary from simple spreadsheets that multiply a project's expected vehicle trip generation by an average trip length to more complex calculations that incorporate some level of land use context and project detail. Examples of the latter type of model include CalEEMod and the EPA's MXD+ methods for evaluating mixed-use projects, both of which are commonly used for trip generation or air quality analysis under current CEQA practice.

VTA is currently in the process of developing a web application that will screen and estimate project generated VMT and VMT reductions for land use projects in the City of Cupertino. The types of land use projects would include residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without ancillary retail space. The Santa Clara Countywide VMT Evaluation Tool (SCC VMT Estimation Tool) is modular, such that the VTA, along with the cities and towns in Santa Clara County and the County of Santa Clara can include their specific VMT screening requirements or VMT data within the SCC VMT Evaluation Tool. The web application is scalable such that it can be used for a range of project sizes and locations within any jurisdiction in Santa Clara County. This web application will include the home-based VMT per resident and home-based work VMT per employee, and has the potential to include total VMT per service population, boundary VMT, and a project's effect on VMT screening.

Options, Limitations, and Considerations: VMT Calculation Methods

Common Options

1. Caltrans Statewide Travel Demand Model
2. Metropolitan Transportation Commission (MTC) Regional Travel Forecasting Model
3. VTA-C/CAG Bi-County Travel Forecasting Model
4. Non-model "accounting methods," such as sketch planning tool or spreadsheet**

Common Limitations

1. Statewide and regional models have limited sensitivity and accuracy for local scale applications off the shelf.
2. Regional and local models often truncate trips at model boundaries.
3. Sketch and spreadsheet tools do not capture the 'project effect on VMT.'

Considerations

Selection of an appropriate travel forecasting approach is an important step because the tool used to develop VMT thresholds must also be used to evaluate a project's direct and cumulative VMT impacts. Regional or local models should be calibrated and validated for local project-scale sensitivity/accuracy (including appending trip length data for trips with external trip ends) before using these models to analyze both project generated VMT and project effect on VMT.

***Sketch planning tool or spreadsheet method has limitations if using a citywide or regional average for a threshold.*

City of Cupertino Initial Recommendations: VMT Calculation Methods

Use the VTA-C/CAG Bi-County model to assess projects large enough that the model would be sensitive to their changes to the built environment (dynamic testing of the travel model should be used to determine the model sensitivity to different project sizes). Use the Santa Clara Countywide VMT Evaluation Tool for baseline VMT screening or locally valid non-model VMT methods for projects where the travel model is not sensitive to changes.

Chapter 5. VMT Impact Significance Thresholds

Since SB 743 introduces a new mandatory metric for use in CEQA analysis, lead agencies will need to determine what constitutes acceptable and unacceptable levels of VMT. This process is generally referred to as establishing significance thresholds, and is governed by *CEQA Statute & Guidelines* Section 15064.7, which states the following:

> *15064.7. THRESHOLDS OF SIGNIFICANCE. (a) Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative, or performance level of an environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant. (b) Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. (c) When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.*

In more general terms, this indicates that agencies are now encouraged to formally adopt thresholds of significance for VMT, and that they have leeway to consider a wide variety of opinions from public agencies and experts. Ultimately, agencies have discretion to determine a threshold of significance, either on a case-by-case basis or through a more formal adoption process, provided that they can present substantial evidence that the threshold is set at a level that would normally be considered to have a significant environmental impact.

For projects that are not able to meet the established threshold, the VMT impact would be considered significant and unavoidable, preparation of an Environmental Impact Report (EIR) would be required, and approval of the project would require the adoption of a Statement of Overriding Considerations.

With regard to establishing thresholds for VMT, lead agencies have at least four options:

1) **Use Screening Criteria.**

   The concept of project screening is that some projects have characteristics that readily lead to the conclusion that they would not cause a VMT impact, and therefore could be screened out of doing a detailed VMT analysis. The *CEQA Statute & Guidelines* state that projects within ½ mile of a major transit stop or a stop along a high-quality transit corridor (i.e., with at least 15-minute

headways during peak hours) should be presumed to have no impact on VMT. In Cupertino, "transit priority areas" would include areas within ½ mile of Stevens Creek Boulevard east of De Anza College, which has high quality peak hour bus service.

In addition, the OPR *Technical Advisory* presents a method for "map-based" screening, where projects located in low-VMT areas may require only a qualitative discussion of their VMT effects, provided they comply with best practices for infill development. The areas that would qualify as "low-VMT" areas would depend on how the City defines its VMT metrics and thresholds. One method for conducting project screening is to develop a GIS-based mapping tool that shows the locations of the transit priority areas and the low-VMT areas, and allows the analyst to plot the project location to see if it meets the screening criteria.

Land use projects may also be screened out of further analysis if they are very small or can be demonstrated to primarily attract trips that would otherwise travel longer distance. Further, certain transportation projects, such as installation of bicycle/pedestrian/transit infrastructure, or projects designed to address a localized operational issue, can be presumed not to contribute to increased VMT.

2) Rely on the OPR Technical Advisory suggestion to set thresholds consistent with State of California goals for air quality, greenhouse gas, and energy conservation.

The OPR *Technical Advisory* contains suggested VMT thresholds. The basic suggested threshold is that each project achieves a VMT level that is at least 15% below regional baseline conditions. In the case of the City of Cupertino, its "region" would be the nine-county Bay Area, although comparison to a baseline for Santa Clara County may also be considered.

3) Use a threshold adopted or recommended by another public agency consistent with lead agency air quality, GHG reduction, and energy conservation goals.

The *CEQA Statute & Guidelines* offer the option for an agency to use a threshold that is adopted or recommended by another agency, as long as that decision is supported by substantial evidence. Other state agencies, such as Caltrans and the California Air Resources Board (CARB), have technical expertise that is relevant to this topic.

CARB has produced several reports and studies that speak to the level of VMT reduction, in conjunction with many other measures, that would lead to the achievement of California's GHG goals. Recent CARB publications have identified that new land use projects could contribute to these statewide goals by achieving total project generated VMT levels of at least 14.3% below the existing baseline (the CARB report does not specify whether this "baseline" is the regional average or some other baseline). For light-duty vehicles only, CARB cites a 16.8% reduction below baseline (2018) average VMT. However, the CARB analysis assumes that all of the regions in the state will meet the GHG reduction targets set in their Regional Transportation Plans and Sustainable Communities Strategies (RTP/SCS); thus far, indications are that not all regions are meeting those

targets, and vehicular travel in California (at least prior to the COVID-19 pandemic) has been increasing rather than decreasing over the past several years. Further, the CARB analysis does not account for any future increases in the use of Transportation Network Companies (such as Uber and Lyft) or commercial delivery services, nor does it envision the potential for development of autonomous vehicles or any other emerging transportation innovations. Therefore, there is growing evidence that the VMT reduction values from the CARB publication may not be enough to actually meet the State's GHG goals. Should current VMT generation trends persist, the threshold may need to increase to 25% below baseline (2018) average of jurisdiction (all vehicles).

Caltrans has released draft guidance endorsing the VMT thresholds published in the OPR *Technical Advisory*. Caltrans does acknowledge that each lead agency has the discretion to set its own significance thresholds, and they will be reviewing the evidence presented by any agency that uses a threshold that differs from those in the *Technical Advisory*.

Separately, Caltrans has released draft Interim Guidance on "*Determining CEQA Significance for GHG Emissions for Projects on the State Highway System*" that *recommends that any increase in GHG emissions would constitute a significant impact*. This has been referred to as the "Net Zero VMT Threshold." While Caltrans has thus far signaled that this threshold would be applied only to transportation projects, it does raise a question about whether a "net zero VMT" threshold should also be applied to land use projects and plans.

4) Develop jurisdiction-specific VMT threshold consistent with the existing General Plan.

Agencies may decide to set their own thresholds, which should be supported by substantial evidence and should support the three objectives laid out in SB 743: 1) reducing GHG emissions, 2) encouraging infill development, and 3) promoting active transportation. The process of setting thresholds should consider the policies and standards set in the RTP/SCS (i.e., Plan Bay Area), and should consider how much priority the City wants to place on the statewide GHG reduction goals. A targeted study could determine what level of VMT in Cupertino would be consistent with the VMT forecasts presented in Plan Bay Area and would represent the City's "fair share" of the State's GHG reduction goals.

Another option for setting a local threshold is to consider what level of VMT reduction is feasible to achieve in the local context. Analysis tools are available to estimate the amount of VMT reduction that can be achieved from different types of mitigation strategies deployed in different settings (as described further in **Chapter 6**). Applying these tools to the range of settings that exists in Cupertino would yield an estimate of the amount of VMT mitigation that could feasibly be achieved, and that figure could then be incorporated into a VMT threshold. Setting a threshold based on the feasibility of mitigation may not be fully supported by past CEQA practices; Fehr & Peers advises consulting legal counsel and continuing to follow legal developments before adopting this approach.

Establishing CEQA thresholds for VMT requires complying with the statutory language added by SB 743, as well as guidance contained in *CEQA Statute & Guidelines* Sections 15064, 15064.3, and 15064.7. The excerpts in **Appendix D** highlight the amendments to the two *CEQA Statute & Guidelines* sections that were certified by the California Natural Resources Agency and the Office of Administrative Law at the end of 2018.

In addition, the City must determine significance thresholds for each of the three project types: land use projects, land use plans, and transportation projects.

Context for Setting VMT Impact Thresholds

California law[18] states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses.

Determining an appropriate VMT significance threshold may ultimately depend on whether the courts treat VMT more like air pollution and less like a qualitative performance measure. If VMT causes adverse effects to human health similar to air pollution, then the threshold should be tied to substantial evidence (i.e., scientific studies) that relate VMT to human health (or human welfare or safety). If this effect varies by place type[19], then different thresholds may be appropriate for different place types (e.g., rural versus urban). Currently (May 2020), the limited scientific evidence related to VMT changes and their potential for causing adverse effects on human health is the CARB *2017 Scoping Plan*. This analysis did not differentiate by area type so a change in rural VMT has no different effect on humans than a change in urban VMT. The VMT would still generate the same amount of GHG emissions (and air pollutant emissions plus other indirect adverse effects) that would still have the same contribution to climate change.

On the other hand, if VMT is treated more like a qualitative performance measure, then lead agencies would discretion to establish thresholds based in part on context (i.e., amount of VMT on local streets). Past practice allowed lead agencies to set LOS thresholds based largely on the local community's sensitivity to travel delay. This is consistent with CEQA Guidelines Section 15064: "…An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area." Rural areas that were more sensitive to vehicle congestion were allowed to establish LOS thresholds that equated to lower levels of delay. Using this analogy, a lead agency could set VMT thresholds based on a community's sensitivity to the amount of vehicle travel or its associated effects.

[18] Section 21099 of California Public Resources Code establishes the required changes to the guidelines implementing CEQA as mandated in Senate Bill 743. Section 21099(b)(1) includes a requirement that the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse emissions, the development of multimodal transportation networks, and a diversity of land uses".

[19] A place type is a categorization system of neighborhood surrounding specific parcels in terms of land use density, general vehicle accessibility and access to transit, and land use. These factors have been shown to have a substantial effect on a location's ability to support low-VMT travel.

Is the use of VMT Impact Screening Desired?

There are several instances where the *CEQA Statute & Guidelines* allows for projects to be "screened" out of more detailed analysis. The screening process refers to a relatively quick assessment of the project based on screening criteria discussed below; if the project passes the screening assessment, it can be presumed to have a less-than-significant impact on VMT. Screening may be based on project location, project characteristics, or a combination of both. Lead agencies are responsible for deciding if projects may be screened from further analysis by determining, based on substantial evidence, which screening criteria they want to use for which project types, and where to set a screening "threshold."

Projects Located Near Frequent and High Capacity Transit

CEQA Statute & Guidelines § 15064.3(b) explicitly states that projects within ½ mile of a high-quality transit corridor or major transit station should be presumed to have no impact on VMT. A major transit station is a rail or ferry terminal, or the location where two high-frequency bus lines intersect. A major transit corridor is defined as a corridor with high-frequency bus service in the peak hour. In Cupertino, this mostly consists of Stevens Creek Boulevard east of De Anza College. The City has discretion whether to define these areas as ½-mile walksheds or 'as the crow flies.'

Projects Located in Low-VMT Generating Area

In addition, the OPR *Technical Advisory* presents a method for "map-based" screening, where projects located in low-VMT generating areas (expressed as a VMT rate such as VMT per capita) may require only a qualitative discussion provided they comply with planning best practices for infill development. A low VMT generating area is generally defined as one where the VMT per capita under Existing Conditions (based on a model run) is below the impact threshold adopted by the lead agency. The rationale behind screening based on location in a low-VMT generating area is that future residents, employees, and visitors are likely to have similar travel patterns to the current populations in the study area and that it is, therefore, reasonable to assume that a new project will have the same low-VMT generation rate as exists in the area. In other words, the new project would generate new VMT but it would be less than would be generated in other locations because the project is located in a low-VMT generating area, which has the net benefit of incrementally reducing the city, county and/or regional project generated VMT rate compared to locating the project in another area. Therefore, if a project includes elements that are substantially different from existing development patterns, additional analysis may be necessary even if the area has a low level of VMT generation under Existing Conditions.

Local-Serving Retail Projects

Local-serving retail is unlikely to have a substantial influence on local VMT. Smaller retail uses such as grocery stores, dry cleaners, pharmacies, and convenience stores tend to attract visitors from nearby neighborhoods. As an example, consider the effect of a new grocery store in an area without one. Residents of a neighborhood without a grocery store have to travel a great distance to an existing grocery store. Adding the grocery store to that neighborhood will shorten many of the existing grocery shopping

trips and reduce the VMT to/from the neighborhood, although it is unlikely to attract visitors who are already near an existing grocery store. While the definition of local-serving retail is somewhat subjective, a reasonable screening criterion may be a grocery store, pharmacy, or shopping center that does not exceed 50,000 square feet of retail space.

Specific Transportation Projects

Some transportation projects are highly unlikely to create VMT impacts, and can be presumed to have a less than significant impact on VMT. These include projects that reduce the number of lanes on a roadway ("road diets"), bicycle and pedestrian infrastructure projects, traffic calming projects, minor signal timing adjustments, and other roadway projects that are not intended to add vehicle capacity or reduce vehicle delay.

Projects with No Net VMT Increase

Some projects may be reasonably expected to have no net effect on the total boundary VMT on the roadway system. These would include like-for-like land use replacement projects, development of a site with a less-intensive land use than the existing land use, or any other project that is not expected to cause a change in travel behavior to or from the project site.

Affordable Housing Projects

The OPR *Technical Advisory* indicates that 100 percent affordable housing projects in infill locations may be screened from further analysis based on evidence that affordable housing both generates less VMT per capita than market-rate housing, and may help improve jobs-housing balance. The City may wish to develop its own screening criteria for residential projects (or residential portions of mixed-use projects) containing a particular amount of affordable housing, based on local circumstances and evidence.

Small Projects

The City may continue to issue guidance regarding when a full transportation impact analysis is necessary by, for instance, allowing the screening of small projects from VMT analysis, or requiring only qualitative VMT assessment for small projects. Screening based on small projects may wish to use the criteria cited in the OPR *Technical Advisory* (page 12) to screen projects that generate or attract fewer than 110 trips per day. Based on research for small project triggers[20], this may equate to nonresidential (e.g., office) projects of 10,000 square feet or less and residential projects of 20 units or less.

[20] Refer to technical memorandum on small project triggers in **Appendix E**.

Options, Limitations, and Considerations: Screening

Common Options

Projects that reduce VMT or are located within transit priority areas (TPAs) should be presumed to have a less than significant impact on VMT. Additional screening options identified in the OPR *Technical Advisory* for:

1. Map based screening for residential and office projects
2. Local-Serving Retail Projects
3. Transportation projects that do not add vehicle capacity
4. Projects that would not result in a net increase of VMT
5. Affordable housing projects
6. Small projects

Common Limitations

Screening does not provide information about the actual VMT changes associated with the project.

Considerations

Screening is most appropriate if consistent with applicable general plan and supported by substantial evidence.

City of Cupertino Initial Recommendations: Screening

For discussion during City Council Study Session.

Rely on screening if consistent with applicable general plan and supported by substantial evidence demonstrating cumulative VMT is declining. For project-by-project VMT analysis with VMT screening, most projects will likely not screen out, which will require a more complete VMT analysis.

Apply screening for the following project types:

- Small Developments
- Projects in Low-VMT Areas
- Projects in Proximity to Major Transit Stops
- Affordable Housing Projects
- Local-Serving Retail Projects less than 10,000 square feet
- Transportation Projects that do not add Vehicle Capacity

The Santa Clara Countywide VMT Estimation Tool will be applied for screening as follows:

- Low VMT generation map-based screening of residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without local serving retail space.
- Transit priority areas (TPAs)/major transit stops and high-quality transit corridor (HQTC) screening.

What is the VMT Impact Significance Threshold for Land Use Projects and Land Use Plans Under Baseline Conditions?

Specific VMT thresholds for residential, office (work-related), and retail land uses from the OPR *Technical Advisory* are summarized below.

- **Residential projects:** A proposed project exceeding a level of 15% below existing (baseline) VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as a regional VMT per capita, as a citywide VMT per capita, or as geographic sub-area VMT per capita.
- **Office projects:** A proposed project exceeding a level of 15% below existing (baseline) regional VMT per employee may indicate a significant transportation impact.
- **Retail projects:** A net increase in total (boundary) VMT may indicate a significant transportation impact.
- **Mixed-use projects:** Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each land use type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture.
- **Other non-residential project types:** OPR recommends using the quantified thresholds above; thus, a proposed project exceeding a level of 15% below existing regional VMT per employee for the proposed non-residential project type or resulting in a net increase in total VMT may be considered significant. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types.
- **Redevelopment projects:** Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would have a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As shown above, OPR does not make consistent recommendations for employment land use projects. In some cases, OPR recommends a 15% reduction in per capita VMT, in some cases no increase in boundary VMT, and in some cases OPR leaves threshold selection to jurisdiction discretion. Evidence is lacking on what justifies different treatments across different land use types. Lead agencies that use the above thresholds should be prepared to justify their reasoning and be able to explain it to project applicants, decision-makers, and the public.

The OPR *Technical Advisory* suggests that a VMT per capita of 15% below existing development may be an appropriate threshold for a significant impact. While there is ongoing discussion surrounding the substantial evidence behind this threshold, its documentation within an OPR document is substantial evidence that it represents an appropriate threshold. The 15% reduction for the office and residential land

uses specified in the *Technical Advisory* is for light-duty vehicle project generated VMT (i.e., passenger cars and light trucks). This presumption was included in the CARB modeling of MPO regional transportation plan/sustainable communities strategies (RTP/SCSs). The CARB *Scoping Plan* and *Mobile Source Strategy* identifies that a 14.3% reduction in total VMT per capita or a 16.8% reduction in light-duty vehicle VMT per capita from 2018 baseline levels is necessary to meet state GHG reduction goals by 2050. These reduction values are based on a fair share estimate of new development's responsibility for VMT reduction and assume that all California residents in the year 2050 will be traveling at the reduced VMT levels. If existing residents (meaning those present in 2018) do not change their travel behavior, and the full reduction in VMT must instead be allocated only to new growth, then the reduction goal for new developments would be much higher. Further, if VMT per capita trends continue to increase as noted in the *2018 Progress Report California's Sustainable Communities and Climate Protection Act*, California Air Resources Board, November 2018, then these reduction percentage values will have to increase. This number is discussed further in **Appendix D**.

OPR's *Technical Advisory* also recommends measuring VMT in absolute terms, which measures the total VMT in an area with and without the project. This approach is consistent with traditional CEQA analyses which measures impacts in comparison to existing conditions and with OPR's *CEQA Statute & Guidelines* amendments and OPR *Technical Advisory*, which state that (1) "Projects that decrease vehicle miles traveled in the project area compared to Existing Conditions should be presumed to have a less than significant transportation impact." (*CEQA Statute & Guidelines* § 15064.3(b)(1).) (2) "Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact." (*CEQA Statute & Guidelines* § 15064.3(b)(2).) (3) "Where development decreases VMT, lead agencies should consider the impact to be less than significant," (OPR *Technical Advisory*, p. 16.), (4) "Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact." (OPR *Technical Advisory*, p. 17.)

It should be noted that the recommendation above for mixed-use projects to focus the VMT analysis on the "dominant use" may present new challenges. The term "dominant use" is not defined in the CEQA statute or *CEQA Statute & Guidelines*. Because there are many ways to define it, taking this approach could create more legal arguments for challenging projects.

The City has several possible thresholds to consider. One of the options is based on State goals pertaining to air quality, GHG reduction, and energy conservation, while another option would be based on the existing City General Plan. Background on VMT thresholds and additional discussion of potential options are presented in **Appendix D**. The City must determine whether it wishes to analyze VMT impacts based on guidance from statewide agencies or the City's General Plan. If the City chooses to use statewide guidance, it must determine which agency's threshold to use, and its standards for determining substantial evidence for setting a threshold at that level. The primary consideration in determining what constitutes substantial evidence revolves around which goals the City focuses on (GHG emissions, promoting infill development, or promoting active transportation) and how trends in VMT are projected forward to meet those goals.

Set a Threshold Based on State Goals

This option sets a threshold consistent with a lead agency's air quality, GHG reduction, and energy conservation goals, assuming they are aligned with (or even exceed) State of California goals. Debate still exists about whether State goals as expressed in State plans, Governor executive orders, etc., constitute environmental thresholds. Nevertheless, OPR, CARB, and Caltrans have articulated quantitative estimates for VMT/GHG reduction needed to achieve State GHG reduction goals.

Given the CARB regulatory responsibility related to emissions and the Caltrans owner/operator responsibility for the state highway system, their published guidance for VMT impact analysis should be recognized and at least discussed in transportation impact analyses. Including this information will help inform decision makers and the public how the State of California and these specific agencies view the VMT effects of projects. One benefit of relying on state agencies for a threshold recommendation is a *CEQA Statute & Guidelines* provision in Section 15064.7(c) that indicates "a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts."

At this time, there are four published percent reduction targets, and a possible Caltrans-recommended threshold:

- OPR: 15% below baseline average for a city or region (light-duty vehicles only).[21]
- CARB: 14.3% below baseline (2018) average of jurisdiction (all vehicles, assuming that MPOs meet SB 375 targets).
- CARB: 16.8% below baseline (2018) average of jurisdiction (light-duty vehicles only, assuming that MPOs meet SB 375 targets).
- CARB: 25% below baseline (2018) average of jurisdiction (all vehicles, assuming that MPOs do not meet SB 375 targets).
- Net zero VMT (the threshold that Caltrans has indicated they are likely to recommend for transportation projects that affect the state highway system[22]).

The OPR *Technical Advisory* makes specific VMT threshold recommendations for analyzing the impact of project generated VMT compared to baseline conditions, but also recommends that VMT analysis consider a project's long-term effects on VMT. The OPR *Technical Advisory* states (p. 6):

[21] The OPR and CARB thresholds do not consider the long-term influence of transportation network companies, internet shopping, new mobility options, or autonomous vehicles.

[22] Caltrans is developing a threshold recommendation for land use projects for intergovernmental review (IGR) purposes. Local jurisdictions should consider whether a Caltrans or (CARB) threshold constitutes a state threshold that must be applied in addition to their local threshold preference similar to past practices for LOS impact analysis of the state highway system.

> *[W]here methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.*

Another factor for consideration is whether the project is consistent with the applicable RTP/SCS (i.e., Plan Bay Area). Although OPR recommends that such consistency not be the sole basis for impact analysis (p. 22), it can be considered in conjunction with other factors especially whether a project would jeopardize the RTP's air quality conformity, which is tied directly to VMT. These recommendations raise key questions for lead agencies, as addressed in the next section.

Set a Threshold Consistent with Existing General Plan

This option relies on the VMT growth "budget" established in the general plan and associated EIR. A General Plan establishes how much growth is anticipated in the jurisdiction, where that growth will occur and in what forms, and the transportation network modifications necessary to support that growth. VMT is a composite metric that results from this combination of General Plan land use and transportation decisions. Therefore, each adopted General Plan in California effectively already has a VMT growth budget implied within that plan that the adopting agency has accepted.

This could be a starting point for threshold expectations and can be quantified using the lead agency's travel forecasting model, if one exists, or from regional travel forecasting models used to develop the region's RTP/SCS. The incremental difference between base year and future year VMT generated by the jurisdiction in these models represents currently accepted VMT levels. The VMT can be expressed in absolute terms or as an efficiency metric, such as total VMT per service population to create a VMT impact threshold tied exclusively to the General Plan. Projects can be evaluated using the appropriate travel forecasting model to determine whether they cause an increase in the incremental total VMT growth for the jurisdiction or would generate VMT at a higher rate than anticipated by the General Plan for the relevant traffic analysis zone(s).

The main limitation of this approach is that the City of Cupertino's adopted General Plan was developed prior to State of California approval of a variety of new laws related to climate change and GHG reduction. As such, the General Plan may not be consistent with State expectations for emissions and VMT reductions and all the other local community objectives.

Additional Considerations for Land Use Plans

Rather than analyzing VMT for each proposed land use project individually, a jurisdiction may choose to complete VMT impact analysis as part of its General Plan EIR and make specific use of *CEQA Statute & Guidelines* Section 15183 (See **Appendix D** for additional discussion). Setting a threshold for the General Plan itself and analyzing VMT impacts in the General Plan EIR could exempt projects consistent with the General Plan from further VMT impact analysis. The jurisdiction may adopt a threshold that is based on substantial evidence, use it in the General Plan EIR, determine if VMT impacts are significant, mitigate to the extent feasible, and adopt a statement of overriding consideration if determined to be appropriate.

The lead agency can then tier from the General Plan EIR for projects that are consistent with the General Plan without doing additional VMT impact analysis.

VMT Data From Existing Sources

To provide context and as a point of comparison for the VTA Travel Model baseline data presented later in this Chapter, VMT data for Cupertino was compiled from two existing sources: the 2012 California Household Travel Survey (CHTS) and the California Statewide Travel Demand Model (CSTDM).

California Household Travel Survey

Table 2 shows VMT results from the CHTS. The survey was conducted in 2012, and remains the most recent available comprehensive household travel survey that includes the City of Cupertino. Because the survey is based on households, statistics are presented separately for VMT per resident and VMT per employee. Non-household travel (such as deliveries, freight, etc.) is not represented in the CHTS data, because the survey focuses on households only. CHTS data is not directly comparable to the VMT metrics produced by the VTA model; the CHTS asks respondents about their entire travel tour throughout the course of the day, whereas the VTA model estimates each trip separately.

Table 2: CHTS (2012) VMT Estimates

VMT Metric	City of Cupertino
Average Daily VMT per Resident	16.2 miles
Average Daily Home-Based VMT per Resident	12.0 miles
Percent of Residential VMT that is Home-Based	74 %
Average Daily Home-Based Work VMT per Person Trip (Cupertino Employee)	12.0 miles
Sample of Residents and Employees	191 residents / 76 employees

Source: Caltrans 2013 (https://www.nrel.gov/transportation/secure-transportation-data/tsdc-california-travel-survey.html). Fehr & Peers, 2020.

California Statewide Travel Demand Model

Table 3 shows VMT results from the CSTDM. Base year of the model is 2010. It should be noted that travel analysis zone (TAZ) boundaries in the model do not align directly with the Cupertino city boundary; we have selected the set of TAZs that most closely matches the city boundary.

Table 3: CSTDM (2010) VMT Estimates

VMT Metric	City of Cupertino
Home-Based VMT	781,470
Residents	64,280
Home-Based VMT per Resident	12.2
Home-Based Work VMT	702,170
Employees	43,520
Home-Based Work VMT per Employee	16.1

Note:

1. VMT, residents, and employees rounded to nearest 10.

Source: Caltrans 2015 (https://dot.ca.gov/programs/transportation-planning/multi-modal-system-planning/statewide-modeling [Caltrans website updates may limit available data]), Fehr & Peers 2020.

Options, Limitations, and Considerations: Baseline VMT Thresholds

- Lead agency discretion consistent with general plan and expectations for 'project scale' VMT reductions not accounted for in General Plan EIR and supported by substantial evidence.
- OPR 15 % below baseline average for a city or region (light-duty vehicles only, based on initial assessment of feasibility and requirements to meet statewide GHG goals).** This could potentially also be applied to below a baseline average for a place type.
- CARB 14.3 % below baseline (2018) average of jurisdiction (all vehicles, presuming that MPOs meet SB 375 targets). This could potentially also be applied to below a baseline average for a place type.
- CARB 16.8 % below baseline (2018) average of jurisdiction (light-duty vehicles only, presuming that MPOs meet SB 375 targets). This could potentially also be applied to below a baseline average for a place type.
- CARB 25 % below baseline (2018) average of jurisdiction (all vehicles, presuming that MPOs do not meet SB 375 targets). This could potentially also be applied to below a baseline average for a place type.
- Pending Caltrans-recommended threshold (net zero VMT)

Common Limitations

Difficult for lead agencies to determine what level of VMT change is unacceptable when viewed solely through a transportation lens.

Uncertainty of VMT trends contributes to difficulty in setting thresholds. Connecting a VMT reduction expectation to baseline helps to reduce uncertainty associated with future conditions.

City of Cupertino Initial Recommendations: Baseline VMT Thresholds

For discussion during City Council Study Session.

Set baseline VMT threshold based on long-term statewide expectations for air quality and GHG emissions. Example baseline thresholds are as follows.

- Land Use Projects
  - Project Impact: A significant impact would occur if the VMT rate for the project would exceed a level of X% below the countywide baseline VMT rate.
  - Project Effect: A significant impact would occur if the project increases total (boundary) citywide VMT compared to baseline conditions.
- Land Use Plans:
  - Project Impact: A significant impact would occur if the VMT rate for the plan area would exceed a level of X% below the countywide baseline VMT rate.

Considerations

Since VMT is already used in air quality, GHG, and energy impact analysis, lead agencies should review thresholds used for those analyses to help inform new thresholds exclusively for transportation purposes.

Lead agencies should carefully consider how they value state goals for VMT/GHG reduction in light of other General Plan and community objectives. Translating State of California goals into VMT thresholds should consider substantial evidence such as California Air Resources Board 2017 Scoping Plan - Identified VMT Reductions and Relationships to State Climate Goals, January 2019, CARB.

Absent development of a specific VMT threshold, lead agencies may rely on those of other state agencies. The ARB thresholds are supported by substantial evidence related to state air quality and GHG goals, but do not consider recent VMT trends or the potential influence of emerging mobility options such as autonomous vehicles (AVs).

***The OPR and CARB thresholds do not consider the long-term influence of transportation network companies, internet shopping, new mobility options, or autonomous vehicles.*

What is the VMT Impact Significance Threshold for Land Use Projects and Land Use Plans Under Cumulative Conditions?

An impact under CEQA begins with a change to the existing environment, and therefore Existing (or Baseline) Conditions and Existing with Project Conditions must be evaluated. Because VMT will fluctuate with population and employment growth, changes in economic activity, and changes in travel modes including the expansion of new vehicle travel choices (i.e., the emergence of transportation network companies such as Uber and Lyft, autonomous vehicles, etc.), an impact analysis must also take into account the cumulative effects of the proposed project, these changes, and all other projects. Therefore, evaluations of Cumulative Conditions and Cumulative with Project Conditions are needed to identify potential cumulative impacts.

Pages 5 and 6 of the OPR *Technical Advisory* recommend considering a project's short-term, long-term, and cumulative effects on VMT. The first reference is on page 5, related to retail projects, while the references on page 6 are for all projects (see excerpts below with most relevant portions underlined).

> ***Retail Projects***. *Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT*[11] *because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.* (Quote from page 5 of the *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018; footnote 11 in this quote is a reference to see Appendix 1 of the OPR *Technical Advisory*, which discusses evaluation of Total VMT – OPR is referring to boundary VMT.).
>
> ***Considerations for All Projects***. *Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.* (Quote from page 6 of the *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018).
>
> ***Cumulative Impacts***. *A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).)* (Quote from page 6 *of* the *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018).

The inclusion of project's effect for retail has raised the question about whether it would also be appropriate for other land uses. A complete analysis that considers the project's effect on VMT is important because land use projects can influence the routing of existing trips and the VMT generation of surrounding land uses. Combined with the expectations established in the *CEQA Statute & Guidelines* and CEQA case law, ignoring the project's effect on VMT may not fully disclose the potential effects on the environment.

Cumulative VMT Threshold Options

As noted earlier, a Cumulative VMT threshold should be able to evaluate the direct, indirect, and cumulative effects of a project on VMT and consider uncertainty of VMT trends, such as transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Below is a brief summary of three possible cumulative VMT threshold options:

- **Fair Share of Regional VMT Allocation:** Use a regional model to analyze the project's effect on VMT based on RTP/SCS (e.g., Plan Bay Area) consistency (projects should not increase the total project generated regional VMT forecast used to support the RTP/SCS air quality conformity and SB 375 GHG targets).
- **Cumulative VMT Thresholds is the Same as Baseline VMT Threshold**: A lead agency can use the baseline VMT threshold (used for a Project Conditions evaluation of the project) if the baseline VMT efficiency metric is trending downward under Cumulative Conditions.
- **Long-Term Air-Quality and GHG Expectations**: Establish a VMT reduction threshold for Cumulative Conditions consistent with long-term air pollution and GHG reduction expectations.

All three of these options require knowledge of the forecasting tools available to test the project's effect on land use supply and VMT. Overall, the evaluation of the project's effect on land use and VMT should use the most appropriate forecasting model and consider all substantial evidence including the California Air Resources Board *2017 Scoping Plan-Identified VMT Reductions and Relationships to State Climate Goals*, CARB and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Any cumulative VMT forecasting should acknowledge that land use projects and plans typically do not influence regional land use control totals and that modeling scenarios should carefully consider the land use allocation between scenarios and/or the VMT metric used to establish the cumulative VMT threshold.

Options, Limitations, and Considerations: Cumulative VMT Thresholds

Common Options

For analysis of cumulative VMT effects, the City can choose from the following options:

1. Use a regional travel model to analyze the project's effect on VMT based on RTP/SCS (i.e., Plan Bay Area) consistency (projects should not increase the regional total project generated VMT or total boundary VMT forecast used to support the RTP/SCS air quality conformity and SB 375 GHG targets).
2. A lead agency can use the project analysis above if based on an efficiency metric form of VMT and evidence exists to demonstrate that cumulative trends in VMT rates are declining.
3. Establish a VMT reduction threshold for cumulative conditions consistent with long-term air pollution and GHG reduction expectations.

Common Limitations

Uncertainty of VMT trends makes a cumulative impact finding less certain.

Ability for a lead agency to identify the project's effect on land supply and corresponding VMT. Land use projects change land supply and the allocation of future population and employment growth. As such cumulative analysis should maintain the same control totals of regional population and employment growth.

Requires knowledge of the forecasting tools available to test the project's effect on land supply and VMT.

Considerations

Analyze the project's effect on land supply and VMT using an appropriate valid model. For impact findings, consider all available substantial evidence including 2018 Progress Report, California's Sustainable Communities and Climate Protection Act, November 2018, CARB and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Specific research examples include Fehr & Peers AV effect model testing.

City of Cupertino Initial Recommendations: Cumulative VMT Thresholds

For discussion during City Council Study Session.

Analyze the project's effect on land supply and VMT using an appropriately valid travel model. For impact findings, consider all available substantial evidence including California Air Resources Board *2017 Scoping Plan Identified VMT Reductions and Relationships to State Climate Goals*, January 2019, and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). The following are suggested cumulative thresholds.

- Land Use Projects:
  - Project Effect: A significant impact would occur if the project increases total (boundary) citywide VMT compared to cumulative no project conditions.
- Land Use Plans:
  - Project Effect: A significant impact would occur if growth in the plan area increases total (boundary) citywide VMT compared to cumulative no project conditions.
- All land use and transportation projects: A significant impact would occur if the project is inconsistent with the Regional Transportation Plan/Sustainable Community Strategy Plan (Plan Bay Area).

What is the VMT Impact Significance Threshold for Transportation Projects Under Baseline and Cumulative Conditions?

Transportation projects have the potential to change travel patterns and may lead to additional vehicle travel on the roadway network, also referenced as induced vehicle travel (OPR *Technical Advisory*, pp. 19-23, and Appendix 2). For roadway capacity expansion projects, under *CEQA Statute & Guidelines* Section 15064.3(b)(2), lead agencies have the discretion to determine the appropriate measure of transportation impacts. Lead agencies may consider retaining current practices, such as using LOS thresholds as identified in the General Plan, but should evaluate whether use of LOS still complies with the new *CEQA Statute & Guidelines* expectations in Sections 15064.3, 15064, and 15064.7. Lead agencies that do not choose to use VMT to measure the impacts of transportation projects will still need to analyze VMT as an input to air quality, GHG, and energy impact analysis. For transportation projects that increase roadway capacity, the VMT estimates and forecasts will also need to include induced travel effects that lead agencies may not have included in past practice. However, not all roadway projects will lead to induced travel.

Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges. OPR's *Technical Advisory* provides an extensive list of projects which are unlikely to lead to induced travel, including addition of roadway capacity on local or collector streets provided the project also substantially improves multimodal conditions. (OPR *Technical Advisory*, pp. 20-21.) Appendix 2 to OPR's *Technical Advisory* provides specific guidance on calculating induced vehicle travel.

Assuming VMT is used as the metric, transit (except for on-demand transit) and active transportation projects may be considered to have less than significant impact.

Options, Limitations, and Considerations: Baseline and Cumulative Transportation Thresholds

Common Options

Lead agencies have discretion to choose their own metrics and thresholds for transportation project impact analysis. If VMT is selected, OPR recommends treating projects that reduce or have no impact on VMT to be presumed to have a less than significant impact.

Common Limitations

Continued use of LOS is uncertain because of *CEQA Guidelines* Section 15064.3(b)(2) and 15064.7(d)(2).
Transit, especially on-demand transit service, can generate new VMT, which should be considered as part of impact conclusions.

Considerations

Consult CEQA legal advice about whether lead agency discretion allows continued use of LOS and whether VMT is required. VMT is required as an input to air quality, GHG, and energy impact analysis and should include induced vehicle travel effects.

City of Cupertino Initial Recommendations: Baseline and Cumulative Transportation Thresholds

For discussion during City Council Study Session.

- Baseline Transportation Threshold: A significant impact would occur if a project causes a net increase in total regional VMT compared to baseline conditions or opening year no project conditions.
- Cumulative Transportation Threshold: A significant impact would occur if the project causes a net increase in total regional VMT compared to cumulative no project conditions.

Cupertino Baseline and Cumulative VMT Threshold Options

To describe a threshold, the City is making several methodological decisions:

- **VMT Metric**: The first decision facing the City is which VMT metrics to use to express a project's transportation effects. VMT metrics fall into two general categories: absolute VMT and per capita VMT. Per capita VMT is also referred to as an efficiency metric, as it does not vary directly with project size. VMT metric options for baseline and/or cumulative VMT impact analysis include total project generated VMT, total project generated VMT per service population, home-based VMT per resident, home-based work VMT per worker, and boundary VMT.

- **Selecting the VMT Reduction to Apply to the VMT Metric:** Once the VMT metric is selected, the next decision is to define a percent reduction in the VMT metric that will be required to avoid triggering a significant impact. As discussed earlier, the percent reduction could be based on state or City of Cupertino General Plan long-term expectations for greenhouse gas, air quality, and energy conservation.
- **Selecting the Geographic Area of the VMT Metric**: The final decision is to decide on what geographic area (e.g., City-level, County-level, or Region-level) will be used to define the average value that a project should be compared to.

The VTA Travel Model was used to prepare baseline and cumulative VMT estimates for the following VMT metrics for three geographic areas (e.g., City-level, County-level, and Region-level); in all cases, and consistent with the recommendations in the OPR Technical Advisory, adjustments have been applied to account for the distance of travel outside of the model area (see **Appendix F** for external station adjustments and VMT values before the adjustments):

- Total Project Generated VMT – Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, presented as a total project generated VMT. Also summarized is the Total VMT per service population (i.e., sum of residents plus employees).
- Total VMT per service population – Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, divided by the sum of residents plus employees in the analysis area generating the VMT.
- Home-Based VMT per Resident – VMT generated by light-duty vehicles (i.e., private cars and trucks) for all trips that begin or end at a residential land use, divided by residents.
- Home-Based Work VMT per Employee – VMT by light-duty vehicles only for work trips (that is, trips that have one end at a workplace and one end at a residence), divided by number of employees.
- Project's Effect on VMT within the Boundary of a Specific Area (Boundary VMT) – VMT that occurs within a selected geographic boundary (e.g., City, County, or region) by any type of vehicle. This captures all on-road vehicle travel on a roadway network for any purpose, and includes local trips as well as trips that pass through the area without stopping.

While it is difficult for a lead agency to determine what level of VMT change is unacceptable when viewed solely through a transportation lens, there are several possible VMT threshold options, depending upon whether the City chooses to use a threshold based on state or local policies. The following sections present the baseline and cumulative VMT estimates and VMT threshold options for each VMT metric based on:

- **State goals pertaining to air quality, GHG reduction, and energy conservation**. The California Air Resources Board (CARB) has produced several reports and studies that speak to the level of VMT reduction, in conjunction with many other measures, that would lead to the achievement of California's GHG goals. Recent CARB publications have identified that new land use projects could contribute to these statewide goals by achieving total project generated VMT levels of at least

14.3% below the existing baseline. For light-duty vehicles only, CARB cites a 16.8% reduction below baseline (2018) average VMT. However, the CARB analysis assumes that all of the regions in the state will meet the GHG reduction targets set in their Regional Transportation Plans and Sustainable Communities Strategies (RTP/SCS).[23]

- **Cupertino-specific VMT thresholds consistent with the City General Plan**. Another option for setting a local threshold is to consider what level of VMT reduction is feasible to achieve in the local context.[24]

VMT Modeling Methods and Reference Years

Baseline VMT are produced using the VTA Travel Model last updated in late 2019. A review of the VTA Travel Model is presented in **Chapter 4** and **Appendix C**. This version of the VTA Travel Model uses 2015 as its base year, and 2040 as its cumulative horizon year. The data presented below are based on recent model runs as of September 2020 with adjustments made to include travel outside of the model area (an adjustment that adds 3 to 5 percent to the geographic VMT values) (see **Appendix F** for the external station adjustments).

As described earlier, VMT is the result of the land use and transportation network inputs for a given model year. The land use input for this VMT analysis is the service population that generates the VMT. The service population is the sum of the number of employees plus residents. **Table 4** shows the service populations used in the VMT metrics for the City of Cupertino, Santa Clara County, and the Bay Area region (e.g., Sonoma, Marin, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo County, and San Francisco counties).

[23] Thus far, indications are that not all regions are meeting those targets, and vehicular travel in California (at least prior to the COVID-19 pandemic) has been increasing rather than decreasing over the past several years. Further, the CARB analysis does not account for any future increases in the use of Transportation Network Companies (such as Uber and Lyft) or commercial delivery services, nor does it envision the potential for development of autonomous vehicles or any other emerging transportation innovations. Therefore, there is evidence that the VMT reduction values from the CARB publication may not be enough to actually meet the State's GHG goals. Should current VMT generation trends persist, the threshold may need to increase to 25% below baseline (2018) average of jurisdiction (all vehicles).

[24] Background on VMT thresholds and additional discussion of potential options can be found in Chapter 5 and Appendix D of this white paper.

Table 4: Service Population

Land Use	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change[6]
City of Cupertino[1]			
Residents (A)	59,680	72,740	21.9%
Employees (B)	34,990	45,100	28.9%
Service Population (A+B = C)	94,670	117,840	24.5%
Santa Clara County[2]			
Residents (A)	1,856,250	2,553,720	37.6%
Employees (B)	1,040,510	1,302,710	25.2%
Service Population (A+B = C)	2,896,760	3,856,430	33.1%
Bay Area Region[3]			
Residents (A)	7,501,730	9,648,460	28.6%
Employees (B)	3,765,970	4,711,200	25.1%
Service Population (A+B = C)	11,267,700	14,359,660	27.4%

Notes: Population values rounded to nearest 10.

1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.
6. Percent change is between 2015 and 2040.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

The service population is expected to increase by 24.5 percent in Cupertino, 33.1 percent for Santa Clara County, and 27.4 percent for the Bay Area region. These growth rates of residents and employees have a direct influence on the VMT growth rates for each of the geographic areas described below.

VMT Threshold Options

The results of each of the VMT metrics are presented in **Tables 5** to **8** for the Existing (Baseline) Condition and Cumulative Condition for the City of Cupertino, Santa Clara County, and Bay Area region.

Table 5: Total Project Generated VMT

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change[6]
City of Cupertino[1]			
Total Project Generated VMT (A)	3,219,660	3,792,470	17.8%
Service Population (B)	94,670	117,840	24.5%
Total VMT per Service Population (A/B = C)	34.0	32.2	-5.3%
Santa Clara County[2]			
Total Project Generated VMT (A)	81,374,770	103,892,170	27.7%
Service Population (B)	2,896,760	3,856,430	33.1%
Total VMT per Service Population (A/B = C)	28.1	26.9	-4.3%
Bay Area Region[3]			
Total Project Generated VMT (A)	274,475,030	350,889,420	27.8%
Service Population (B)	11,267,700	14,359,660	27.4%
Total VMT per Service Population (A/B = C)	24.4	24.4	0.0%

Notes: Population and VMT values rounded to nearest 10.

1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.
6. Percent change is between 2015 and 2040.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

The total project generated VMT presented in **Table 5** is the expected VMT growth "budget" established by the City's General Plan transportation network and land use growth assumptions. Because the City's project generated VMT is expected to grow at a slower rate than its service population, the City of Cupertino total VMT per service population rate is expected to decrease over time. The Santa Clara County total VMT per service population rate is also decreasing, but the Bay Area region total VMT per service population rate is very slightly increasing. This downward trend in the total VMT per service population in Cupertino is an important observation that will help establish a City specific VMT threshold and a VMT mitigation action approach that would apply under baseline and cumulative conditions. It also means that the City could consider the results of a baseline total VMT per service population may be sufficient for some land use project types.

Under Existing Conditions, the City of Cupertino has a total VMT per service population rate that is 21 to 39 percent greater than the Santa Clara County or the Bay Area region total VMT per service population rates, respectively. Based on earlier discussions potential VMT thresholds using total VMT per service population include:

- Set a Threshold Based on State Goals:
    - 14.3% below baseline average of the City, County, or Region (all vehicles, presuming that the Bay Area MPO Region meets SB 375 GHG targets).
    - 25% below baseline average of the City, County, or Region (all vehicles, presuming that the Bay Area MPO Region does not meet SB 375 GHG targets).
- Set a Threshold Consistent with the General Plan
    - X% (TBD) below baseline average of the City to achieve long-term General Plan goals for GHG emissions, air quality, and energy conservation.[25]

Table 6: Home-Based VMT per Resident

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change[6]
City of Cupertino[1]			
Home-Based VMT (A)	817,210	954,990	16.9%
Residents (B)	59,680	72,740	21.9%
Home-Based VMT per Resident (A/B = C)	13.7	13.1	-4.4%
Santa Clara County[2]			
Home-Based VMT (A)	25,036,430	32,465,220	29.7%
Residents (B)	1,856,250	2,553,720	37.6%
Home-Based VMT per Resident (A/B = C)	13.5	12.7	-5.9%
Bay Area Region[3]			
Home-Based VMT (A)	105,371,020	135,305,680	28.4%
Residents (B)	7,501,730	9,648,460	28.6%
Home-Based VMT per Resident (A/B = C)	14.0	14.0	0%

Notes:
1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.
6. Percent change is between 2015 and 2040.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

[25] To calculate this value requires estimates of Citywide GHG emissions, air quality emissions, and energy consumption to determine the VMT budget that would achieve long-term emissions expectations. Alternatively, the threshold could be established if the City choose a boundary VMT threshold between 0 to 6.5% increase in boundary VMT on the streets and freeways within the City's geographic boundary.

The Cupertino home-based VMT per resident, which includes only trips that begin or end at a resident's home, is within 15 percent of the average daily home-based VMT per resident from the CHTS (see **Table 2** on page 42 of this white paper). This indicates that the VTA Travel Model values are in-line with survey data for residential travel in Cupertino.

CSTDM estimates for Cupertino are within 12 percent of the per capita rates presented in the 2015 baseline VTA Travel Model runs for home-based VMT. Given the differing TAZ structures and different base years between the two travel forecasting models, this difference is small enough to indicate that each model would produce roughly similar VMT findings.

The City's home-based VMT is expected to grow at a slower rate than its residential population, which means that the City of Cupertino home-based VMT per resident is expected to decrease over time. The Santa Clara County home-based VMT rate is also decreasing, but the Bay Area Region home-based VMT rate is increasing. This downward trend in the home-based VMT per resident is an important observation that helps establish a City specific VMT threshold and a VMT mitigation action approach that would apply under baseline and Cumulative Conditions with minimal if any remedial actions. It also means that the City could consider the results of a baseline home-based VMT per resident may be sufficient for screening some land use project types.

Under Existing Conditions, the City of Cupertino has a home-based VMT per resident that is 1.5 percent greater than the Santa Clara County home-based VMT per resident and 2.1 percent less than the Bay Area Region home-based VMT per resident. Based on earlier discussions potential VMT thresholds using home-based VMT per resident include:

- Set a Threshold Based on State Goals:
    - 15% below baseline average of the City, or Region (light-duty vehicles only, presuming that the Bay Area MPO meets SB 375 GHG targets).
    - 16.8% below baseline average of the City, County, or Region (light-duty vehicles only, presuming that the Bay Area MPO meet SB 375 targets).
- Set a Threshold Consistent with Existing General Plan
    - Same VMT threshold options as total VMT per service population.

Table 7: Home-Based Work VMT per Employee

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change[6]
City of Cupertino[1]			
Home-Based Work VMT (A)	606,990	802,640	32.2%
Employees (B)	34,990	45,100	28.9%
Home-Based Work VMT per Employee (A/B = C)	17.3	17.8	2.9%
Santa Clara County[2]			
Home-Based Work VMT (A)	17,527,760	22,467,000	28.2%
Employees (B)	1,040,510	1,302,710	25.2%
Home-Based Work VMT per Employee (A/B = C)	16.8	17.2	2.4%
Bay Area Region[3]			
Home-Based Work VMT (A)	58,100,880	75,888,500	30.6%
Employees (B)	3,765,970	4,711,200	25.1%
Home-Based Work VMT per Employee (A/B = C)	15.4	16.1	4.5%

Notes:
1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.
6. Percent change is between 2015 and 2040.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

For employees working in Cupertino, the VTA Travel Model produces home-based work (i.e., commute) VMT of around 17.3 daily VMT. CHTS data presents only average home-based work vehicle trip lengths, summarized in **Table 2** (on page 42) as average VMT per person trip for employees working in Cupertino. CHTS data are one-way; assuming a typical employee who drives to work commutes round-trip each way, CHTS trip lengths are around 39 percent higher than the VMT per employee value presented in the model (24 VMT vs. 17.3 VMT). However, it is worth noting that the number of individual survey respondents who reported working in Cupertino was quite small (less than 200 survey respondents), and therefore there may be an outsize effect from the 10 percent or so of respondents who reported one-way commute distances greater than 30 miles.

CSTDM estimates for Cupertino are within 10 percent of the per capita rates presented in the 2015 baseline VTA Travel Model runs for home-based VMT and home-based work VMT. Given the differing TAZ structures and different base years between the two travel forecasting models, this difference is small enough to indicate that each model would produce roughly similar VMT findings.

The City's home-based work VMT is expected to grow at a faster rate than its employment population, which means that the City of Cupertino home-based work VMT per employee is expected to increase over

time. The Santa Clara County and Bay Area region home-based work VMT rates are increasing too. This upward trend in the home-based work VMT per employee is an important observation that will help establish a City specific VMT threshold and a VMT mitigation action approach. However, because of this upward trend in the home-based work VMT per employee a baseline VMT screening analysis may not be enough to evaluate the cumulative effects of the project and the project's effect on VMT.

Under Existing Conditions, the City of Cupertino has a home-based work VMT per employee that is 3 percent greater than the Santa Clara County home-based work VMT per resident and 12.3 percent greater than the Bay Area region home-based work VMT per employee. Based on earlier discussions potential VMT thresholds using home-based VMT per resident include:

- Set a Threshold Based on State Goals:
    - Same VMT threshold options as home-based VMT per resident.
- Set a Threshold Consistent with Existing General Plan
    - Same VMT threshold options as total VMT per service population.

Table 8: Boundary VMT

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change[6]
City of Cupertino[1]			
Boundary VMT (A)	1,334,580	1,540,860	15.5%
Service Population (B)	94,670	117,840	24.5%
Boundary VMT per Service Population (A/B = C)	14.1	13.1	-7.1%
Santa Clara County[2]			
Boundary VMT (A)	40,230,830	51,189,820	27.2%
Service Population (B)	2,896,760	3,856,430	33.1%
Boundary VMT per Service Population (A/B = C)	13.9	13.3	-4.3%
Bay Area Region[3]			
Boundary VMT (A)	157,088,280	201,586,400	28.3%
Service Population (B)	11,267,700	14,359,660	27.4%
Boundary VMT per Service Population (A/B = C)	13.9	14.0	0.7%

Notes:

1. Boundary VMT for local streets (including centroid connectors) and freeways within the City of Cupertino.
2. Boundary VMT for local streets (including centroid connectors) and freeways within Santa Clara County.
3. Boundary VMT for local streets (including centroid connectors) and freeways within the Bay Area region.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.
6. Percent change is between 2015 and 2040.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Boundary VMT is a VMT metric that measures the VMT on the jurisdictions roadway system. The boundary VMT on local streets and freeways is expected to grow at a slower rate than the Cupertino service population, which means that the City of Cupertino's boundary VMT per service population is expected to decrease over time. The Santa Clara County boundary VMT rate is also decreasing, but the Bay Area region boundary VMT rate is slightly increasing.

The 15.5 percent increase in the boundary VMT within the City of Cupertino is nearly three times the amount of boundary VMT growth implied per the state goals. As shown in the image below from the statewide VMT scenario prepared by CARB, VMT can grow by 6.5% in California and still achieve its GHG emissions goals.[26] If the City were to establish its VMT thresholds consistent with state policies, the long-term expectation would be that boundary VMT on City streets and freeways would increase by no more than 6.5% as shown in **Figure 3** below. It is important to note that only about one-third of the boundary VMT that occurs within the City of Cupertino is associated with Cupertino land uses (see **Appendix F** for more details). Part of the reason for this is the large amount of through traffic that uses the two freeways and the major arterials of De Anza Boulevard and Stevens Creek Boulevard that pass through the city. A limitation of using boundary VMT as a threshold in Cupertino is that the majority of the boundary VMT in Cupertino is associated with pass through traffic, and thus is not directly influenced by planning or land use decisions within Cupertino.

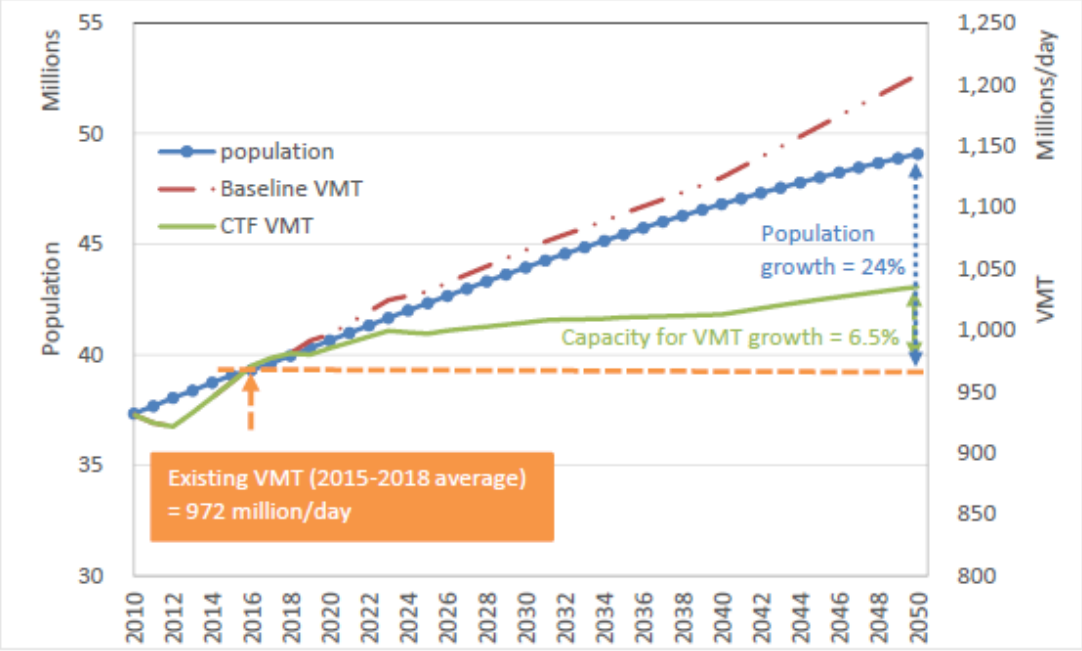


Figure 3: California Total Project Population Growth and VMT Growth

[26] California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (January 2019).

With the CARB information in-mind the following thresholds are options:

- Set a Threshold Based on State Goals:
    - Up to a 6.5 percent increase in boundary VMT on City streets and regional freeways within the City of Cupertino.[27]
- Set a Threshold Consistent with Existing General Plan
    - X% reduction in boundary VMT on City streets and freeways within to achieve long-term General Plan goals for GHG emissions, air quality, and energy conservation.[28]

[27] This VMT threshold is consistent with the recent CARB publications that have identified that new land use projects could contribute to these statewide goals by achieving total project generated VMT levels of at least 14.3% below the existing baseline. For light-duty vehicles only, CARB cites a 16.8% reduction below baseline (2018) average VMT.

[28] To calculate this value requires estimates of Citywide GHG emissions, air quality emissions, and energy consumption to determine the VMT budget that would achieve long-term emissions expectations. Alternatively, the threshold could be established if the City choose a boundary VMT threshold of 0% to 6.5% increase in boundary VMT on the streets and freeways within the City's geographic boundary.

Chapter 6. VMT Mitigation Actions

Lead agencies making the transition to VMT are realizing the challenges of trying to mitigate VMT on a project-by-project basis. Much of this difficulty arises from the regional nature of VMT impacts, as well as the complexity of underlying factors influencing VMT generation.

Existing Programs

For large area plans such as general plans and specific plans, mitigation will typically focus on physical design elements related to the ultimate built environment, such as the density and mix of land uses as well as the availability and quality of the transportation network related to transit, walking, and bicycling.

For individual development projects, the primary methods of mitigating a VMT impact are to either:

1. change the project in a way that reduces VMT; or
2. implement a program designed to reduce VMT, such as a Transportation Demand Management (TDM) program.

The available research indicates that the effectiveness of TDM measures varies substantially depending on the context in which they are applied. TDM is most effective in urban areas where urban character (land use and built environment) and land use mix are most supportive of vehicle trip reduction. TDM programs are less effective in rural and suburban areas where the built environment and transportation network are more dispersed and where modes are typically limited to personal vehicles.

The current standard for calculating VMT reduction efficacy from TDM strategies is the California Air Pollution Control Officer Association (CAPCOA) 2010 report, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA report). This resource evaluates the literature behind a number of TDM program elements, and provides methods for calculating a VMT reduction associated with each. There are several limitations in the available VMT reduction data for suburban and rural application that are worth noting here:

- **There is little to no evidence regarding the efficacy of TDM programs in rural areas.** For much of the hilly portion in and near Stevens Canyon in Cupertino, there may not be applicable programs with the level of evidence required to conclude that an impact can be reduced to less-than-significant levels.
- **Suburban areas have only moderate TDM options available for non-office land uses.** Overall, CAPCOA indicates that projects in suburban areas may be able to achieve up to a 15% reduction in VMT. However, achieving this level of reduction requires that the project either meet certain land use diversity and/or densities or adopt parking pricing, parking supply limits, or transit expansions—all of which may have a high financial or political cost.

- **Effectiveness of VMT reduction may diminish with each additional TDM strategy implemented.** Each of the CAPCOA TDM strategies can be combined with others to increase the effectiveness of VMT mitigation; however, the interaction between the various strategies is complex and sometimes counterintuitive. Generally, with each additional measure implemented, a VMT reduction is achieved, but the incremental benefit of VMT reduction may diminish.
- **TDM program effectiveness is highly dependent on individual tenants.** For office or retail TDM programs, the level of commitment by individual tenants determines the level of success. For most projects, the tenants will be unknown at the time of environmental review, and tenants can change frequently over the life of the building; this makes it more difficult to forecast TDM reductions.
- **TDM program implementation requires ongoing monitoring.** If used as a mitigation measure, TDM programs will require ongoing monitoring for compliance. This may require additional staff time on the part of the lead agency.

Due to the above considerations, it may be prudent to indicate that TDM programs may be used as project mitigation, but that they cannot on their own reduce a transportation impact to a less-than-significant level, unless stringent monitoring requirements are adopted as part of the mitigation.

What VMT Reduction Mitigation Strategies are Feasible in Cupertino?

The effectiveness of different TDM strategies varies widely based on local context, scale of intervention, and availability of non-automotive transportation. TDM strategies are most effective when implemented in a policy environment that encourages land use location efficiency and infrastructure investments that support transit, walking, and bicycling. Measures that more typically come to mind when considering TDM, such as building-specific subsidy and marketing programs for transit or other non-drive-alone modes, or installation of bicycle racks, tend to be less effective than community-wide strategies and investments. Furthermore, programs tied to individual projects or buildings may vary in efficacy based solely on the final building tenants. **Figure 4** presents a conceptual illustration of the relative importance of scale.

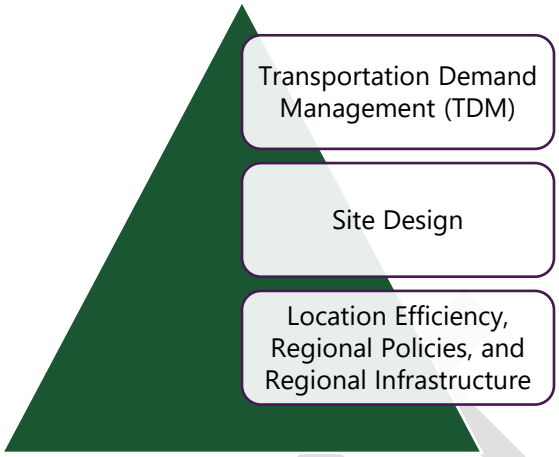


Figure 4: Transportation-Related GHG Reduction Measures

Of the 50 transportation measures presented in the CAPCOA report, 41 are applicable at building and site level (see **Appendix G** for more information). Building and site-based strategies are typically more easily included as mitigations for individual projects, as the project sponsor has a greater amount of control over the specific implementation and outcomes. The remaining nine CAPCOA strategies are functions of, or depend on, site location and/or actions by local and regional agencies or funders. **Table 9** summarizes the strategies according to the scope of implementation and the agents who would implement them.

Table 9: Summary of Transportation Related CAPCOA Measures

Scope	Agents	CAPCOA Strategies
Transportation Demand Management (TDM)	Employer, Manager	**26 total** from five CAPCOA strategy groups: • **3** from 3.2 Site Enhancements group • **3** from 3.3 Parking Pricing Availability group • **15** from 3.4 Commute Trip Reduction group • **2** from 3.5 Transit Access group • **3** from 3.7 Vehicle Operations group
Site Design	Owner, Architect	**15 total** from three strategy groups: • **6** from 3.1 Land Use group • **6** from 3.2 Site Enhancements group • **1** from 3.3 Parking group • **2** from 3.6 Road Access group
Location Efficiency, Regional Policies, and Regional Infrastructure	Developer, Regional and Local Agencies	**6 total** from 3.1 Land Use group

Note: Disruptive trends, including but not limited to, transportation network companies (TNCs), autonomous vehicles (AVs), internet shopping, and microtransit may affect the future effectiveness of these strategies.
Source: Fehr & Peers, 2020

Of these strategies, we have identified 15 that would be appropriate and potentially effective in Cupertino. The following list of strategies were identified for more detailed review based on how the land use context, and potential land use changes, in Cupertino could influence each strategy's effectiveness.

Transportation Demand Management (TDM)

1. **Employ marketing and encouragement strategies to promote non-drive-alone travel:** This strategy encompasses the aspects of typical TDM programs that rely on providing information and incentives to individuals interested in changing their commute patterns. Examples include providing transit schedules or trip planning assistance, hosting promotional events such as a bike to work day, or leading contests or challenges for changing travel behavior. This process is usually undertaken by employers, but some jurisdictions form public agencies or private associations that can facilitate promotions between multiple different employers.
2. **Encourage telecommuting and alternative work schedules:** This strategy relies on effective internet access and speeds to individual project sites/buildings to provide the opportunity for telecommuting. The effectiveness of the strategy depends on the ultimate building tenants and this should be a factor in considering the potential VMT reduction.
3. **Provide ride-sharing programs:** This strategy focuses on encouraging carpooling and vanpooling by project site/building tenants and has similar limitations to strategy (2) above.
4. **Require employer-based shuttle or transit service:** This strategy involves working with individual employers or building managers to offer shuttle services. For large employers with corporate campuses, this may include running private shuttles to and from neighborhoods where employees live. For smaller employers, or buildings with multiple employer tenants, it may involve a shuttle connecting to regional transit, such as a Caltrain station, funded through an organization such as a Transportation Management Association (TMA).

Site Design

5. **Provide pedestrian network improvements:** This strategy focuses on creating a pedestrian network within new projects and connecting to nearby destinations. Projects in Cupertino tend to be smaller, so the emphasis of this strategy would likely be the construction of network improvements that connect the project site directly to nearby destinations. Alternatively, implementation could occur through an impact fee program or benefit/assessment district based on regional or local plans.
6. **Provide traffic calming measures and low-stress bicycle network improvements:** This strategy combines the CAPCOA research focused on traffic calming with new research on providing a low-stress bicycle network. Traffic calming creates networks with low vehicle speeds and volumes that are more conducive to walking and bicycling. Building a low-stress bicycle network produces a similar outcome. Implementation options are similar to strategy (5) above. One potential change in this strategy over time is that e-bikes (and e-scooters) could extend the effective range of travel on the bicycle network, which could enhance the effectiveness of this strategy.

7. **Implement car-sharing program:** This strategy reduces the need to own a vehicle or reduces the number of vehicles owned by a household by making it convenient to access a shared vehicle for those trips where vehicle use is essential. Examples include programs such as ZipCar, Car2Go, and Gig.
8. **Limit parking supply:** When combined with companion TDM measures, reduced parking supply discourages driving by limiting easy and convenient parking options. Implementation of this strategy may require reducing (or removing) minimum parking requirements and allowing developers to use shared parking strategies.
9. **Unbundle parking costs:** Unbundling separates parking costs from property cost, for instance by not including a parking space in a residential unit's rent, or by requiring employers to lease each parking space separately from the building owner. This strategy ensures that the user understands that the cost of driving includes parking and can encourage people to use an alternative mode to save money.
10. **Implement on-street market pricing for parking:** This strategy focuses on implementing a pricing strategy for parking by pricing all on-street parking in central business districts, employment centers, and retail centers. Priced parking would encourage "park once" behavior and may also result in area-wide mode shifts.

Location Efficiency, Regional Policies, and Regional Infrastructure

11. **Increase density of land uses:** This strategy focuses on increasing density of land uses, where allowed by the General Plan and/or Zoning Ordinance, to reduce distances people travel and provide more travel mode options. This strategy also provides a foundation for many other strategies. For example, densification makes it more efficient to operate increased transit services.
12. **Increase diversity of land uses:** This strategy focuses on inclusion of mixed uses within projects or in consideration of the surrounding area to minimize vehicle travel in terms of both the number of trips and the length of those trips.
13. **Increase transit accessibility:** This strategy focuses on encouraging the use of transit by locating a project with high density near transit. A project with a residential/commercial center designed around a transit hub is referred to as a transit-oriented development (TOD).
14. **Integrate affordable and below market rate (BMR) housing:** This strategy provides greater opportunities for lower-income families to live closer to job centers, which makes transit a more feasible commute mode, and also reduces the distance between workplaces and homes.
15. **Increase transit service frequency and speed:** This strategy focuses on improving transit service convenience and travel time competitiveness with driving. Given existing land use density in Cupertino, this strategy may be limited to traditional commuter transit where trips can be pooled at the start and end locations, or it may require new forms of demand-responsive transit service. A demand-responsive service could be provided as subsidized trips by contracting to private TNCs or taxi companies. Alternatively, a public transit operator could provide the subsidized service but would need to improve on traditional cost effectiveness. Note that implementation of this strategy would require regional or local agency

implementation, substantial changes to current transit practices, and would not likely be applicable for individual development projects.

The 15 strategies listed above are those that may be most appropriate for the greatest range of projects in Cupertino, based on the existing land use context and vision set forth in the General Plan. However, in suburban environments, CAPCOA indicates that the maximum reasonable VMT reduction from all TDM measures combined will likely not exceed 15%. This research does not necessarily reflect the nature of employer shuttle and TDM programs in 21st Century Silicon Valley; however, it does present a general assessment of total VMT reduction potential for most development projects. Communities are also exploring the use of Transportation Management Associations for the City or sub-region (e.g., several city's) to provide community shuttle services and TDM strategies to benefit existing and future residents and employees.

New VMT Mitigation Concepts

Today Cupertino connects land development projects to transportation network improvements using a transportation fee and the Congestion Management Program (CMP). The transportation impact fee program collects a fair-share fee payment from new development to contribute to the cost of a capital improvement program (CIP) consisting of long-term transportation projects that facilitate vehicle travel as the residential population and employment population increases. The CMP is designed to monitor traffic congestion and transit performance while implementing strategies that manage traffic congestion and its impacts on air quality. Cupertino does include some TDM requirements for projects deemed to affect the CMP network; those projects must prepare a TDM plan meeting certain specifications to help reduce the number of vehicle trips.

While the City transportation impact fee does include some public transit and bicycle improvements, in order for the fee to be used as a VMT mitigation program the City would need to demonstrate that implementation of the complete set of improvements in the fee program would result in a specific numerical VMT reduction. The current focus of both the impact fee and the CMP is to expand roadway capacity to address vehicle LOS deficiencies. This strategy may have the result of inducing new vehicle travel that, in the long run, would generate new VMT and emissions. Refer to the following websites for more research information and technical details.

- https://ncst.ucdavis.edu/events/webinar-new-web-tool-calculate-induced-travel
- https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf
- https://trrjournalonline.trb.org/doi/abs/10.3141/2653-02

Managing and reducing demand could accomplish the CMP goal, especially by focusing on reducing peak period VMT. The main source of congestion as defined by the CMP is that vehicles move too slowly (i.e., peak period speeds are lower than posted speed limits). This definition of congestion describes a symptom and fails to recognize that peak period travel consists of vehicles with poor seat utilization caused by not managing demand more effectively and mispricing travel. The existing roadway network in Cupertino has a limited capacity and this capacity is routinely filled up during peak periods by vehicles

with solo drivers (i.e., low seat utilization). Further, limited facilities exist that prioritize travel by high occupancy vehicles. Increasing vehicle speeds and substantially reducing delays requires much greater seat utilization in existing vehicles (i.e., private vehicles and public transit). This change would also reduce VMT. Hence, refocusing the CMP on the combination of congestion management and VMT reduction would result in a different CIP, which could qualify as VMT impact mitigation.

Four possible mitigation approaches are described in the following sections:

- VMT Cap
- VMT Based Impact Fee Program
- VMT Mitigation Bank
- VMT Mitigation Exchange

A VMT Cap can be developed and administered on a project-by-project basis, while the remaining three options (VMT Based Impact Fee Program, VMT Mitigation Bank, and VMT Mitigation Exchange) are broader programmatic approaches to impact mitigation. The concept of a 'program' approach to impact mitigation is commonly used in a variety of technical subjects including transportation, air quality, greenhouse gases, and habitat. Absent new program-level VMT mitigation approaches, rural and suburban lead agencies will have limited feasible mitigation options for project sites. Without feasible mitigation, significant VMT impacts would be significant and unavoidable (SAU). Under these circumstances a project must prepare an environmental impact report (EIR), thus adding time and cost to environmental review compared to an initial study/negative declaration (IS/ND). Program-based approaches may be able to overcome the limitation of project-site only mitigation. Additional details about VMT fees, VMT banks, and VMT exchanges, including implementation flow charts, are provided in **Appendix G**.

VMT Cap

A VMT cap is a project-specific limit on total project generated VMT. Often a VMT cap is linked to the jurisdiction's citywide air quality, GHG reduction, and energy conservation goals. VMT estimates are not directly observed – they must be estimated using big data sources, a travel survey, zip code data of residents, employees, customers, or visitors, and/or a travel model. Like a vehicle trip cap, VMT caps often require a project applicant to implement a TDM program with monitoring and reporting standards. A VMT cap may also include specific consequences or penalties if the project fails to comply.

VMT Based Impact Fee Program

Although establishing any impact fee program is time consuming, it is a common and well-understood process governed by the Mitigation Fee Act. Using a VMT reduction goal linked to the agency's SB743 thresholds to establish the nexus would result in a capital improvement program (CIP) consisting mostly of transit, bicycle, and pedestrian projects. These types of fee programs are recognized as an acceptable form of CEQA mitigation if they can demonstrate that the CIP projects will be fully funded and implemented.

VMT Mitigation Exchange

A VMT Mitigation Exchange concept relies on a developer agreeing to implement a predetermined VMT-reducing project or proposing a new one, which could be located elsewhere in the community or possibly outside the community. The Exchange needs to have a facilitating entity that can match the VMT generator (the development project) with a VMT-reducing project or action. The facilitating entity could be the lead agency or another entity that has the ability to provide the match and to ensure through substantial evidence that the VMT reduction is valid. A key unknown with this approach is the time period for the VMT reduction. For example, how many years of VMT reduction would be required to declare a VMT impact less than significant?

VMT Mitigation Banks

A VMT Mitigation Bank attempts to create a monetary value for VMT reduction, such that a developer could purchase VMT reduction credits. The money exchanged for credits could be applied to local, regional, or state level VMT reduction projects or actions. Like all VMT mitigation, substantial evidence would be necessary to demonstrate that the projects covered by the Bank would achieve expected VMT reductions and some form of monitoring may be required. This is more complicated than a VMT Mitigation Exchange and would require more time and effort to set up and implement. The verification of how much VMT reduction is associated with each dollar or credit would be one of the more difficult parts of the program.

Summary of Mitigation Action Options

Table 10 presents the three groups of VMT mitigation actions discussed above, and presents the potential reduction from utilizing strategies in each group. Individual VMT strategies range widely in effectiveness, as discussed above; therefore, **Table 10** summarizes an approximate range of VMT reductions by strategy group.

Table 10: Summary of VMT Mitigation Action Options

Scope	VMT Reduction Ranges	
	Low[1]	High[2]
Transportation Demand Management (TDM)	2%	25%
Site Design	3%	10%
Location Efficiency, Regional Policies, and Regional Infrastructure	10%	60%

Notes:

1. "Low/Typical" indicates a conservative estimate that is highly defensible and suitable for use in environmental analysis documents, or to mitigate a VMT impact. Not all strategies provide a quantifiable reduction suitable for EIR/EIS use.
2. "High/Ambitious" indicates a potential upper limit to reductions, and requires a very high level of investment in most cases.
3. Please note that disruptive trends, including but not limited to, transportation network companies (TNCs), autonomous vehicles (AVs), internet shopping, and microtransit may affect the future effectiveness of these strategies.

Source: Fehr & Peers, 2020

Overall, CAPCOA indicates that projects in suburban areas may be able to achieve up to a 15% reduction in VMT. However, achieving this level of reduction requires that the project implement many individual project-level strategies (such as TDM and site design strategies) *and* be sited in an efficient, transit-adjacent location. These traits may not be feasible for many future projects in Cupertino. In addition, project-level TDM strategies are often implemented by individual building tenants (i.e., employers), so their use requires ongoing monitoring and adjusting to account for changes in tenants and their travel behavior.

Due to these project-specific implementation barriers, ad-hoc project-by-project mitigation is less effective for reducing VMT compared with larger scale program-based approaches, such as an impact fee program that funds transit expansion, or land use and zoning changes at a citywide level. The emergence of these new mitigation concepts presents opportunities to reduce VMT at a citywide or regional scale, though the measured effects of these programs (and their ability to reach desired long-term land use outcomes) are largely unknown.

Options, Limitations, and Considerations: VMT Mitigation Actions

Common Options

Menu of built environment and transportation demand management (TDM) mitigation strategies contained in Quantifying Greenhouse Gas Mitigation Strategies, CAPCOA, 2010.

Common Limitations

Built environment strategies require modifying the project, which may create inconsistencies with the project description and financial feasibility. TDM strategies are often building-tenant-dependent, so their use requires ongoing monitoring and adjusting to account for changes in build tenants and their travel behavior.

Ad-hoc project-by-project mitigation is less effective for reducing VMT than larger scale program-based approaches, such as an impact fee program.

Considerations

Develop a VMT mitigation program using any of the following approaches:

1. Impact fee program based on a VMT reduction nexus.
2. In-lieu fee program for VMT reducing actions.
3. VMT mitigation bank or exchange program.
4. TDM ordinance applying to all employers.

City of Cupertino Initial Recommendations: VMT Mitigation Strategies

For discussion during City Council Study Session.
Apply VMT reduction measures as Transportation Demand Management (TDM) with a Transportation Management Association (TMA), site design, and regional policies (location efficiency, regional policies, and regional infrastructure) to reduce VMT on Cupertino streets. In the long-term, consider emerging VMT mitigation options such as a VMT cap, VMT fee, VMT bank, and/or VMT exchange.

Chapter 7. Multimodal Performance Measures

With the passage of SB 743, level of service (LOS) may no longer be used as a criterion to identify significant impacts according to California Environmental Quality Act (CEQA) and vehicle miles traveled would be used in its place to identify environmental impacts. Practically, this means that the City of Cupertino will have a CEQA-specific performance measure (VMT) to identify potential significant impacts and mitigation as a part of the environmental analysis process, and updated multimodal analysis methods for non-CEQA analysis. Using the existing City policies on transportation as a guide, this chapter discusses the state of multimodal analysis, how current multimodal analysis methods might apply in Cupertino, Cupertino's current multimodal analysis approach, and next steps to adopt a multimodal analysis.

State of Practice for Multimodal Analysis

With this focus on a balanced transportation analysis and using VMT for CEQA impact analysis, Cupertino may want to modify how it evaluates the effects on the transportation system by individual development and transportation projects for its non-CEQA analysis. Implementation of multimodal analysis techniques is still evolving, and there is no single approach that has been widely adopted within the industry or local communities. However, there are a number of approaches that provide the City with options for various modes and levels of quantitative analysis. In addition, many of these methods move away from strictly quantitative approaches and address considerations such as user experience and relative priority between transportation options.

Multimodal Analysis Methods

To understand the range of available options, we have prepared a summary of available Multimodal Analysis methods. The most appropriate method(s) for a local community depends on unique situations related to the mode of evaluation (e.g., auto, transit, bike, etc.) and setting (e.g., urban, suburban, rural). These methods vary in data needs and complexity. The methods are briefly described below.

- **Tiered Level of Service Policy** – A tiered level of service (LOS) standard uses standard vehicle LOS metrics but applies different standards depending on the context of the transportation system and adjacent land uses. Often a more rigorous standard will be applied in residential neighborhoods to prioritize relatively low traffic volumes, while a more lenient standard will be applied in downtowns or active commercial areas to allow for slower travel speeds, higher traffic volumes, and encouragement of transit and active modes. This tiered LOS approach is used in cities such as Morgan Hill, Redwood City, Mountain View, and San Jose.
- **HCM 2010 MMLOS** – The *2010 Highway Capacity Manual* (HCM 2010) provides detailed instruction on calculating LOS for pedestrians and bicycles on urban streets (at the link and segment levels) and at signalized and two-way stop intersections. Pedestrian and bicycle LOS are

integrated into HCM 2010's multimodal LOS, allowing analysts to compare trade-offs between modes; however, this approach is not sensitive to the local context and only considers variables within the right-of-way. Transit LOS is calculated at the segment and facility level for public transit systems operating within the roadway network.

- **Person Delay** – Simulation models can be used to measure system performance in terms of overall person-delay for all modes within a transportation network. This method provides a better decision-making tool for developing improvements to promote efficient movement of people, rather than a particular type of vehicle. It also facilitates the development of multimodal mitigation measures. It is useful in analyzing higher occupancy travel modes such as bus rapid transit (BRT) or the influence of a grade-separated crossing, as it accounts for benefits and impacts to all facility users.
- **Built Environment Factors** – The built environment is generally understood to have a strong influence on transportation choices and the quality of service for difference modes. While the built environment includes both land use and transportation infrastructure, most LOS applications focus on the latter, identifying elements of the built environment that fall within the public right-of-way and under public control. At the heart of this approach is the question, "To what extent do roadway features that include pedestrian and bicycle friendly designs impact a traveler's perception of that facility?"
- **Layered Networks/Street Types** (Similar performance measure used in Cupertino's General Plan Mobility Element to create the street typology and circulation network, but with a description of mode preference) – This approach, which is suitable for General Plan-level analysis, designates modal emphasis by street to create a complete streets network. Layered networks recognize that while all traveler types need to be accommodated within a community, no single street can accommodate all transportation users at all times. The layered network concept envisions streets as systems, with each street type designed to create a high-quality experience for its intended users. A layered network approach can also use context-sensitive land use and mode overlays to enhance additional transportation modes.
- **Pedestrian/Bicycle Environmental Quality Indices (PEQI/BEQI)** – The San Francisco Department of Public Health (SFDPH) developed the Pedestrian Environmental Quality Index (PEQI) and Bicycle Environmental Quality Index (BEQI) to measure the impacts of built environment on the pedestrian and bicycle environmental quality, activity, and safety. The PEQI and BEQI were developed in consultation with transportation professionals and travel behavior researchers.
- **Automobile Trips Generated (ATG)** – Some jurisdictions, including San Francisco, Paso Robles, and Emeryville, have pursued an approach to system evaluation that is based on automobile trips generated (ATG). The premise is that instead of evaluating transportation impacts on a case by case basis, applicants pay a transportation fee proportional to the number of new automobile trips generated, which in turn funds transportation improvements on a local scale for all travel modes.
- **Level of Traffic Stress** (Similar performance measure used in Cupertino's Bicycle Transportation Plan) – The Level of Traffic Stress (LTS) method evaluates bicycle Quality of Service (QOS) by

measuring *low-stress connectivity*, defined as "the ability of a network to connect traveler origins to their destinations without subjecting them to unacceptably stressful links." Based on Dutch standards for bicycle facility design, the method classifies bicycle facilities on a scale from one to four. Better scores are assigned to facilities with low exposure to auto traffic and easy crossings at intersections, indicating low-stress environments which are attractive to many types of cyclists.

Local communities and the Florida Department of Transportation have adapted multimodal methods for local application within their communities, which include the following:

- **Charlotte, North Carolina** – In 2007, the City of Charlotte, North Carolina developed a method to assess street design features that impact pedestrians and bicyclist crossing signalized intersections. This method can be used as a tool to assess and improve pedestrian and bicycle levels of comfort and safety through intersection design features. The results can be compared with those for motor vehicle LOS of an intersection and weighed according to user priorities.
- **Fort Collins, Colorado** – Fort Collins created MMLOS standards for its streets in the late 1990s and has continued to refine them. Fort Collins standards consider both route characteristics; high priority land uses, such as public schools, that require a higher LOS for pedestrian and bicycle modes. The City prioritizes connectivity in its Bicycle Plan and Pedestrian Plan in order to eventually create a fully connected grid of bike and pedestrian facilities.
- **Florida Department of Transportation (FDOT)** – Florida DOT (FDOT) developed a multimodal evaluation tool in 2009 based on the *2000 Highway Capacity Manual, Transit Capacity, and Quality of Service Manual*, and the Landis Bicycle and Pedestrian LOS Models. The tool allows for two levels of analysis: generalized planning, appropriate for broad applications such as a statewide or regional and long-range estimates, and preliminary engineering, appropriate for facility designs and alternatives analysis at the project level.

The VTA TIA Guidelines identify many of the above-listed multimodal performance measures for potential use in a transportation analysis in Santa Clara County. The list of multimodal performance measures is continually evolving, and in some cases groups of measures are used to evaluate a transportation project. Examples include the STARS tool and the Caltrans Smart Mobility Framework, described below.

- **Sustainable Transportation Analysis and Rating System (STARS)** – The Santa Cruz County Regional Transportation Commission prepared the *2014 Santa Cruz County Regional Transportation Plan* using the STARS tool to select and prioritize the projects in the constrained project list. The STARS tool is a voluntary transportation project planning and evaluation tool similar to Leadership in Energy and Environmental Design (LEED) for building projects. Performance measures address goal and policy topics such as access and mobility, health, safety, equity, economic benefit, cost effectiveness, climate and energy, and ecological function.
- **Smart Mobility Framework** – The *Smart Mobility Framework* report creates guidelines for Caltrans and other State of California agencies to use when planning improvements to the state, regional, and local transportation systems in a manner that integrates land use and transportation decisions and responds to the State's economic, equity, and environmental goals, including benefits to climate change and other sustainability concerns. This system of performance

measures is correlated with a system of land use "place types" to describe the full range of contexts and policy objectives throughout California. Innovative performance measures include location efficiency, reliable multimodal mobility, public health and safety (including speed suitability), climate and energy conservation, social equity, and sustainable economy (including effects on productivity, system resources, performance optimization, and return on investment).

Multimodal Analysis Applications to Cupertino

The remainder of this section discusses the general considerations that the City should include in its decision on what form of multimodal analysis techniques it uses for evaluating project specific impacts on the transportation system.

Methods and Modes Evaluated

Table 11 summarizes which modes of travel can be evaluated with each of the multimodal analysis methods. Three of the methods focus solely on the pedestrian and bicycle travel modes, and one focuses solely on bicycle travel. The other five methods include procedures for analyzing pedestrian, bicycle, transit, and auto modes. Two of the methods can also be applied to trucks access within the community.

Table 11: Multimodal Analysis Methods – Modes Analyzed

Method	Pedestrian	Bicycle	Transit	Auto	Trucks
Tiered Level of Service Policy	✓	✓	✓	✓	
HCM 2010 MMLOS	✓	✓	✓	✓	
Person Delay	✓	✓	✓	✓	✓
Built Environment Factors	✓	✓			
Layered Networks/Street Types	✓	✓	✓	✓	✓
PEQI/BEQI	✓	✓			
Automobile Trip Generation	✓	✓	✓	✓	
Level of Traffic Stress		✓			
Charlotte, North Carolina	✓	✓			
Fort Collins, Colorado	✓	✓	✓	✓	
Florida Department of Transportation	✓	✓	✓	✓	

Source: Fehr & Peers 2020.

Evaluation Approach: Computational, Checklist, or Combination

Implementation of SB 743 and the Cupertino General Plan puts a greater priority on walking, biking, and transit, which means a multimodal analysis will need to address key questions, including the following:

- Is this an enjoyable place to walk or bicycle?
- Is transit convenient?
- How are tradeoffs between modes considered in transportation improvements?

Among others, answering these questions can take one or more forms of computational analyses, qualitative checklists, or a combination of analysis and checklist:

- Computational
    - Tiered Level of Service
    - HCM 2010 MMLOS
    - Person Delay
    - Automobile Trip Generation
    - Level of Traffic Stress
    - Florida DOT
- Checklist
    - Charlotte, North Carolina
    - Built Environment Factors
    - Layered Networks/Street Types
- Combinations
    - PEQI/BEQI
    - Fort Collins, Colorado

Because the current state of the practice does not define a single method, there remains the flexibility to adapt or modify techniques from each category that will address the specific needs of the City. Further, each of these techniques requires different levels of data in its application. The computational approaches require a substantial amount of data as compared to the checklist approaches. Therefore, the level and amount of data required should be a key consideration in which analysis techniques the City chooses to implement, in order to balance between addressing the policy requirements and the cost to evaluate individual projects.

Cupertino's Current Multimodal Analysis Approach: Circulation Network and Vehicle Level of Service

In order to create a balanced transportation system, the Cupertino General Plan has prepared a Circulation Network with a street typology that defines the current modes for each street type. The street typology has nine street types: freeway, expressway, boulevard (arterial functional classification), main street, avenue (major and minor collector functional classification), neighborhood connector, residential street, regional pedestrian/bike pathway, and local pedestrian/bike pathway. Each street type plays a key role in how people travel. Many of the street types defined in the General Plan seek to balance all modes of transportation on the same street. Trying to serve competing modes equally on individual streets sometimes fails to result in first-rate facilities for either.

In addition to the circulation network defined in the General Plan, the Mobility Element of the *Cupertino General Plan* uses level of service (LOS) to measure traffic operations to maintain consistency between land use and transportation within the city's jurisdiction. Specifically, Policy M-1.2 states:

> *Policy M-1.2: Transportation Impact Analysis: Participate in the development of new multi-modal analysis methods and impact thresholds as required by Senate Bill 743. However, until such impact thresholds are developed, continue to optimize mobility for all modes of transportation while striving to maintain the following intersection Levels of Service (LOS) at a.m. and p.m. peak traffic hours:*
>
> - *Major intersections: LOS D*
> - *Stevens Creek Boulevard and De Anza Boulevard: LOS E+*
> - *Stevens Creek Boulevard and Stelling Road: LOS E+*
> - *De Anza Boulevard and Bollinger Road: LOS E+*

The use of vehicle LOS method only considers automobile delay and is insensitive to walking, bicycling, and transit conditions. Traditional vehicle LOS analysis actually considers bicycles and pedestrians as an impediment. As a result, only performing a traditional vehicle LOS analysis, while appropriate at times, can also have unintended consequences to other travel modes and often leads to overbuilt vehicle infrastructure. For example, changing signal timing to reduce automobile delay can affect pedestrian accessibility by increasing the waiting time for pedestrians crossing the street. Because of the drawbacks of traditional vehicle LOS analysis, new goals and policies are being adopted in some jurisdictions to evaluate all modes of transportation when preparing a citywide transportation system and assessing the effects of development or transportation projects.

Next Steps

Below is a summary of key components that could serve as a new Citywide Multimodal Transportation System with a combination of system-wide and multimodal performance measures. This is a comprehensive transportation planning approach that builds on the Cupertino General Plan, with

potential benefits including CEQA streamlining, balanced transportation system planning, and enhanced community benefits.

Planning a Citywide Multimodal Transportation System

As the City implements SB 743, it may update its General Plan multimodal transportation policies and will continue to monitor and manage traffic operations along streets and intersections as individual development occurs to ensure that the street system is optimized for steady, safe, and orderly traffic flow operations and is balanced for each mode of travel. Next steps toward implementation of a citywide balanced transportation system addressing both CEQA and non-CEQA aspects of a transportation analysis may include the following City actions:

1. **Develop a CEQA Analysis Approach**: The City of Cupertino would adopt, by resolution, baseline and cumulative VMT thresholds to be used for land use projects, land use plans, and transportation projects. Because there is not yet a scientific way to define good VMT and bad VMT directly, the VMT threshold would be based on how Cupertino values its long-term expectations for air quality and greenhouse gas expectations. If the City establishes a citywide cumulative VMT threshold, it could take advantage of the potential CEQA streamlining and be a helpful metric to evaluate cumulative future conditions. The City will also need to develop its VMT mitigation approach.
2. **Develop a Non-CEQA Analysis Approach**: As it considers its preferred multimodal approach, the City may consider implementing the Layered Networks approach that builds upon Complete Streets principles and state level regulations and requirements[29] by providing modal preferences for each street type while ensuring that all modes are addressed in the larger system of streets. A Layered Network prioritizes certain modes on certain streets, providing continuity for the chosen mode while accommodating other modes or encouraging use on parallel networks. Providing selected treatments for a prioritized mode on selected streets can improve efficiency for that particular mode while ensuring increased safety for all modes. A Layered Network plan is a guiding policy for multimodal transportation system investments by public and private entities to achieve a complete transportation system.

   To complement the layered network and VMT performance measures, the City would prepare a multimodal connectedness checklist of basic and enhanced design features associated with land use and transportation projects. This checklist could vary based on the street user priorities and may include a mixture of quantitative and qualitative performance measures described above. To address a spectrum of transportation and land use projects, a combination of a built environment checklist, tiered level of service policy, and person delay analysis would be beneficial.

[29] Assembly Bill 1358, also known as the California Complete Streets Act of 2008, requires cities and counties to include complete streets policies in their general plans. These policies address the safe accommodation of all users, including bicyclists, pedestrians, motorists, public transit vehicles and riders, children, the elderly, and the disabled. These policies can apply to new streets as well as the redesign of corridors.

a. Multimodal Connectedness Checklist: At a minimum, a transportation and/or land use project would be evaluated relative to basic and enhanced built environment factors near a project site (perhaps within a 10 to 20-minute walking/bicycling distance). The main idea is to evaluate activity centers and destinations around projects to ensure that walk times to necessary destinations are minimized and the walking experience is comfortable. This multimodal connectedness checklist would inventory existing pedestrian and bicycle facilities near the site and identify potential enhancements to achieve the desired Layered Network mode priority near the project site. Using geographic information systems, travel time for each mode (e.g., walking, bicycles, transit, and vehicles) between the project and surrounding land uses can be used to gauge the degree of accessibility for a project. The City desires to minimize travel time to necessary destinations while minimizing unnecessary vehicle travel.
b. Tiered Vehicle Level of Service and Person Delay: At hot-spot locations or corridors where vehicle congestion occurs, vehicle LOS may be used; however, careful consideration should be given to how this analysis is used, especially in transit priority corridor areas. Specifically, with a greater emphasis on transit and active modes, it is recommended other performance measures such as person delay be used to accurately evaluate the effects on the transportation system to more accurately evaluate the person mobility at a specific location.

In some locations of Cupertino, it may be possible to adopt a vehicle level of service policy of LOS E (with LOS F permissible at locations within transit priority areas and hot spot locations approved by the City Council). This tiered LOS policy could support City General Plan objectives, utilize the public investment to its full potential, and provide a quantitative performance metric to monitor system performance. However, the overall priority of the General Plan is focused on improving overall access and connectivity, enhancing the attractiveness of non-vehicular transportation modes, and reducing vehicle demand on the roadway network. Funding and constructing a system that is substantially underutilized most of the day and encourages higher vehicle speeds results in secondary effects that degrade the mobility for pedestrians and bicyclists (i.e., conflicts with the General Plan vision).

3. **Develop a Multimodal Impact Fee:** The expectations for a balanced transportation network should also reflect expectations of funding availability to build and maintain the transportation system. Identifying the mode preference for specific streets reflects the community values. The City could update its impact fee project list to include mostly pedestrian, bicycle, and transit capital improvements that help reduce VMT (rather than vehicle capacity improvements that focus on vehicle mobility). The project list would be tied to the multimodal connected checklist, which checks the attributes for each street and functional classification.
4. **Update Guidelines and Programs:** Update the appropriate City Design Criteria, and other existing documents to reflect the Layered network. These updates should reflect a Complete Streets approach where all modes of travel are routinely accommodated within the street system. Other policy guidance documents may need to be updated.

5. **Prepare Transportation Demand Management (TDM) Program:** To provide guidance and articulate expectations, a TDM program should be established by City staff including a TDM plan and incorporating requirements of SB 1339.[30] The purpose of the TDM program is to reduce vehicle trips and provide transportation options to achieve the City's vision to improve the environment and quality of life for residents and employees. Cupertino should encourage firms located within the City of Cupertino to use flexible work hours (flex-time) and other traffic demand management strategies to reduce traffic congestion during typical commute periods. To the extent possible, companies should also be encouraged to share parking facilities with other adjacent uses through easement agreements. The City should also encourage residential developers to design and build project elements that support TDM, such as car-share and bike-share facilities, neighborhood electric vehicle (NEV) operation, transit stop amenities, and neighborhood transportation centers. In areas where schools are in close proximity, such as near Monta Vista High School, school day start and end times should be considered for change and/or staggering.
6. **Prepare Transportation Impact Analysis (TIA) Guidelines**: Develop and adopt transportation impact analysis guidelines that specify the process by which impacts due to new developments are identified. These guidelines should include specific performance measures and thresholds for the identification of impacts and mitigation measures in accordance with the General Plan objectives, including person mobility, the reduction in VMT and the development of a balanced transportation network for all modes. Roadway widenings should be evaluated in the context of potential impacts to community character, convenience for non-auto modes, safety, and cost/benefit.
7. **Community Review**: This complement would involve the presentation of processes and methods for decision-makers and the public to provide comments. The presentation would be based on the project specific examples and include the data needs, information provided, and criteria used for determining impacts. These updates to the General Plan would also include environmental documentation and public input.
8. **Adoption of Multimodal Analysis Standards**: If the new techniques produce the desired results in terms of evaluating the transportation system, at a reasonable level of effort, the City could adopt a multimodal analysis procedure for project-level analysis.

[30] Senate Bill No. 1339 Commute benefit policies. (2011-2012)

Chapter 8. Additional Implementation Considerations

The previous chapters focus on the necessary policy decisions required for the City to be in compliance with SB 743. This chapter discusses some of the more practical effects and considerations of this statutory change, including the following: how communities can continue to use vehicular level of service in their planning processes, use of tiering, and how responsibilities of commenting agencies on other agencies' EIRs have not changed.

Retaining LOS and Other Performance Metrics

While SB 743 removes vehicle delay from the assessment of environmental concerns, it continues to allow lead agencies to set standards and acceptability thresholds for local roadways as part of their General Plans Circulation Elements. Should the City of Cupertino wish to retain vehicle LOS as an important part of its development review process, vehicle delay and traffic concerns would be addressed during the land use review of proposed project, for example with regard to General Plan consistency. From an environmental perspective, substantial evidence would need to be presented that shows how the use of LOS does not induce additional vehicle travel. Specifically, if the General Plan Circulation Element includes an LOS-based standard, the environmental analysis of the General Plan may find a significant impact to VMT, because such a standard would likely require roadway capacity improvements that increase total project generated VMT in the city. Because of these conflicts, it may be useful to focus on detailed VMT analysis for larger land use plans as a way of permitting additional streamlining for pursuant tiered environmental review efforts.

The Multimodal Performance Measures section (**Chapter 7**) ends with suggested next steps on how to adopt a new multimodal performance measure.

Projects Consistent with a Community Plan or Zoning

As discussed in **Appendix D**, another consideration in threshold setting is how to address cumulative VMT impacts and whether addressing them in the General Plan EIR is advantageous for streamlining the review of subsequent land use and transportation projects given CEQA relief available through *CEQA Statute & Guidelines* Section 15183. This section relieves a project of additional environmental review if the project-specific environmental impacts were adequately addressed in the General Plan EIR and the project is consistent with the General Plan (see the next page).

15183. PROJECTS CONSISTENT WITH A COMMUNITY PLAN OR ZONING

(a) CEQA mandates that projects which are consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. This streamlines the review of such projects and reduces the need to prepare repetitive environmental studies.

The use of Section 15183 also addresses cumulative impacts as acknowledged in Section 15130(e).

15130. DISCUSSION OF CUMULATIVE IMPACTS

(e) If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j).

For Cupertino, addressing transportation VMT impacts in the City General Plan EIR could be useful in understanding how VMT reduction should be balanced against other community values when it comes to setting new VMT impact thresholds for SB 743.

Reviewing Projects in Neighboring Jurisdictions

Many of the Cupertino roads serve vehicle traffic from neighboring jurisdictions, and it is expected that many new land use projects that add future traffic to the city's roads will be entitled in other jurisdictions. As a reviewing agency, Cupertino is concerned about how new trips from a neighboring jurisdiction will affect its transportation network. Historically, a neighboring lead agency would use the City's level of service policy to identify future operational problems on City of Cupertino roads, identify potential impacts and mitigation, and if possible, arrange for the project sponsor to pay a fair share toward future transportation improvements. Lead agencies are realizing that using VMT as a metric makes it difficult to identify location-specific impacts within its jurisdiction or in a neighboring jurisdiction. The concept of a 'program' approach to impact mitigation (as discussed in the previous chapter) can be an attractive solution. Under a program-based approach, development mitigation contributions could be pooled to pay for VMT reduction strategies that would not be feasible for individual projects to implement, and if the program is multi-jurisdictional (as VMT itself is), it could address VMT impacts in multiple jurisdictions.

As a commenting agency, the City of Cupertino will retain its right to review EIRs from neighboring jurisdictions for consistency, completeness, and accuracy, and may submit comments, which will be included in the lead agency's Response to Comments. Changes to CEQA statute also continue to require an EIR to review the potential environmental impacts of a project even if those impacts occur outside of the lead agency's jurisdiction. This applies to all EIR categories; as such, projects reviewed by neighboring communities would still be required to consider air quality, greenhouse gas emissions, shadows, historic resources, and all other CEQA sections for impacts. The City may comment on these determinations at any of the CEQA-designated review points.

Appendix A: Summary Matrix of Decisions, Options, and Recommendations

Attachment A: City of Cupertino SB743 Implementation: Summary of Decisions, Options, and Recommendations

Lead Agency Decisions	Common Options	Common Limitations	Considerations	City of Cupertino Initial Recommendations for SB 743 Implementation
What form of VMT metrics could be used?	1. Total Project Generated VMT 2. Total Project Generated VMT per Service Population[1] 3. Household generated VMT per Resident (requires an activity/tour-based travel forecasting model) 4. Home-Based VMT per Resident (a partial VMT estimate) 5. Home-Based Work VMT per Employee (a partial VMT estimate) 6. Project's Effect on VMT using Boundary VMT for a specific area	Metrics other than total project generated VMT and total project generated VMT per service population typically only represent partial VMT (i.e., some vehicle types and trip purposes are excluded in the models used to estimate VMT). This may be acceptable for screening purposes but not for a complete VMT impact analysis. Project-generated VMT metrics cannot capture how a project changes behavior of non-project residents or employees.	The expectations of a CEQA impact analysis to strive to provide a complete picture of the effects of a project on the environment are highlighted within the *CEQA Statue & Guidelines*. For lead agencies, VMT metrics and method should consider current practice for air quality, greenhouse gases, and energy consumption impact analysis. In general, VMT is used as an input for these other analyses and current practice is to produce VMT estimates and forecasts that comply with *CEQA Statue & Guidelines* expectations.	**VMT Metrics** Include the following so that all forms of VMT needed for screening and complete VMT analysis are available. 1. Total Project Generated VMT 2. Total Project Generated VMT per service population 3. Home-based VMT per resident 4. Home-based work VMT per employee 5. Boundary VMT for an appropriate area affected by the Project (needed for air quality, GHG, and energy analysis)
What methods are available to use in estimating and forecasting VMT?	1. Caltrans Statewide Travel Demand Model 2. Metropolitan Transportation Commission (MTC) Regional Travel Forecasting Model 3. VTA-C/CAG Bi-County Travel Forecasting Model 4. Non-model "Accounting Methods" such as sketch planning tool or spreadsheet[2]	Statewide and regional models have limited sensitivity and accuracy for local scale applications off the shelf. Regional and local models often truncate trips at model boundaries. Sketch and spreadsheet tools do not capture the 'project effect on VMT'.	Selection of an appropriate travel forecasting approach is an important step because the tool used to develop VMT thresholds must also be used to evaluate a project's direct and cumulative VMT impacts. Regional or local models should be calibrated and validated for local project-scale sensitivity/accuracy (including appending trip length data for trips with external trip ends) before using these models to analyze both 'project generated VMT' and 'project effect on VMT'.	**VMT Methods** Use the VTA-C/CAG Bi-County model to assess projects large enough that the model would be sensitive to their changes to the built environment (dynamic testing of the travel model should be used to determine the model sensitivity to different project sizes). Use the Santa Clara Countywide VMT Evaluation Tool for baseline VMT screening or locally valid non-model VMT methods for projects where the travel model is not sensitive to changes.

[1] Service population includes population plus employment and may include students or visitors; it is intended to include all independent variables used in estimating trips.
[2] Sketch planning tool or spreadsheet method has limitations if using a citywide or regional average for a threshold.

Lead Agency Decisions	Common Options	Common Limitations	Considerations	City of Cupertino Initial Recommendations for SB 743 Implementation
Is use of VMT impact screening desired?[3]	Projects that reduce VMT or are located within transit priority areas (TPAs) should be presumed to have a less than significant impact on VMT. Additional screening options identified in the OPR *Technical Advisory* for: 1. Map based screening for residential and office projects 2. Local-Serving Retail Projects 3. Transportation projects that do not add vehicle capacity 4. Projects that would not result in a net increase of VMT 5. Affordable housing projects 6. Small projects	Screening does not provide information about the actual VMT changes associated with the project.	Screening most appropriate if consistent with applicable general plan and supported by substantial evidence.	**Project Screening** For discussion during City Council Study Session. Rely on screening if consistent with applicable general plan and supported by substantial evidence demonstrating cumulative VMT is declining. For project-by-project VMT analysis with VMT screening, most projects will likely not screen out, which will require a more complete VMT analysis. Apply screening for the following project types: • Small Developments • Projects in Low-VMT Areas • Projects in Proximity to Major Transit Stops • Affordable Housing Projects • Local-Serving Retail Projects less than 10,000 square feet • Transportation Projects that do not add Vehicle Capacity The Santa Clara Countywide VMT Estimation Tool will be applied for screening as follows: • Low VMT generation map-based screening of residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without local serving retail space. • Transit priority areas (TPAs)/major transit stops and high-quality transit corridor (HQTC) screening.

[3] CEQA Guidelines Section 15064.3 states that projects that would reduce VMT or are located in a TPA should be presumed to have a less than significant impact on VMT. The OPR Technical Advisory contains other potential screening options.

Lead Agency Decisions	Common Options	Common Limitations	Considerations	City of Cupertino Initial Recommendations for SB 743 Implementation

What is the VMT impact significance threshold for land use projects and land use plans under baseline conditions?	1. Lead agency discretion consistent with general plan and expectations for 'project scale' VMT reductions not accounted for in general plan EIR and supported by substantial evidence.
	2. OPR 15% below baseline average a city or region (light-duty vehicles only)[4]
	3. CARB 14.3% below baseline (2018) average of jurisdiction (all vehicles)
	4. CARB 16.8% below baseline (2018) average of jurisdiction (light-duty vehicles only)
	5. Pending Caltrans-recommended threshold (net zero VMT)[5]
		Difficult for lead agencies to determine what level of VMT change is unacceptable when viewed solely through a transportation lens.
		
		Uncertainty of VMT trends contributes to difficulty in setting thresholds. Connecting a VMT reduction expectation to baseline helps to reduce uncertainty associated with future conditions.
			Since VMT is already used in air quality, GHG, and energy impact analysis, lead agencies should review thresholds used for those analyses to help inform new thresholds exclusively for transportation purposes.
			
			Lead agencies should carefully consider how they value state goals for VMT/GHG reduction in light of other general plan and community objectives. Translating state goals into VMT thresholds should consider substantial evidence such as California Air Resources Board 2017 Scoping Plan - Identified VMT Reductions and Relationships to State Climate Goals, January 2019, CARB.
			
			Absent development of a specific VMT threshold, lead agencies may rely on those of other state agencies. The CARB thresholds are supported by substantial evidence related to state air quality and GHG goals, but do not consider recent VMT trends or the potential influence of emerging mobility options such as autonomous vehicles (AVs).
				VMT Significance Threshold for Land Use Projects: Baseline Conditions
				
				For discussion during City Council Study Session.
				
				Set baseline VMT threshold based on long-term statewide expectations for air quality and GHG emissions. Example baseline thresholds are as follows.
				
				• Land Use Projects
				  ○ Project Impact: A significant impact would occur if the VMT rate for the project would exceed a level of X% below the countywide baseline VMT rate.
				  ○ Project Effect: A significant impact would occur if the project increases total (boundary) citywide VMT compared to baseline conditions.
				• Land Use Plans:
				  ○ Project Impact: A significant impact would occur if the VMT rate for the plan area would exceed a level of X% below the countywide baseline VMT rate.

[4] The OPR and CARB thresholds do not consider the long-term influence of TNCs, internet shopping, new mobility options, or autonomous vehicles.

[5] Caltrans has released draft Interim Guidance on "*Determining CEQA Significance for GHG Emissions for Projects on the State Highway System*" that recommends that any increase in GHG emissions would constitute a significant impact. This has been referred to as the "Net Zero VMT threshold". Caltrans has thus far signaled that this threshold would be applied only to transportation projects.

Lead Agency Decisions	Common Options	Common Limitations	Considerations	City of Cupertino Initial Recommendations for SB 743 Implementation

What is the VMT impact significance threshold for land use projects and land use plans under cumulative conditions?	1. Use a regional travel model to analyze the 'project's effect on VMT' based on RTP/SCS consistency (projects should not increase the regional total project generated VMT or total boundary VMT forecast used to support the RTP/SCS air quality conformity and SB 375 GHG targets).
	2. A lead agency can use the project analysis above if based on an efficiency metric form of VMT and evidence exists to demonstrate that cumulative trends in VMT rates are declining.
	3. Establish a VMT reduction threshold for cumulative conditions consistent with long-term air pollution and GHG reduction expectations.
		Uncertainty of VMT trends makes a cumulative impact finding less certain.
		Ability for a lead agency to identify the project's effect on land supply and corresponding VMT. Land use projects change land supply and the allocation of future population and employment growth. As such cumulative analysis should maintain the same control totals of regional population and employment growth.
		Requires knowledge of the forecasting tools available to test the project's effect on land supply and VMT.
			Analyze the project's effect on land supply and VMT using an appropriate valid model. For impact findings, consider all available substantial evidence including 2018 Progress Report, California's Sustainable Communities and Climate Protection Act, November 2018, CARB and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Specific research examples include Fehr & Peers AV effect model testing.	**VMT Significance Threshold for Land Use Projects: Cumulative Conditions**
				For discussion during City Council Study Session.
				Analyze the project's effect on land supply and VMT using an appropriately valid travel model. For impact findings, consider all available substantial evidence including *California Air Resources Board 2017 Scoping Plan Identified VMT Reductions and Relationships to State Climate Goals*, January 2019, and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). The following are suggested cumulative thresholds.
				• Land Use Projects:
				  ○ Project Effect: A significant impact would occur if the project increases total (boundary) citywide VMT compared to cumulative no project conditions.
				• Land Use Plans:
				  ○ Project Effect: A significant impact would occur if growth in the plan area increases total (boundary) citywide VMT compared to cumulative no project conditions.
				All land use and transportation projects: A significant impact would occur if the project is inconsistent with the Regional Transportation Plan/Sustainable Community Strategy Plan (Plan Bay Area).

What is the VMT impact significance threshold for transportation projects under baseline and cumulative conditions?	Lead agencies have discretion to choose their own metrics and thresholds for transportation project impact analysis. If VMT is selected, OPR recommends treating projects that reduce, or have no impact on, VMT to be presumed to have a less than significant impact.	Continued use of LOS is uncertain because of *CEQA Guidelines* Section 15064.3(b)(2) and 15064.7(d)(2). Transit, especially on-demand transit service, can generate new VMT, which should be considered as part of impact conclusions.	Consult CEQA legal advice about whether lead agency discretion allows continued use of LOS and whether VMT is required. VMT is required as an input to air quality, GHG, and energy impact analysis and should include induced vehicle travel effects.	**VMT Significance Threshold for Transportation Projects: Baseline and Cumulative Conditions** For discussion during City Council Study Session. • Baseline Transportation Threshold: A significant impact would occur if a project causes a net increase in total regional VMT compared to baseline conditions or opening year no project conditions. • Cumulative Transportation Threshold: A significant impact would occur if the project causes a net increase in total regional VMT compared to cumulative no project conditions.

Lead Agency Decisions	Common Options	Common Limitations	Considerations	City of Cupertino Initial Recommendations for SB 743 Implementation
What VMT reduction or mitigation strategies are feasible?	Menu of built environment and transportation demand management (TDM) mitigation strategies contained in Quantifying Greenhouse Gas Mitigation Strategies, CAPCOA, 2010.	Built environment strategies require modifying the project, which may create inconsistencies with the project description and financial feasibility. TDM strategies are often building tenant dependent so their use requires on-going monitoring and adjusting to account for changes in build tenants and their travel behavior. Ad-hoc project-by-project mitigation is less effective for reducing VMT than larger scale program-based approaches such as an impact fee program.	Develop a VMT mitigation program using any of the following approaches. 1. Impact fee program based on a VMT reduction nexus. 2. In-lieu fee program for VMT reducing actions. 3. VMT mitigation bank or exchange program. 4. TDM ordinance applying to all employers.	**VMT Mitigation Strategies** Apply VMT reduction measures such as Transportation Demand Management (TDM) with a Transportation Management Association (TMA), site design, and regional policies (location efficiency, regional land use policies, and regional infrastructure) to reduce VMT on Cupertino streets. In the long-term, consider emerging VMT mitigation options such as a VMT cap, VMT fee, VMT bank, and/or VMT exchange.

Appendix B: VMT Threshold Examples

Adopted VMT Thresholds

Jurisdiction	Threshold	LOS Maintained?
City/County of San Francisco	Residential: 15% below regional VMT per capita Office: 15% below regional VMT per employee Retail: 15% below regional VMT per retail employee Mixed-Use: Evaluate each land use independently	No
City of Oakland	Residential: 15% below regional VMT per capita Office: 15% below regional VMT per employee Retail: 15% below regional VMT per retail employee	Yes
City of Elk Grove	All Land Use Types: 15% below city's 2015 baseline VMT of similar land uses	Yes
City of Los Angeles	Project VMT should be 15% below the existing average VMT in the relevant Planning Area. Existing VMT threshold ranges from 6.0 to 9.4 VMT per capita, and from 7.6 to 15.0 VMT threshold per employee, depending on the Planning Area.	Yes
City of San Jose	Residential: More stringent of: 1) 15% below citywide VMT per resident or 2) 15% below regional VMT per resident General Employment: 15% below existing regional VMT per employee Industrial Employment Uses: No higher than existing regional VMT per employee Retail Uses: Net increase in the total regional VMT Mixed-Use: Each land use component to be analyzed independently	Yes
City of Woodland	10% reduction in VMT per capita or VMT per service population compared to the General Plan 2035 VMT performance, or a 10% reduction compared to similar land uses	Yes
CSU System: All 23 Campuses	15% below regionwide average VMT	No
San Bernardino County	4% below existing average VMT per service population in unincorporated county (based on maximum achievable TDM reduction)	Yes

Sample of VMT Threshold Options Currently Under Consideration

Jurisdiction	Potential Threshold
Santa Barbara County	Option 1: Daily VMT is no higher than the baseline regional average VMT Option 2: Daily VMT is at least 16.8% below baseline conditions (refers to CARB target)
City of South San Francisco	15% below regional VMT per capita
City of San Bruno	14.3% below existing VMT per service population (based on CARB assessment)
Nevada County	Option 1: Total weekday VMT per service population is less than or equal to the baseline subarea average Option 2: Consistent with the jurisdiction's general plan and the Nevada County Regional Transportation Plan

Appendix C: Comparison of Available Travel Forecasting Models

FEHR PEERS

Appendix C – Travel Model Comparison

Date: March 17, 2020

To: Chris Corrao, City of Cupertino

From: Teresa Whinery and Daniel Rubins, Fehr & Peers

Subject: Comparison of Available Travel Forecasting Models for the City of Cupertino

SJ19-1989

Comparison of Available Travel Demand Models for the City of Cupertino

There are two types of travel forecasting models: activity-based (also called tour-based) models, such as the Metropolitan Transportation Commission (MTC) Travel Model One ("MTC travel model"), and trip-based models, such as the Santa Clara Valley Transportation Authority (VTA)-City/County Association of Governments of San Mateo County (C/CAG) Bi-County Model ("VTA travel model"). Either type of model can be used to develop VMT forecasts.[1] The *Technical Advisory: On Evaluating Transportation Impacts in CEQA* (Governor's Office of Planning and Research, December 2018) specifies that the VMT evaluation should ideally capture the full length of the trips being analyzed and should not truncate those trips at jurisdictional or model boundaries.

Both models named above cover the entire nine-county Bay Area region; the VTA model also includes additional travel data pertaining to trips between the Bay Area and the Association of Monterey Bay Area Governments (AMBAG) region. The MTC travel model is produced largely to comply with federal and state laws related to preparing regional transportation plans (RTPs), air quality conformity, and greenhouse gas (GHG) analysis for sustainable communities strategies

[1] Also considered was the Caltrans Statewide Travel Demand Model; however, the Caltrans travel forecasting model is meant for statewide analysis and does not have enough detail in the travel forecasting model to be applied in the City of Cupertino.

(SCS). The MTC travel model is an activity-based (or tour-based) model, meaning it can track VMT separately for different categories of people (residents, workers, students). Our investigations and applications of the MTC travel model have revealed the use of input parameters that are not reasonably foreseeable, such as land use growth allocations inconsistent with local general plans, substantial increases in telecommuting or other TDM strategies, and implementation of travel pricing.

The VTA travel model includes a more detailed representation of the Santa Clara County transportation network and land use patterns, and is the model that has traditionally been used for most project-specific applications in Santa Clara County jurisdictions. The VTA travel model is a trip-based model, which means it is difficult to measure the VMT generated by residents and workers if those trips are not either home-based or home-based work.

Additional detail is summarized below for the MTC and VTA travel models based on Association of Bay Area Government (ABAG) 2017 land use projections (Plan Bay Area 2040 land use projections) and future regional transportation infrastructure consistent with *Plan Bay Area 2040* (July 2017). In addition, the end of this memorandum includes the following list of figures showing the comparison between the MTC and VTA models.

- Figure C-1: MTC Travel Forecasting Model Transportation Analysis Zone Coverage
- Figure C-2: VTA Travel Forecasting Model Transportation Analysis Zone Coverage
- Figure C-3: MTC Travel Forecasting Model Transportation Analysis Zones, Roadway Network, and Cupertino Jurisdictional Boundaries
- Figure C-4: VTA Travel Forecasting Model Transportation Analysis Zones, Roadway Network, and Cupertino Jurisdictional Boundaries

Once a model is selected, the travel forecasting model should be checked to confirm that it is regularly calibrated and validated, that it is reasonably sensitive to future changes that can affect VMT, and whether it has any geographic limitations (such as truncating trips at a jurisdictional boundary) that would need to be compensated for when using it to produce VMT forecasts.

Travel Analysis Zones

Land use and socioeconomic data are represented in models by Travel Analysis Zones, or TAZs. A comparison of various TAZ elements between the MTC and VTA travel models is provided in **Table 1**. In summary, the VTA travel model TAZ system has a higher resolution than the MTC travel model, in addition to more precise alignment with freeways, as well as city/town and natural boundaries. The MTC model TAZ system is less refined within Cupertino, which could result in a higher percentage of internalized trips and a more incomplete accounting of VMT generated by projects in the City of Cupertino.

Table 1: Travel Analysis Zones (TAZ) Network Comparison

Criteria	MTC Travel Model	VTA Travel Model
Model Coverage	Nine-county Bay Area.	Nine-county Bay Area, AMBAG (3 counties), and portions of Central Valley.
Cupertino	Coarse TAZ system, roughly matching Census Tract geography.	Smaller TAZ system than the MTC travel model, allowing for more land use detail in San Mateo County and Santa Clara County.
Alignment	Boundaries are generally aligned with natural and freeway boundaries, but does not match boundaries for all communities due to larger size of zones.	Boundaries are more precisely aligned to natural and manmade boundaries (e.g. city boundaries, freeways, main thoroughfares, etc.).
Land Use Input Type	Model utilizes separate year-specific land use input files for each scenario that include year-specific socio-economic data.	Model utilizes separate year-specific land use input files for each scenario that include year-specific socio-economic data.
Summary	The MTC travel model TAZ system is less refined within Santa Clara County and significantly less refined within the unincorporated portions of the county, which could result in a higher percentage of internalized trips and a more incomplete accounting of localized VMT generated by projects in Cupertino and Santa Clara County.	The VTA travel model TAZ system has a higher resolution, as well as more precise alignment with freeways and city/natural boundaries; may result in more complete VMT estimates. Areas west of CA-85 have a coarser level of detail, but still has more detail than the MTC travel model.

Source: MTC and VTA travel models, Fehr & Peers, 2020.

Highway Network

The highway networks between the MTC and VTA travel models were compared, as summarized in **Table 2**. Based on our review, the VTA travel model network is more detailed than the MTC travel model network, although both have a very coarse level of roadway representation for local roads in areas west of CA-85.

Table 2: Highway Network Comparison

Criteria	MTC Travel Model	VTA Travel Model
Level of Detail	Low-Medium: Network only includes major collectors and above streets.	Medium-High: Network includes some local streets and minor collectors and above streets.
Centroid Connectors	Collectors and residential streets are generally represented by centroid connectors.	Residential streets are generally represented by centroid connectors.

Table 2: Highway Network Comparison		
Criteria	**MTC Travel Model**	**VTA Travel Model**
Attributes	Link: List of attributes include distance, number of lanes, improvement years, area type, facility type, free flow speed, travel time, capacity, etc. Speed/Capacity: Uses speed/capacity look-up table (limited capacity to modify link speed/capacity). Node: Nodes do not have detailed attributes.	Link: Similar to MTC travel model. Speed/Capacity: Similar to MTC travel model. Node: Similar to MTC travel model.
Network Type	Model utilizes separate year-specific highway network input files for each scenario.	Similar to MTC travel model
Non-Auto Modes	Non-motorized skims and transit accessibility.	Non-motorized skims and transit accessibility.
Summary	The network has a reasonable amount of detail but may not fully represent some of the nuance of intra-City travel patterns	Regional roadways and major arterial. More detailed roadway networks in both San Mateo and Santa Clara counties. The network has more detail than the MTC travel model and the ability to estimate VMT to the minor arterial/collector level. Accuracy in coastal communities may still be less than ideal.

Source: MTC and VTA travel models, Fehr & Peers, 2020.

Model Methods

Table 3 provides a comparison of various model parameters, including run time, software requirement, and ease of use. In summary, the VTA travel model can be run in 8-12 hours on most computers by most consultants; because it is a trip-based model, it is difficult to measure VMT generated by residents and workers that is not home-based or work-based. The MTC travel model takes a minimum of 24 hours and can only be run on a server-based computer by a small handful of consultants; it is an activity-based model and can measure VMT generated by residents and workers separately, inclusive of all daily travel activity.

Table 3: Model Process Comparison		
Criteria	**MTC Travel Model**	**VTA Travel Model**
Runtime	Base year model runtime of roughly 24 hours on a server-based computer with 32 computing cores and 128 GB of RAM.	Base year model runtime of roughly 8 to 12 hours on virtually any desktop machine.

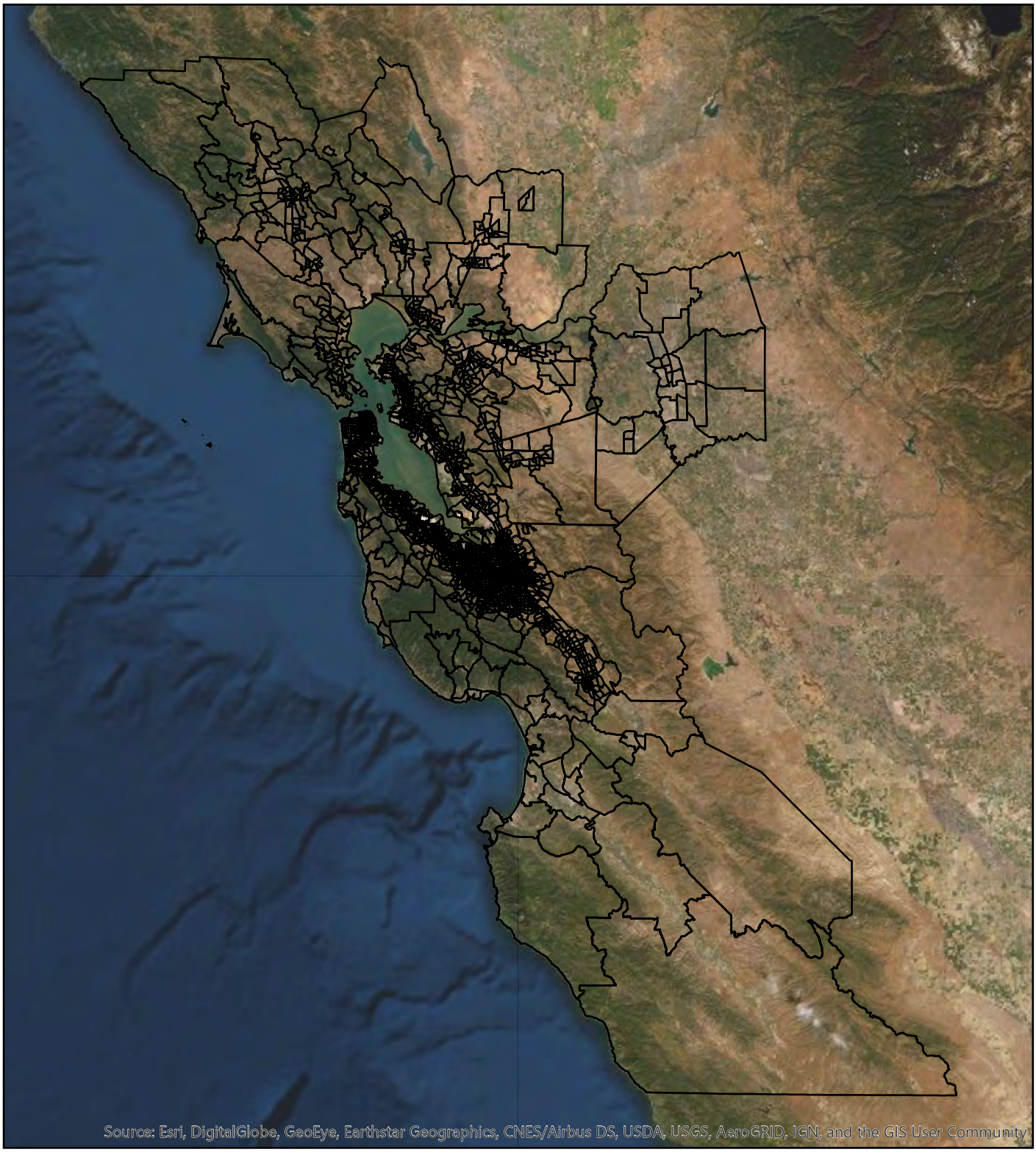
Table 3: Model Process Comparison

Criteria	MTC Travel Model	VTA Travel Model
Type	4-step model Activity-based model: socio-economic-based trip generation at the person-level that maintains a linkage of trips throughout the day to ensure modal consistency, making it capable of measuring VMT generated by residents and workers separately, as well as a total measure of VMT generation.	4-step model Trip-based model: socio-economic-based trip generation that gets generalized and aggregated into unlinked trips at the TAZ-level, making it difficult to measure VMT generated by residents and workers separately but fully capable of providing a total measure of VMT generation.
Model Software Platform	Citilabs – Cube/Voyager	Citilabs – Cube/Voyager
Other Required Software	Java R Python Windows Server	None
Use	Few consultants and no municipal agencies will have access to a server-based multi-core platform and the Java expertise required to run the model, limiting the pool of potential users of the model. There is not a few to use the MTC travel model, but specialized software and knowledge is needed to run it properly.	VTA staff has access to edit the model, and VTA member agencies use the model based on the terms of a model use agreement (a fee is charged to member agencies to acquire the travel model). Non-member agencies, consultants, and developers have limited access to the travel model.
Base Year	2015	2015
Forecast Years	2020 2030 2035 2040	2025 (an intermediate scenario) 2040
Summary	The MTC travel model can only be run on a server-based computer by a small handful of consultants and is capable of measuring VMT generated by residents and workers separately.	The VTA travel model can be run in 8 to 12 hours on virtually any desktop machine by most agency staff or consultants; a trip-based model type makes it difficult to measure VMT generated by residents and workers that is not home-based or work-based.

Source: MTC and VTA travel models, Fehr & Peers, 2020.

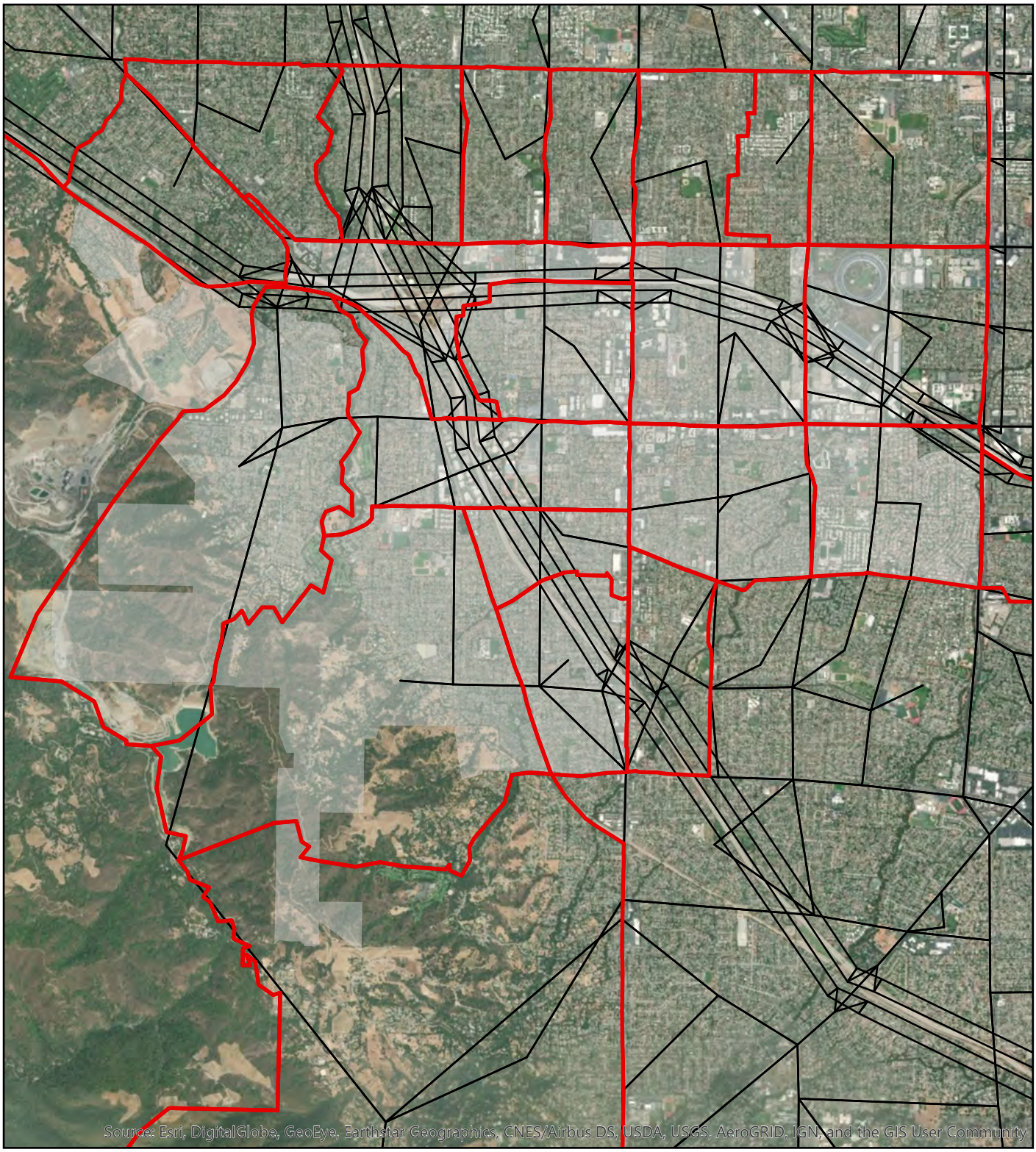
MTC Travel Forecasting Model Transportation Analysis Zones (TAZs)

Figure C-1: MTC Travel Forecasting Model Transportation Analysis Zone Coverage



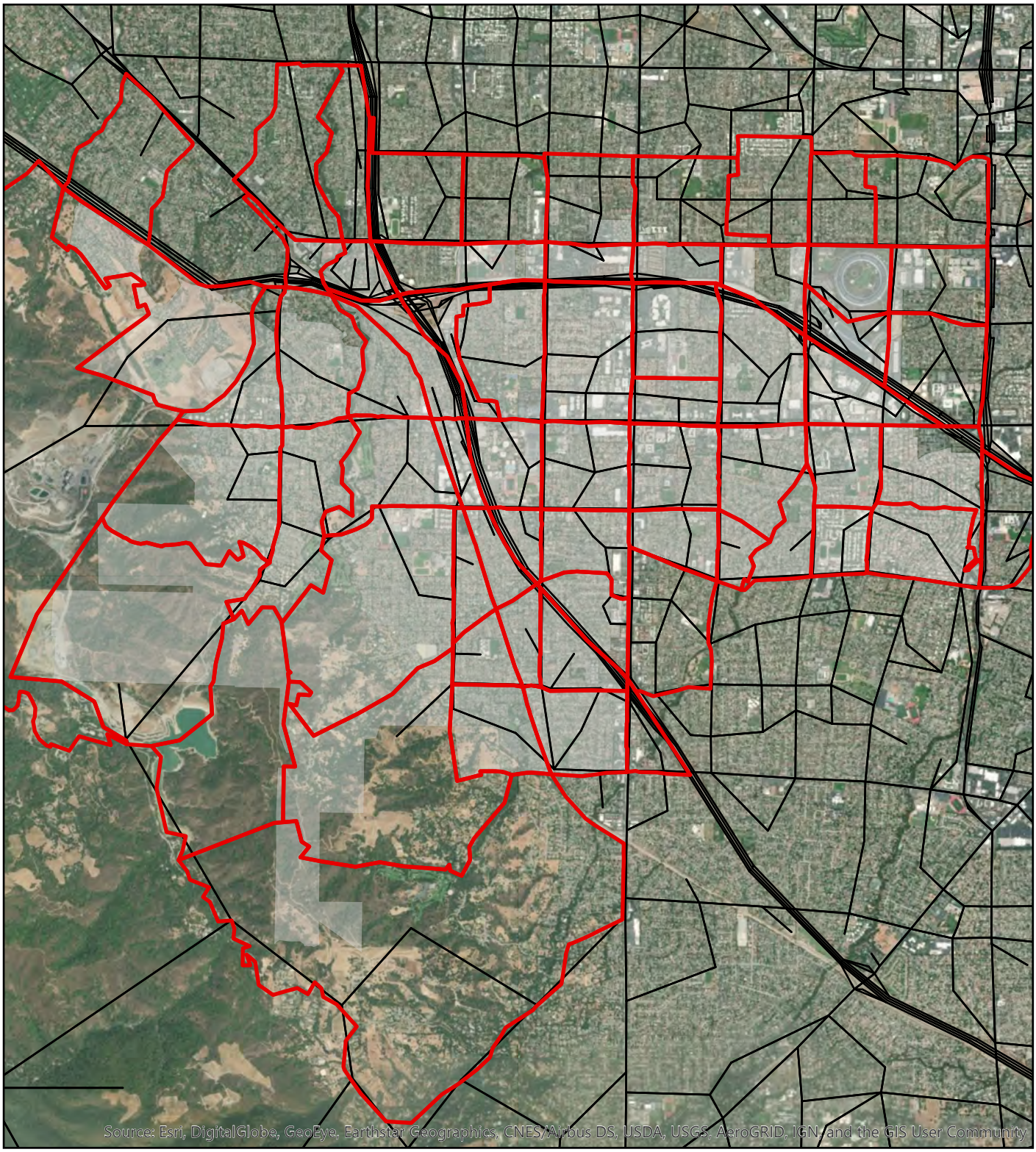
VTA Travel Forecasting Model Transportation Analysis Zones (TAZs)

Figure C-2: VTA Travel Forecasting Model Transportation Analysis Zone Coverage



Cupertino City Limits
MTC Model Roadway Network
Cupertino and nearby MTC Travel Analysis Zones

Figure C-3: MTC Travel Forecasting Model Roadway Network and Transportation Analysis Zones in Cupertino



Cupertino City Limits
VTA Model Roadway Network
Cupertino and nearby VTA Travel Analysis Zones

Figure C-4: VTA Travel Forecasting Model Roadway Network and Transportation Analysis Zones in Cupertino

Appendix D: Additional VMT Thresholds Background and Options Discussion

FEHR PEERS

Appendix D – VMT Thresholds

Date: March 17, 2020

To: Chris Corrao, City of Cupertino

From: Daniel Rubins and Teresa Whinery, Fehr & Peers

Subject: Additional Background on VMT Thresholds

SJ19-1989

The purpose of this memorandum is to provide additional background on CEQA thresholds to comply with new California Environmental Quality Act (CEQA) requirements under Senate Bill (SB) 743. The options are focused on land use plans and land use projects, which will be required to be analyzed using VMT as of July 1, 2020. For transportation projects, the City of Cupertino has the discretion to select its own VMT metrics and thresholds, and no change to current practice may be necessary; however, lead agencies should carefully review the latest CEQA Guidelines changes related to Sections 15064, 15064.3, and 15064.7. Changes to these sections affect the selection of significance thresholds and may influence future CEQA expectations, even for transportation projects.

VMT Thresholds

Background on CEQA Thresholds

Establishing CEQA thresholds for VMT requires complying with the statutory language added by SB 743, as well as guidance contained in CEQA Guidelines Sections 15064, 15064.3, and 15064.7. The excerpts below highlight the amendments to the two CEQA Guidelines Sections that were certified by the California Natural Resources Agency and the Office of Administrative Law at the end of 2018.

§ 15064. Determining the Significance of the Environmental Effects Caused by a Project.

(a) Determining whether a project may have a significant effect plays a critical role in the CEQA process.

(1) If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, the agency shall prepare a draft EIR.

(2) When a final EIR identifies one or more significant effects, the lead agency and each responsible agency shall make a finding under Section 15091 for each significant effect and may need to make a statement of overriding considerations under Section 15093 for the project.

(b) **(1)** The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

(2) Thresholds of significance, as defined in Section 15064.7(a), may assist lead agencies in determining whether a project may cause a significant impact. When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant. Compliance with the threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant.

Source: *Final Adopted Text for the 2018 Amendments and Additions to the State CEQA Guidelines.* California Natural Resources Agency (p. 8), https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf

New Section 15064.3. Determining the Significance of Transportation Impacts.

(a) Purpose.

This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact.

(b) Criteria for Analyzing Transportation Impacts.

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152 .

(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

(4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

(c) Applicability.

The provisions of this section shall apply prospectively as described in section 15007. A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide.

Note: Authority cited: Sections 21083 and 21099, Public Resources Code. Reference: Sections 21099 and 21100, Public Resources Code; *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 17 Cal.App.5th 413; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256; *California Clean Energy Committee v. City of Woodland* (2014) 225 Cal. App. 4th 173.

Source: *Final Adopted Text for the 2018 Amendments and Additions to the State CEQA Guidelines.* California Natural Resources Agency (p. 11-13), https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf.

§ 15064.7. Thresholds of Significance.

(a) ~~**Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects**~~**.** A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

(b) **Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.** Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. **Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).**

(c) When adopting **or using** thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

(d) Using environmental standards as thresholds of significance promotes consistency in significance determinations and integrates environmental review with other environmental program planning and regulation. Any public agency may adopt or use an environmental standard as a threshold of significance. In adopting or using an environmental standard as a threshold of significance, a public agency shall explain how the particular requirements of that environmental standard reduce project impacts, including cumulative impacts, to a level that is less than significant, and why the environmental standard is relevant to the analysis of the project under consideration. For the purposes of this subdivision, an "environmental standard" is a rule of general application that is adopted by a public agency through a public review process and that is all of the following:

(1) a quantitative, qualitative or performance requirement found in an ordinance, resolution, rule, regulation, order, plan or other environmental requirement;

(2) adopted for the purpose of environmental protection;

(3) addresses the environmental effect caused by the project; and,

(4) applies to the project under review.

Source: *Final Adopted Text for the 2018 Amendments and Additions to the State CEQA Guidelines*. California Natural Resources Agency (p. 14-15), https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf.

As noted in the CEQA sections above, lead agencies have the discretion to select thresholds on a case-by-case basis or develop and publish thresholds for general use. The remainder of this memo focuses on guidance related to adopting thresholds for general use.

When developing and adopting new thresholds, the CEQA Guidelines are clear that thresholds must be supported by substantial evidence. For SB 743, the specific metric of focus is the change a project will cause in VMT, which is an indirect measure of greenhouse gas emissions and air pollution. Since VMT is already used in the analysis of air quality, energy, and GHG impacts as part of CEQA compliance, the challenge for lead agencies is to answer the question, "What type or amount of change in VMT constitutes a significant impact for transportation purposes?" CEQA Guidelines Section 15064(b)(1) allows lead agencies the discretion to select their own thresholds and allow for differences in thresholds based on context such as urban versus rural areas.

OPR VMT Threshold Recommendations for Land Use Projects

SB 743 includes the following legislative intent statements, which were used to help guide OPR's VMT threshold recommendations.

- *New methodologies under the California Environmental Quality Act are needed for evaluating transportation impacts that are better able to promote the state's goals of reducing greenhouse gas emissions and traffic-related air pollution, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations.*
- *More appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions.*

To support these legislative intent statements, threshold recommendations are found in Section 15064.3 of the 2018 CEQA Guidelines amendments and the *Technical Advisory on Evaluating Transportation Impacts in CEQA,* California Governor's Office of Planning and Research (OPR) (December 2018). Specific excerpts and threshold highlights are provided below.

> CEQA Guidelines Section 15064.3
>
> *(b) Criteria for Analyzing Transportation Impacts.*
>
> *(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.*

(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

Technical Advisory on Evaluating Transportation Impacts in CEQA (page 10)

Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold.

Technical Advisory on Evaluating Transportation Impacts in CEQA – Rural Projects Outside of Metropolitan Planning Organizations (MPOs) (page 19)

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

The recognition that rural areas are different is consistent with the flexibility provided by CEQA Guidelines Section 15064(b)(1). In these areas, VMT per resident or per employee tends to be higher than in urban areas due to longer distances between origins and destinations and limited travel mode choices.

These (and the other) threshold recommendations in the *Technical Advisory* are intended to help achieve the State of California's GHG reduction goals and targets considered in development of OPR's *Technical Advisory,* as follows;

- Assembly Bill 32 (2006) requires statewide greenhouse gas reductions to 1990 levels by 2020 and continued reductions beyond 2020.
- Senate Bill 32 (2016) requires at least a 40% reduction in greenhouse gas emissions by 2030.
- Pursuant to Senate Bill 375 (2008), the California Air Resources Board establishes greenhouse gas reduction targets for MPOs to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies. At the time the Technical Advisory was released, target reductions

by 2035 for the largest MPOs ranged from 13% to 16%. The current targets for these MPOs are 19%.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40% below 1990 levels by 2030.
- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80% below 1990 levels by 2050.
- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80% below 1990 levels by 2050 specifically for transportation.
- Senate Bill 391 requires the California Transportation Plan to support 80% reduction in GHGs below 1990 levels by 2050.
- The California Air Resources Board Mobile Source Strategy (2016) describes California's strategy for containing air pollutant emissions from vehicles and quantifies VMT growth compatible with achieving state targets.
- The California Air Resources Board's 2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target describes California's strategy for reducing greenhouse gas emissions from vehicles and quantifies VMT growth compatible with achieving state targets.
- The Caltrans Strategic Management Plan (2015) calls for a 15% reduction in VMT per capita compared to 2010 levels by 2020.
- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter.

Lead agencies should note that the OPR-recommended VMT thresholds are focused upon GHG reduction goals. As OPR's *Technical Advisory* (p. 8) explains:

> *The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.*

While this is one of the SB 743 legislative intent objectives, a less clear connection is made to the other legislative intent objectives to encourage infill development and promote active transportation. SB 743 [Section 21099(b)(1)] also makes it explicit that criteria for determining the significance of transportation impacts shall promote "*…the reduction of greenhouse gas emissions, the development of multimodal networks, and a diversity of land uses.*" If GHG impacts are already being adequately addressed in another CEQA section, then more evidence may be desired about VMT threshold relationships to the other criteria. In particular, how should lead agencies balancing the accommodation of housing needs that contribute to land use diversity but also contribute to VMT increases? Given the status of housing supply shortages and affordability in California, this is not a small issue. The use of VMT as a new impact metric will likely trigger more significant impacts in suburban and rural areas that have the highest VMT generation rates and limited or costly mitigation options. Adding more impact mitigation costs to suburban and rural housing projects may be counter to land use diversity and adequate/affordable housing goals.

Another important distinction within the *Technical Advisory* is how projects within different land use contexts are treated. The general expectation that a 15% reduction below that of existing development may be reasonable is proposed for projects within urban areas of metropolitan planning organizations (MPOs). For rural areas outside MPOs, the *Technical Advisory* explains that VMT mitigation options are limited so thresholds may need to be set on a case-by-case basis. This rationale may not provide the best evidence for threshold setting. The intent of threshold setting is to determine what change in VMT would constitute a significant impact considering the expectations set forth in the SB 743 statute language and the associated CEQA Guidelines. While land use context is a valid consideration when setting thresholds, so are these expectations.

The *Technical Advisory* also makes specific VMT threshold recommendations for analyzing the impact of project generated VMT on baseline conditions, but also recommends that VMT analysis consider a project's long-term effects on VMT and whether the project is consistent with the Plan Bay Area (the Bay Area's Regional Transportation Plan (RTP)/Sustainable Communities Strategies (SCS)). These recommendations raise key questions for lead agencies, as addressed in the next section.

Lead Agency Discretion in Setting VMT Thresholds

Prior to SB 743 implementation, CEQA Guidelines Section 15064.7 allowed lead agencies the discretion to select their own transportation impact metrics, although substantial evidence was required to support their decisions. For transportation impact metrics, SB 743 deleted vehicle delay as a metric, and CEQA Guidelines Section 15064.3 provided that VMT is generally the most appropriate metric for land use projects. As to thresholds, additional questions have arisen as listed below.

- Question 1: Do lead agencies have discretion to set a different VMT threshold than recommended by OPR?

- Question 2: Do lead agencies need to establish VMT thresholds for cumulative impacts?
- Question 3: Do lead agencies need to use the same VMT methodology for setting thresholds and for conducting project VMT forecasts?

The answers to the first two questions require a legal perspective, and were informed by a memorandum prepared by Remy Moose Manley (RMM) as part of the WRCOG SB 743 Implementation Pathway project, whose opinion is summarized below. The full opinion is available as part of the WRCOG documentation at http://www.fehrandpeers.com/wrcog-sb743/ and a summary of the RMM selected findings is presented below.

Question 1: Do lead agencies have discretion to set a different VMT threshold than recommended by OPR?

Setting a threshold lower than the 15% reduction recommended by OPR in their *Technical Advisory* is likely legally defensible, so long as the threshold is supported by substantial evidence. The substantial evidence is critical in the threshold setting process and should explain why the OPR-recommended threshold is not appropriate for the lead agency or project, and why another threshold was selected. This evidence will be the basis for supporting the recommended threshold, and should carefully consider the definition of substantial evidence contained Section 15384 of the CEQA Guidelines. This answer considers the fact that the 15% reduction is not included in the statute or the updated CEQA Guidelines; rather it is only included in OPR's *Technical Advisory*. However, it is unknown how much weight future courts may give OPR's *Technical Advisory,* since this is where OPR complies with Section 21099(b)(1) to develop recommendations for significance criteria.

The revisions to the CEQA Guidelines only include statements about what land use project types and locations may be presumed to have a less than significant VMT impact. Additional evidence allowing for a lower threshold (i.e., less than 15%) is also found in the discussion above about the recognition of land use context influencing VMT performance.

Question 2: Do lead agencies need to establish VMT thresholds for cumulative impacts?

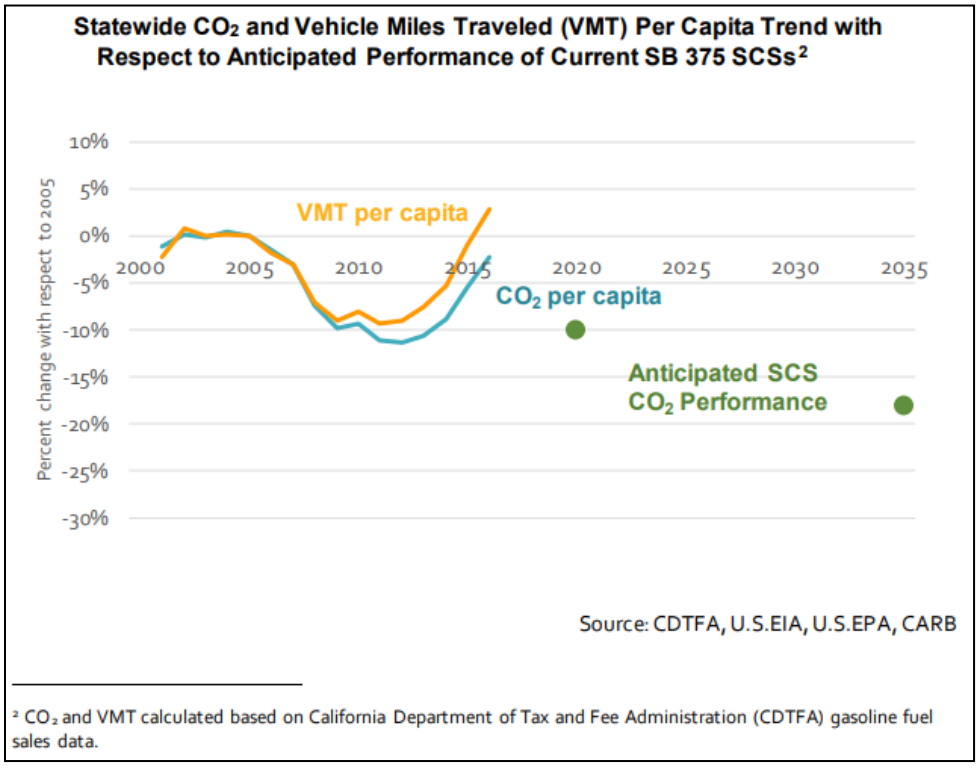
In addition to direct impact analysis, lead agencies should address VMT impacts in the cumulative context. The CEQA Guidelines (and the case law) are clear that consideration of cumulative impacts is important to CEQA compliance. That said, a separate quantitative threshold may not be required if the threshold applied for project-specific impacts is cumulative in nature. VMT thresholds based on an efficiency form of the metric, such as VMT per capita, can address both project and cumulative impacts in a similar manner that some air districts do for criteria pollutants and GHGs.

As explained in OPR's *Technical Advisory*, when using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate.

> *A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa.* (OPR *Technical Advisory*, p. 6.)

A key consideration for cumulative scenarios is whether the rate of VMT generation gets better or worse in the long-term. If the rate is trending down over time, then the project level analysis may suffice. However, the trend direction must be supported with substantial evidence. This creates a potential issue for VMT because per capita VMT rates in California have been increasing, a trend inconsistent with RTP/SCS projections showing declines. The chart below from the 2018 Progress Report California's Sustainable Communities and Climate Protection Act, California Air Resources Board, November 2018 charts recent VMT per capita trends. This evidence could be used to justify the need for separate cumulative analysis to verify a project's long-term cumulative effects.

Figure 1: California VMT Trends



Source: 2018 Progress Report California's Sustainable Communities and Climate Protection Act, California Air Resources Board, 2018

For some projects, measuring project-generated VMT will only tell part of the impact story, especially if they exceed a project threshold based on VMT per capita or a similar efficiency metric. Measuring the "project's effect on VMT" may be necessary to fully explain the project's impact, especially under cumulative conditions. This occurs because of the nature of discretionary land use decisions. Cities and counties influence land supply through changes to general plan land use designations and zoning for parcels. These changes rarely, if ever, influence the long-term amounts of regional population and employment growth. Viewed through this lens, a full disclosure of VMT effects requires capturing how a project may influence the VMT generated by the project and nearby land uses. Also, some mitigation strategies that improve walking, bicycling, or transit to/from the project site can also reduce VMT from neighboring land uses (for example, installing a bike-share station on the project site would influence the riding behavior of project residents and those living and working nearby).

Question 3: Do lead agencies need to use the same VMT methodology for setting thresholds and for conducting project VMT forecasts?

Lead agencies need to use consistent methods when forecasting VMT for threshold setting and project analysis to ensure an apples-to-apples comparison for identifying potential impacts. The project team has confirmed through case study comparisons[1] that failure to comply with this approach may lead to erroneous impact conclusions. This is an important finding, since the *Technical Advisory* also accepts that VMT analysis can be performed using sketch planning tools. Off-the-shelf sketch planning tools for VMT analysis usually do not contain trip generation rates or trip lengths consistent with local and regional travel forecasting models. These models are the most likely source for citywide and region-wide VMT estimates used in setting thresholds because sketch planning tools cannot produce these aggregate-level VMT metrics. The *Technical Advisory* partially recognizes this issue by recommending that sketch planning tools use consistent trip lengths as the models used to produce thresholds, but it does not include a similar

[1] The table below shows the results of using different VMT methods for a hypothetical project. The parenthetical numbers under city and region are the threshold values (15% below the baseline values in front of the parenthetical values). If the travel demand model was used to set the threshold values in the first row and the model was also used for the project analysis, then no impact would occur. If the project analysis instead used Institute of Transportation Engineers (ITE) trip generation rates and California Household Travel Survey (CHTS) trip lengths, then the project's 11.26 estimate would be higher than the model threshold values for both the city and region, resulting in a significant impact. Using thresholds derived from the ITE+CHTS data would have reversed this impact finding, demonstrating that consistent method is essential for avoiding erroneous impact conclusions.

VMT Method	Existing Home-Based VMT per Capita		
	City	Region	Project
Travel demand model	9.86 (*8.38*)	11.97 (*10.17*)	5.46
ITE + CHTS	23.90 (*20.32*)	25.67 (*21.82*)	11.26

recommendation for trip generation rates. Input variables, trip lengths, and trip generation rates need to be consistent with the travel forecasting model to produce accurate project impact analysis results.

Options for the City of Cupertino

So how should lead agencies approach VMT threshold setting given their discretion? Since an impact under CEQA begins with a change to the existing environment, a starting level for potential thresholds would be the baseline (i.e., existing condition) VMT, VMT per capita, VMT per employee, or VMT per service population. Since VMT would normally be expected to increase or fluctuate with population and employment growth, changes in economic activity, and expansion of new vehicle travel choices (i.e., Uber, Lyft, autonomous vehicles, etc.), expressing VMT measurement in an efficiency metric form allows for more direct comparisons to baseline conditions for land use projects, land use plans, and transportation projects. Establishing a threshold such as baseline VMT per service population would be essentially setting an expectation that future land uses will perform like existing land uses.

If VMT performance expectations start with baseline conditions, lead agencies can establish reductions from baseline levels, thereby lowering future VMT generation. How much of a reduction may depend on the values placed on vehicle use and its associated effects on mobility, economic activity, and environmental consequences. Working toward higher reductions in VMT becomes possible as the land use context changes to urban areas with higher densities and high-quality transit systems.

While OPR has developed specific VMT impact threshold recommendations for project-related impacts, current practice has not sufficiently evolved where a clear line can be drawn between "acceptable" and "unacceptable" levels of VMT change for the sole purpose of determining a significant transportation impact. Until SB 743, VMT changes were viewed through an environmental lens that focused on the relationship of VMT to fuel consumption and emissions. For transportation purposes, VMT has traditionally been used to evaluate whether land use or transportation decisions resulted in greater dependency on vehicle travel. Determining whether a portion of someone's daily vehicle travel is unacceptable or would constitute a significant transportation impact is generally not clear to lead agencies.

Another consideration in threshold setting is how to address cumulative VMT impacts and whether addressing them in the General Plan EIR is advantageous for streamlining the review of subsequent land use and transportation projects, given CEQA relief available through SB 375 or CEQA Guidelines Section 15183. This section of the Guidelines relieves a project of additional environmental review if the environmental impact was adequately addressed in the General Plan EIR and the project is consistent with the General Plan (see below).

15183. PROJECTS CONSISTENT WITH A COMMUNITY PLAN OR ZONING

(a) CEQA mandates that projects which are consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. This streamlines the review of such projects and reduces the need to prepare repetitive environmental studies.

The use of Section 15183 also addresses cumulative impacts as acknowledged in Section 15130(e).

15130. DISCUSSION OF CUMULATIVE IMPACTS

(e) If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j).

For the City of Cupertino, addressing transportation VMT impacts in the City General Plan EIR could be useful in understanding how VMT reduction should be balanced against other community values when it comes to setting new VMT impact thresholds for SB 743.

Given this information, the City of Cupertino has at least four options for setting VMT thresholds.

- Option 1: Rely on the OPR Technical Advisory suggestion to set thresholds consistent with State of California goals for air quality, greenhouse gas, and energy conservation.
- Option 2: Use a threshold adopted or recommended by another public agency consistent with lead agency air quality, GHG reduction, and energy conservation goals
- Option 3: Set jurisdiction-specific VMT thresholds based on substantial evidence
- Option 4: Set thresholds based on baseline VMT performance

Each of these options is discussed below.

Option 1: Rely on the OPR Technical Advisory suggestion to set thresholds consistent with State of California goals for air quality, greenhouse gas, and energy conservation.

The first option is to simply rely on the threshold recommendations contained in the OPR *Technical Advisory*. As noted above, the general expectation is that land use projects should be measured against VMT per capita or VMT per worker threshold of 15% below that of baseline conditions (i.e., existing development). Specific VMT thresholds for residential, office (work-related), and retail land uses are summarized below.

- Residential projects – A proposed project exceeding a level of 15% below existing (baseline) VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita, a citywide VMT per capita, or as geographic sub-area VMT per capita.
- Office projects – A proposed project exceeding a level of 15% below existing (baseline) regional VMT per employee may indicate a significant transportation impact.
- Retail projects – A net increase in total (boundary) VMT may indicate a significant transportation impact.
- Mixed-use projects – Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture.
- Other project types – Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types.
- Redevelopment projects – Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

For land use plans (i.e., a general plan, policy area plan, or specific area plan), a significant impact would occur if the respective thresholds above were exceeded in aggregate. This means that new population and employment growth combined with the planned transportation network would need to generate future VMT per capita or VMT per worker that is less than 85% of the baseline value to be considered less than significant. Land use project and land use plans would also need to be consistent with the jurisdiction General Plan.

A potential limitation of the OPR recommendations is that the substantial evidence used to justify the thresholds is largely based on the State of California air quality and GHG goals. Three issues arise from this reliance:

1. The OPR-recommended threshold does not establish a level of VMT reduction that would result in California meeting its air quality and GHG goals according to the *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* (2019). This may create confusion with air quality and GHG impact analysis in environmental documents, which should already address the influence of VMT.

2. The OPR-recommended thresholds do not directly reflect expectations related to the other SB 743 objectives related to statewide goals to promote public health through active transportation, infill development, multimodal networks, and a diversity of land uses. Recommending a reduction below baseline levels is consistent with these objectives, but the numerical value has not been tied to specific statewide values for each objective or goal.

3. State of California expectations for air quality and GHG may not align with local/lead agency expectations. Using State expectations for a local lead agency threshold may create inconsistencies with local city or county general plans.

Option 2: Use a threshold adopted or recommended by another public agency consistent with lead agency air quality, GHG reduction, and energy conservation goals

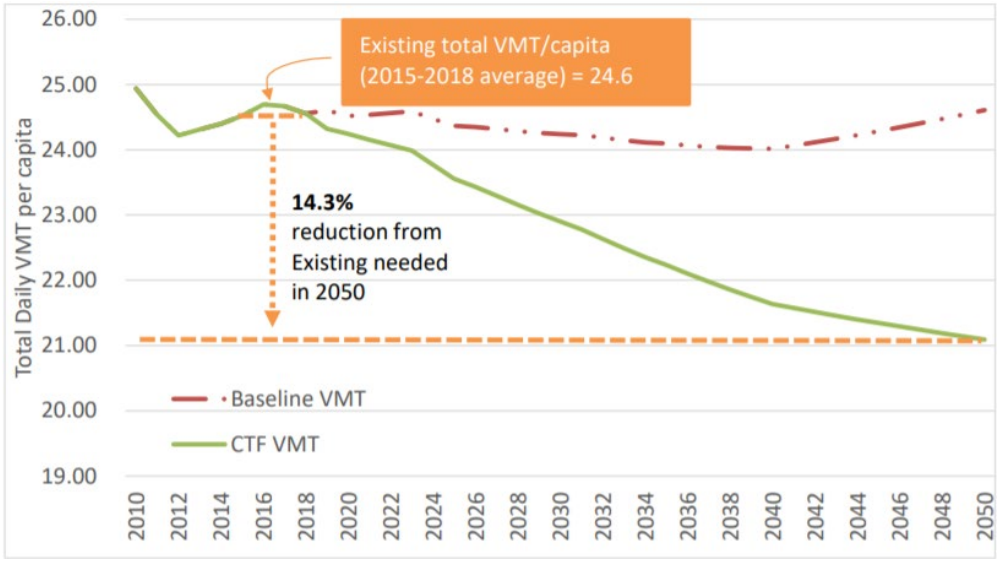
This option sets a threshold consistent with local air quality, GHG reduction, and energy conservation goals. This approach requires that local air quality and GHG reduction goals in general plans, climate action plans, or GHG reduction plans comply with the legislation and associated plans described earlier.

- 2000 levels by 2010
- 1990 levels by 2020
- 80% below 1990 levels by 2050

SB 32 expanded on these goals and added the expectation that the state should reach 40% below 1990 levels by 2030, followed by SB 391 requirements for the California Transportation Plan to support 80% reduction in GHGs below 1990 levels by 2050. With respect to the land use and transportation sectors, SB 375 tasked CARB with setting specific GHG reduction goals through the RTP/SCSs prepared by MPOs.

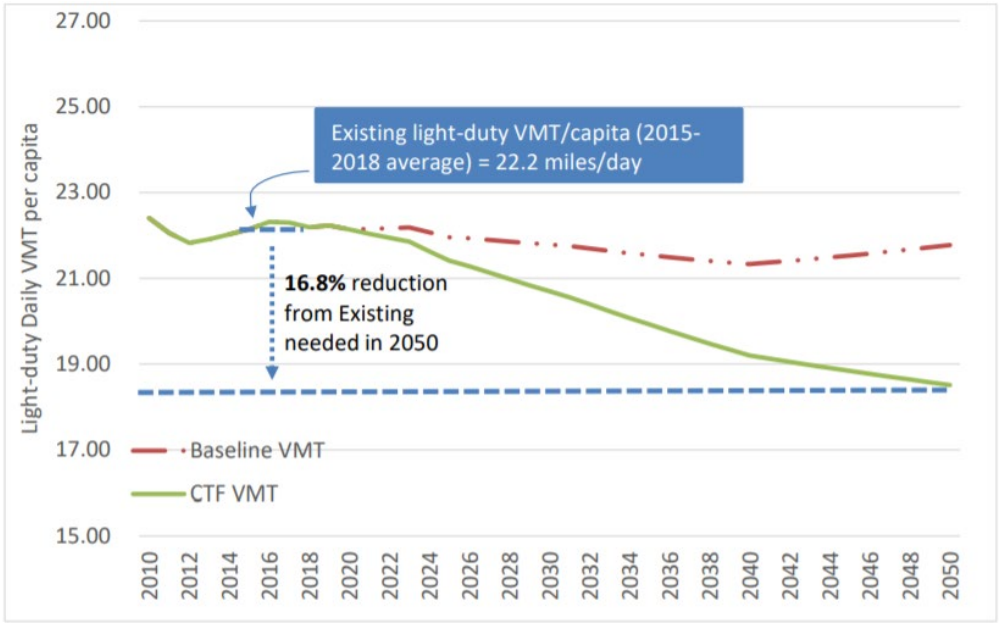
The CARB *Scoping Plan* and *Mobile Source Strategy* provide analysis related to how the state can achieve the legislative and executive goals, while the Caltrans *Strategic Management Plan* and *Smart Mobility Framework* provide supportive guidance and metrics. An important recognition of the CARB *Scoping Plan* and *Mobile Source Strategy* is that the initial SB 375 targets were not aggressive enough. The CARB *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* document provides updated information on VMT reductions needed to meet the State's GHG emission reduction targets by 2050. This document identifies two specific thresholds to meet these targets, a 14.3% reduction in total project generated VMT per capita, and a 16.8% reduction in light-duty vehicle project generated VMT per capita. While this evidence is tied largely to the State of California's emission reduction goals, the proposed project generated VMT reductions associated with this approach to thresholds would be supportive of multimodal networks, infill development, and greater land use diversity.

Figure 2: Statewide Total VMT/Capita



Source: *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, CARB (p. 10)
https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf

Figure 3: Statewide Light-Duty VMT/Capita



Source: *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, CARB (p. 11)
https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf

One benefit of relying on CARB or other state agencies for a threshold recommendation is the CEQA Guidelines provision in Section 15064.7(c) highlighted below.

§ 15064.7. Thresholds of Significance.

(a) ~~**Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.**~~ A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

(b) **Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.** Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. **Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).**

(c) When adopting **or using** thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

Source: Final Adopted Text for the 2018 Amendments and Additions to the State CEQA Guidelines. California Natural Resources Agency (p. 14) http://resources.ca.gov/ceqa/

CARB meets the criteria of being a public agency and having noted expertise in the areas of VMT and emissions analysis. Further, the recommended threshold values above were developed in specific consideration of SB 743 requirements.

One other agency threshold to consider is Caltrans. The Local Development-Intergovernmental Review (LD-IGR) Branch at Caltrans (https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/local-development-intergovernmental-review) has a responsibility to reduce potential adverse impacts of local development on the state transportation system. As part of its responsibilities, each district branch performs reviews of CEQA environmental documents for local land use projects. These reviews include providing expectations for transportation impact analysis, such as metrics and thresholds.

When Caltrans reviews CEQA documents, they may function as a reviewing agency or a responsible agency. In a responsible agency role, Caltrans has approval authority over some component of the project, such as an encroachment permit for access to the state highway system. Comments from Caltrans should be adequately addressed, and special attention should be paid to those comments when Caltrans serves as a responsible agency because an adequate response may be required to obtain its required approval.

Caltrans recently released a draft update to its Transportation Impact Study Guide (https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-02-26-transmittal-and-draft-vmt-focused-tisg.pdf). Key points from this draft include the following:

- Caltrans recommends use of OPR's recommended thresholds for land use projects.
- Caltrans supports CEQA streamlining for land use projects in transit priority areas and areas with existing low VMT, as described in OPR's Technical Advisory.
- Caltrans recommends following the guidance on methods of VMT assessment found in OPR's Technical Advisory.
- Caltrans comments on a CEQA document may note methodological deviations from those methods and may recommend that significance determinations and mitigation be aligned with State of California GHG reduction goals as articulated in that guidance, ARB's *Scoping Plan*, and related documentation.
- In rural areas, Caltrans may comment requesting VMT-reducing strategies for the rural area be included programmatically, including at the General Plan level, for example. Caltrans will also recommend establishment of programs or methods to reduce VMT and support appropriate bicycle, pedestrian, and transit infrastructure, services, or incentives.

With Caltrans endorsement of the recommended OPR thresholds, a state VMT threshold has been established for impacts to the state highway system. If a lead agency chooses a different threshold, they may have to complete more than one impact analysis.

Option 3: Set jurisdiction-specific VMT threshold based on substantial evidence

VMT is a composite metric that is created as an output of combining a community's long-term population and growth projections with its long-term transportation network (i.e., the General Plan). Other variables are also in play related to travel behavior, but land use changes and transportation network modifications are the items largely influenced or controlled by cities and counties. As such, each jurisdiction already has a VMT growth budget. This is the amount of VMT that is forecast to be generated from the jurisdiction's General Plan and the jurisdiction's buildout scenario assumptions combined with other travel behavior inputs for the region as captured in the travel forecasting model. This VMT growth has already been planned for and determined to be "acceptable" by the jurisdiction. Regional and state agencies also use the General Plan growth as part of their plans and environmental impact analysis. This level of VMT could serve as the basis of a VMT threshold expressed as a VMT growth budget or as a VMT efficiency metric based on the future year VMT per capita, VMT per employee, or VMT per service population. The measurement of VMT could occur at the geographic subarea level.

Potential limitations of this approach relate to the lack of a "baseline plus project" analysis and travel forecasting model sensitivity. If a General Plan includes policies or implementation programs designed to reduce VMT through transportation demand management (TDM) strategies, the current local and regional models did not include these effects. Further, current local and regional models do not capture major disruptive trend effects such as TNCs, AVs, and internet shopping. Including baseline and baseline plus project analysis could help capture some of these effects to the extent they are already influencing travel behavior.

Option 4: Set thresholds based on baseline VMT performance

As noted above, an impact under CEQA begins with a change to the existing or baseline environment. There are a range of approaches to using this starting point for VMT impact analysis. At one end of the spectrum is "total daily VMT" generated under baseline conditions. Setting this value as the threshold for a jurisdiction basically creates a budget where any increase would be a significant impact. Alternatively, the baseline VMT per capita, VMT per employee, or VMT per service population could be used to establish an efficiency metric basis for impact evaluation. Using this form of VMT would mean that future land use projects would be expected to perform no worse than existing land use projects, and only projects that cause an increase in the rate of VMT generation would cause significant impacts. Since VMT will increase or fluctuate with population and employment growth, changes in economic activity, and expansion of new vehicle travel choices (i.e., Uber, Lyft, autonomous vehicles, etc.), expressing VMT measurement in an efficiency metric form allows for more direct comparisons to baseline conditions for land use projects, land use plans, and transportation projects.

Under this option, a separate quantitative VMT threshold may not be set for cumulative conditions unless VMT trends are increasing over time. At a minimum, a qualitative assessment of RTP and General Plan consistency may still be included, depending on whether that analysis is already being conducted for the purposes of GHG impact analysis. In general, projects should avoid jeopardizing the air quality conformity and GHG reduction performance of other relevant plans.

Appendix E: Small Project Guidance

Small Project Screening for SB 743

The following document provides substantial evidence to support the screening on 'small' projects for SB 743 purposes. The California Office of Planning and Research *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018) relies on a trip trigger based on *CEQA Statute & Guidelines* exemptions for the screening threshold for small projects as cited below.

> *Screening Threshold for Small Projects*
>
> *Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day19 generally may be assumed to cause a less-than-significant transportation impact.*[19]
>
> [19] *CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.* (Quote from page 12 of the *Technical Advisory: On Evaluating Transportation Impacts* in CEQA, December 2018).

Two potential limitations of this trigger have been identified. First, the trigger is not tied to a VMT estimate. Second, the trigger does not consider residential land uses. To strengthen the evidence, we used specific California Environmental Quality Act (CEQA) exemptions related to residential projects and 2012 California Household Travel Survey (CHTS) household VMT estimates to develop the following modification to the OPR approach. The CEQA exemption sections are provided below (see the listed items a to c below and yellow highlighted text for minor land use divisions.

> ***15303. NEW CONSTRUCTION OR CONVERSION OF SMALL STRUCTURES***
>
> *Class 3 consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. The numbers of structures described in this section are the maximum allowable on any legal parcel. Examples of this exemption include, but are not limited to:*

(a) One single-family residence, or a second dwelling unit in a residential zone. In urbanized areas, up to three single-family residences may be constructed or converted under this exemption.

(b) A duplex or similar multi-family residential structure, totaling no more than four dwelling units. In urbanized areas, this exemption applies to apartments, duplexes and similar structures designed for not more than six dwelling units.

(c) A store, motel, office, restaurant or similar structure not involving the use of significant amounts of hazardous substances, and not exceeding 2500 square feet in floor area. In urbanized areas, the exemption also applies to up to four such commercial buildings not exceeding 10,000 square feet in floor area on sites zoned for such use if not involving the use of significant amounts of hazardous substances where all necessary public services and facilities are available and the surrounding area is not environmentally sensitive.

***Note**: Authority cited: Section 21083, Public Resources Code; Reference: Sections 21084, Public Resources Code.*

15315. MINOR LAND DIVISIONS

Class 15 consists of the division of property in urbanized areas zoned for residential, commercial, or industrial use into four or fewer parcels when the division is in conformance with the General Plan and zoning, no variances or exceptions are required, all services and access to the proposed parcels to local standards are available, the parcel was not involved in a division of a larger parcel within the previous 2 years, and the parcel does not have an average slope greater than 20 percent.

Note: Authority cited: Sections Section 21083, Public Resources Code; Reference: Section 21084, Public Resources Code.

Based on the 2012 CHTS, here are a range of VMT estimates for 2, 4, and 6 units based on the CA average VMT generation per household.

- CA Average – 41.6 VMT per household
  - 2 units = 83.2 VMT per day
  - 4 units = 166.4 VMT per day
  - 6 units = 249.6 VMT per day (urban areas only)

Another option is to rely on the maximum level of development allowed by CEQA exemptions and convert that value to a 'dwelling unit equivalent' measure similar to impact fee programs. OPR estimated that non-residential uses could generate 110-124 daily trips based on a maximum project exemption size of 10,000 square feet (KSF). Using the lower end of the range and CHTS trip lengths produces a VMT equivalent for 10 KSF for CA of 836, respectively. This equates to about 20 residential households.

Appendix F: VMT Characteristics in the City of Cupertino

External Station Adjustments

Table F-1: External Station Adjustments at Bay Area Regional Boundary

External Station (Connecting County)	Distance (Miles)
SR 1 – Mendocino County	9.4
US 101 – Mendocino County	48.4
SR 29 – Lake County	21.4
I-505 – Yolo County	101.2
SR 113 – Yolo County	12.9
I-80 – Yolo County	39.2
SR 12 – San Joaquin County	No adjustment made to these external station distances because the VTA travel model area incudes San Joaquin County.
SR 4 – San Joaquin County	
I-205 – San Joaquin County	
SR 152 – Merced County	162.9
SR 25 – San Benito County	No adjustment made to these external station distances because the VTA travel model area incudes San Benito County.
US 101 – San Benito County	
SR 152 – Santa Cruz County	No adjustment made to these external station distances because the VTA travel model area incudes Santa Cruz County.
SR 17 – Santa Cruz County	
SR 9 – Santa Cruz County	
SR 1 – Santa Cruz County	

Notes: External station adjustments rounded to nearest tenth of a mile.
Source: California statewide travel demand mode (CSTDM) was used to develop the VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Baseline and Cumulative VMT without External Station Adjustments

Table F-2: Total Project Generated VMT without External Station Adjustments

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change
City of Cupertino[1]			
Total Project Generated VMT (A)	3,113,780	3,656,310	17.4%
Service Population (B)	94,670	117,840	24.5%
Total VMT per Service Population (A/B = C)	32.9	31.0	-5.8%
Santa Clara County[2]			
Total Project Generated VMT (A)	77,470,230	98,923,230	27.7%
Service Population (B)	2,896,760	3,856,430	33.1%
Total VMT per Service Population (A/B = C)	26.7	25.7	-3.7%
Bay Area Region[3]			
Total Project Generated VMT (A)	264,895,020	339,345,620	28.1%
Service Population (B)	11,267,700	14,359,660	27.4%
Total VMT per Service Population (A/B = C)	23.5	23.6	0.4%

Notes: Population and VMT values rounded to nearest 10.

1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Table F-3: Home-Based VMT per Resident without External Station Adjustments

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change
City of Cupertino[1]			
Home-Based VMT (A)	817,200	954,960	16.9%
Residents (B)	59,680	72,740	21.9%
Home-Based VMT per Resident (A/B = C)	13.7	13.1	-4.4%
Santa Clara County[2]			
Home-Based VMT (A)	25,035,830	32,463,680	29.7%
Residents (B)	1,856,250	2,553,720	37.6%
Home-Based VMT per Resident (A/B = C)	13.5	12.7	-5.9%
Bay Area Region[3]			
Home-Based VMT (A)	104,994,970	134,918,730	28.5%
Residents (B)	7,501,730	9,648,460	28.6%
Home-Based VMT per Resident (A/B = C)	14.0	14.0	0%

Notes:
1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Table F-4: Home-Based Work VMT per Employee without External Station Adjustments

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]	Percent Change
City of Cupertino[1]			
Home-Based Work VMT (A)	606,940	802,280	32.2%
Employees (B)	34,990	45,100	28.9%
Home-Based Work VMT per Employee (A/B = C)	17.3	17.8	2.9%
Santa Clara County[2]			
Home-Based Work VMT (A)	17,525,390	22,457,220	28.1%
Employees (B)	1,040,510	1,302,710	25.2%
Home-Based Work VMT per Employee (A/B = C)	16.8	17.2	2.4%
Bay Area Region[3]			
Home-Based Work VMT (A)	57,917,520	75,724,020	30.7%
Employees (B)	3,765,970	4,711,200	25.1%
Home-Based Work VMT per Employee (A/B = C)	15.4	16.1	4.5%

Notes:
1. TAZs included in this summary 86-94, 97-103, 105-136, and 203.
2. TAZs included in this summary 1-1490.
3. TAZs included in this summary 1-2786.
4. Existing Conditions represents 2015 conditions.
5. Cumulative Conditions represents 2040 conditions.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Table F-5: Boundary VMT in Cupertino

Performance Measure	Existing Conditions[4]	Cumulative Conditions[5]
City of Cupertino[1]		
Boundary VMT (A)	1,334,580	1,540,860
Boundary VMT Generated by Cupertino (B)	520,670	597,450
Portion of Boundary VMT Generated by Cupertino (B/A*100 = C)	39.0%	38.8%
Boundary VMT Passing Through Cupertino (D)	813,910	943,410
Portion of Boundary VMT Passing Through Cupertino (D/A*100 = E)	61.0%	61.2%

Notes:
1. Boundary VMT for local streets (including centroid connectors) and freeways within the City of Cupertino.
2. Existing Conditions represents 2015 conditions.
3. Cumulative Conditions represents 2040 conditions.

Source: VTA Travel Model land use summary prepared by Fehr & Peers, 2020.

Appendix G: Comparison of CAPCOA Strategies Versus Research Since 2010

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Comparison of CAPCOA Strategies Versus New Research Since 2010

CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New Information Since CAPCOA Was Published in 2010		
					New information	Change in VMT reduction compared to CAPCOA	Literature or Evidence Cited
Land Use/Location	3.1.1	LUT-1 Increase Density	0.8% - 30% VMT reduction due to increase in density	Adequate	Increasing residential density is associated with lower VMT per capita. Increased residential density in areas with high jobs access may have a greater VMT change than increases in regions with lower jobs access. The range of reductions is based on a range of elasticities from -0.04 to -0.22. The low end of the reductions represents a -0.04 elasticity of demand in response to a 10% increase in residential units or employment density and a -0.22 elasticity in response to 50% increase to residential/employment density.	0.4% -10.75%	Primary sources: Boarnet, M. and Handy, S. (2014). Impacts of Residential Density on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Stevens, M. (2017). Does Compact Development Make People Drive Less? Journal of the American Planning Association, 83(1), 7-18.
Land Use/Location	3.1.9	LUT-9 Improve Design of Development	3.0% - 21.3% reduction in VMT due to increasing intersection density vs. typical ITE suburban development	Adequate	No update to CAPCOA literature; advise applying CAPCOA measure only to large developments with significant internal street structure.	Same	N/A
Land Use/Location	3.1.4	LUT-4 Increase Destination Accessibility	6.7%-20% VMT reduction due to decrease in distance to major job center or downtown	Adequate	Reduction in VMT due to increased regional accessibility (jobs gravity). Locating new development in areas with good access to destinations reduces VMT by reducing trip lengths and making walking, biking, and transit trips more feasible. Destination accessibility is measured in terms of the number of jobs (or other attractions) reachable within a given travel time, which tends to be highest at central locations and lowest at peripheral ones.	0.5%-12%	Primary sources: Handy, S. et al. (2014). Impacts of Network Connectivity on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Handy, S. et al. (2013). Impacts of Regional Accessibility on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Holtzclaw, et al. (2002.) Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and Chicago. Transportation Planning and Technology, Vol. 25, pp. 1–27.

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Comparison of CAPCOA Strategies Versus New Research Since 2010

CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New Information Since CAPCOA Was Published in 2010		
					New information	Change in VMT reduction compared to CAPCOA	Literature or Evidence Cited
Land Use/ Location	3.1.3	LUT-3 Increase Diversity of Urban and Suburban Developments	9%-30% VMT reduction due to mixing land uses within a single development	Adequate	1] VMT reduction due to mix of land uses within a single development. Mixing land uses within a single development can decrease VMT (and resulting GHG emissions), since building users do not need to drive to meet all of their needs. 2] Reduction in VMT due to regional change in entropy index of diversity. Providing a mix of land uses within a single neighborhood can decrease VMT (and resulting GHG emissions), since trips between land use types are shorter and may be accommodated by non-auto modes of transport. For example when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. At the regional level, reductions in VMT are measured in response to changes in the entropy index of land use diversity.	1] 0%-12% 2] 0.3%-4%	1] Ewing, R. and Cervero, R. (2010). Travel and the Built Environment - A Meta-Analysis. Journal of the American Planning Association,76(3),265-294. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Frank, L., Greenwald, M., Kavage, S. and Devlin, A. (2011). An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1. Washington State Department of Transportation. Retrieved from: http://www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf Nasri, A. and Zhang, L. (2012). Impact of Metropolitan-Level Built Environment on Travel Behavior. Transportation Research Record: Journal of the Transportation Research Board, 2323(1), 75-79. Sadek, A. et al. (2011). Reducing VMT through Smart Land-Use Design. New York State Energy Research and Development Authority. Retrieved from: https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-08-29%20Final%20Report_December%202011%20%282%29.pdf Spears, S.et al. (2014). Impacts of Land-Use Mix on Passenger Vehicle Use and Greenhouse Gas Emissions- Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 2] Zhang, Wengia et al. "Short- and Long-Term Effects of Land Use on Reducing Personal Vehicle Miles of Travel."

Comparison of CAPCOA Strategies Versus New Research Since 2010

CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New Information Since CAPCOA Was Published in 2010		
					New information	Change in VMT reduction compared to CAPCOA	Literature or Evidence Cited
Land Use/ Location	3.1.5	LUT-5 Increase Transit Accessibility	0.5%-24.6% reduce in VMT due to locating a project near high-quality transit	Adequate	1] VMT reduction when transit station is provided within 1/2 mile of development (compared to VMT for sites located outside 1/2 mile radius of transit). Locating high density development within 1/2 mile of transit will facilitate the use of transit by people traveling to or from the Project site. The use of transit results in a mode shift and therefore reduced VMT. 2] Reduction in vehicle trips due to implementing TOD. A project with a residential/commercial center designed around a rail or bus station, is called a transit-oriented development (TOD). The project description should include, at a minimum, the following design features: • A transit station/stop with high-quality, high-frequency bus service located within a 5-10 minute walk (or roughly ¼ mile from stop to edge of development), and/or • A rail station located within a 20 minute walk (or roughly ½ mile from station to edge of development) • Fast, frequent, and reliable transit service connecting to a high percentage of regional destinations • Neighborhood designed for walking and cycling	1] 0%-5.8% 2] 0%-7.3%	1] Lund, H. et al. (2004). Travel Characteristics of Transit-Oriented Development in California. Oakland, CA: Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans. Tal, G. et al. (2013). Policy Brief on the Impacts of Transit Access (Distance to Transit) Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/transitaccess/transit_access_brief120313.pdf 2] Zamir, K. R. et al. (2014). Effects of Transit-Oriented Development on Trip Generation, Distribution, and Mode Share in Washington, D.C., and Baltimore, Maryland. Transportation Research Record: Journal of the Transportation Research Board. 2413, 45–53. DOI: 10.3141/2413-05
Land Use/ Location	3.1.6	LUT-6 Integrate Affordable and Below Market Rate Housing	0.04%-1.20% reduction in VMT for making up to 30% of housing units BMR	Weak - Should only be used where supported by local data on affordable housing trip generation.	Observed trip generation indicates substantial local and regional variation in trip making behavior at affordable housing sites. Recommend use of ITE rates or local data for senior housing.	N/A	"Draft Memorandum: Infill and Complete Streets Study, Task 2.1: Local Trip Generation Study." *Measuring the Miles: Developing new metrics for vehicle travel in LA.* City of Los Angeles, April 19, 2017.
Neighborhood Site Enhancements	3.2.1	SDT-1 Provide Pedestrian Network Improvements	0%-2% reduction in VMT for creating a connected pedestrian network within the development and connecting to nearby destinations	Adequate	VMT reduction due to provision of complete pedestrian networks. Only applies if located in an area that may be prone to having a less robust sidewalk network.	0.5%-5.7%	Handy, S. et al. (2014). Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm

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Neighborhood Site Enhancements	3.2.2	SDT-2 Provide Traffic Calming Measures	0.25%-1% VMT reduction due to traffic calming on streets within and around the development	Adequate	Reduction in VMT due to expansion of bike networks in urban areas. Strategy only applies to bicycle facilities that provide a dedicated lane for bicyclists or a completely separated right-of-way for bicycles and pedestrians. Project-level definition: Enhance bicycle network citywide (or at similar scale), such that a building entrance or bicycle parking is within 200 yards walking or bicycling distance from a bicycle network that connects to at least one of the following: at least 10 diverse uses; a school or employment center, if the project total floor area is 50% or more residential; or a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal. All destinations must be 3-mile bicycling distance from project site. Include educational campaigns to encourage bicycling.	0%-1.7%	Zahabi, S. et al. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. Transportation Research Part D: Transport and Environment. 47, 89-103.
Neighborhood Site Enhancements	3.2.3	SDT-3 Implement an NEV Network	0.5%-12.7% VMT reduction for GHG-emitting vehicles, depending on level of local NEV penetration	Weak - not recommended without supplemental data.	Limited evidence and highly limited applicability. Use with supplemental data only.	N/A	City of Lincoln, MHM Engineers & Surveyors, Neighborhood Electric Vehicle Transportation Program Final Report, Issued 04/05/05, and City of Lincoln, A Report to the California Legislature as required by Assembly Bill 2353, Neighborhood Electric Vehicle Transportation Plan Evaluation, January 1, 2008. Cited in: California Air Pollution Control Officers Association. (2010). Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf
Neighborhood Site Enhancements	3.4.9	TRT-9 Implement Car-Sharing Program	0.4% - 0.7% VMT reduction due to lower vehicle ownership rates and general shift to non-driving modes	Adequate	Vehicle trip reduction due to car-sharing programs; reduction assumes 1%-5% penetration rate. Implementing car-sharing programs allows people to have on-demand access to a shared fleet of vehicles on an as-needed basis, as a supplement to trips made by non-SOV modes. Transit station-based programs focus on providing the "last-mile" solution and link transit with commuters' final destinations. Residential-based programs work to substitute entire household based trips. Employer-based programs provide a means for business/day trips for alternative mode commuters and provide a guaranteed ride home option. The reduction shown here assumes a 1%-5% penetration rate.	0.3%-1.6%	Lovejoy, K. et al. (2013). Impacts of Carsharing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm *Need to verify with more recent UCD research.*

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Parking Pricing	3.3.1	PDT-1 Limit Parking Supply	5%-12.5% VMT reduction in response to reduced parking supply vs. ITE parking generation rate	Weak - not recommended. Fehr & Peers has developed new estimates for residential land use only that may be used.	CAPCOA reduction range derived from estimate of reduced vehicle ownership, not supported by observed trip or VMT reductions. Evidence is available for mode shift due to presence/absence of parking in high-transit urban areas; additional investigation ongoing	Higher	Fehr & Peers estimated a linear regression formula based on observed data from multiple locations. Resulting equation produces maximum VMT reductions for residential land use only of 30% in suburban locations and 50% in urban locations based on parking supply percentage reductions.
Parking Pricing	3.3.2	PDT-2 Unbundle Parking Costs from Property Cost	2.6% -13% VMT reduction due to decreased vehicle ownership rates	Adequate - conditional on the agency not requiring parking minimums and pricing/managing on-street parking (i.e., residential parking permit districts, etc.).	Reduction in VMT, primarily for residential uses, based on range of elasticities for vehicle ownership in response to increased residential parking fees. Does not account for self-selection. Only applies if the city does not require parking minimums and if on-street parking is priced and managed (i.e., residential parking permit districts).	2%-12%	Victoria Transport Policy Institute (2009). Parking Requirement Impacts on Housing Affordability. Retrieved March 2010 from: http://www.vtpi.org/park-hou.pdf.
Parking Pricing	3.3.3	PDT-3 Implement Market Price Public Parking	2.8%-5.5% VMT reduction due to "park once" behavior and disincentive to driving	Adequate	Implement a pricing strategy for parking by pricing all central business district/employment center/retail center on-street parking. It will be priced to encourage park once" behavior. The benefit of this measure above that of paid parking at the project only is that it deters parking spillover from project supplied parking to other public parking nearby, which undermine the vehicle miles traveled (VMT) benefits of project pricing. It may also generate sufficient area-wide mode shifts to justify increased transit service to the area. VMT reduction applies to VMT from visitor/customer trips only. Reductions higher than top end of range from CAPCOA report apply only in conditions with highly constrained on-street parking supply and lack of comparably-priced off-street parking.	2.8%-14.5%	Clinch, J.P. and Kelly, J.A. (2003). Temporal Variance Of Revealed Preference On-Street Parking Price Elasticity. Dublin: Department of Environmental Studies, University College Dublin. Retrieved from: http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf. Cited in Victoria Transport Policy Institute (2017). Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Hensher, D. and King, J. (2001). Parking Demand and Responsiveness to Supply, Price and Location in Sydney Central Business District. Transportation Research A. 35(3), 177-196. Millard-Ball, A. et al. (2013). Is the curb 80% full or 20% empty? Assessing the impacts of San Francisco's parking pricing experiment. Transportation Research Part A. 63(2014), 76-92. Shoup, D. (2011). The High Cost of Free Parking. APA Planners Press. p. 290. Cited in Pierce, G. and Shoup, D. (2013). Getting the Prices Right. Journal of the American Planning Association. 79(1), 67-81.
Transit System	3.5.3	TST-3 Expand Transit Network	0.1-8.2% VMT reduction in response to increase in transit network coverage	Adequate	Reduction in vehicle trips due to increased transit service hours or coverage. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.1%-10.5%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm

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Transit System	3.5.4	TST-4 Increase Transit Service Frequency/Speed	0.02%-2.5% VMT reduction due to reduced headways and increased speed and reliability	Adequate	Reduction in vehicle trips due to increased transit frequency/decreased headway. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.3%-6.3%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Transit System	3.5.1	TST-1 Provide a Bus Rapid Transit System	0.02%-3.2% VMT reduction by converting standard bus system to BRT system	Adequate	No new information identified.	Same	N/A
Commute Trip Reduction	3.4.1	TRT-1 Implement CTR Program - Voluntary	1.0%-6.2% commute VMT reduction due to employer-based mode shift program	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-2 Implement CTR Program - Required Implementation/Monitoring" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.	Reduction in vehicle trips in response to employer-led TDM programs. The CTR program should include all of the following to apply the effectiveness reported by the literature: • Carpooling encouragement • Ride-matching assistance • Preferential carpool parking • Flexible work schedules for carpools • Half time transportation coordinator • Vanpool assistance • Bicycle end-trip facilities (parking, showers and lockers)	1.0%-6.0%	Boarnet, M. et al. (2014). Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.2	TRT-2 Implement CTR Program - Required Implementation/Monitoring	4.2%-21.0% commute VMT reduction due to employer-based mode shift program with required monitoring and reporting	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.	Limited evidence available. Anecdotal evidence shows high investment produces high VMT/vehicle trip reductions at employment sites with monitoring requirements and specific targets.	Same	Nelson/Nygaard (2008). South San Francisco Mode Share and Parking Report for Genentech, Inc.(p. 8) Cited in: California Air Pollution Control Officers Association. (2010). Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf
Commute Trip Reduction	3.4.4	TRT-4 Implement Subsidized or Discounted Transit Program	0.3%-20% commute VMT reduction due to transit subsidy of up to $6/day	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	1] Reduction in vehicle trips in response to reduced cost of transit use, assuming that 10-50% of new bus trips replace vehicle trips; 2] Reduction in commute trip VMT due to employee benefits that include transit 3] Reduction in all vehicle trips due to reduced transit fares system-wide, assuming 25% of new transit trips would have been vehicle trips.	1] 0.3%-14% 2] 0-16% 3] 0.1% to 6.9%	1] Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm 2] Carolina, P. et al. (2016). Do Employee Commuter Benefits Increase Transit Ridership? Evidence rom the NY-NJ Region. Washington, DC: Transportation Research Board, 96th Annual Meeting. 3] Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.15	TRT-15 Employee Parking Cash-Out	0.6%-7.7% commute VMT reduction due to implementing employee parking cash-out	Weak - Effectiveness is building/tenant specific. Research data is over 10 years old (1997).	Shoup case studies indicate a reduction in commute vehicle trips due to implementing cash-out without implementing other trip-reduction strategies.	3%-7.7%	Shoup, D. (1997). Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies. Transport Policy. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/research/apr/past/93-308a.pdf. This citation was listed as an alternative literature in CAPCOA.

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Commute Trip Reduction	3.4.14	TRT-14 Price Workplace Parking	0.1%-19.7% commute VMT reduction due to mode shift	Adequate - Effectiveness is building/tenant specific.	Reduction in commute vehicle trips due to priced workplace parking; effectiveness depends on availability of alternative modes. Workplace parking pricing may include: explicitly charging for parking, implementing above market rate pricing, validating parking only for invited guests, not providing employee parking and transportation allowances, and educating employees about available alternatives.	0.5%-14%	Primary sources: Concas, S. and Nayak, N. (2012), A Meta-Analysis of Parking Price Elasticity. Washington, DC: Transportation Research Board, 2012 Annual Meeting. Dale, S. et al. (2016). Evaluating the Impact of a Workplace Parking Levy on Local Traffic Congestion: The Case of Nottingham UK. Washington, DC: Transportation Research Board, 96th Annual Meeting. Secondary sources: Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Spears, S. et al. (2014). Impacts of Parking Pricing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.6	TRT-6 Encourage Telecommuting and Alternative Work Schedules	0.07%-5.5% commute VMT reduction due to reduced commute trips	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	VMT reduction due to adoption of telecommuting. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks.	0.2%-4.5%	Handy, S. et al. (2013). Policy Brief on the Impacts of Telecommuting Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/telecommuting/telecommuting_brief120313.pdf
Commute Trip Reduction	3.4.7	1] TRT-7 Implement CTR Marketing 2] Launch Targeted Behavioral Interventions	0.8%-4.0% commute VMT reduction due to employer marketing of alternatives	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	1] Vehicle trips reduction due to CTR marketing; 2] Reduction in VMT from institutional trips due to targeted behavioral intervention programs	1] 0.9% to 26% 2] 1%-6%	1] Pratt, Dick. Personal communication regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies. Transit Cooperative Research Program. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Dill, J. and Mohr, C. (2010). Long-Term Evaluation of Individualized Marketing Programs for Travel Demand Management. Portland, OR: Transportation Research and Education Center (TREC). Retrieved from: http://pdxscholar.library.pdx.edu/usp_fac 2] Brown, A. and Ralph, K. (2017.) "The Right Time and Place to Change Travel Behavior: An Experimental Study." Washington, DC: Transportation Research Board, 2017 Annual Meeting. Retrieved from: https://trid.trb.org/view.aspx?id=1437253
Commute Trip Reduction	3.4.11	TRT-11 Provide Employer-Sponsored Vanpool/Shuttle	0.3%-13.4% commute VMT reduction due to employer-sponsored vanpool and/or shuttle service	Adequate - Effectiveness is building/tenant specific.	1] Reduction in commute vehicle trips due to implementing employer-sponsored vanpool and shuttle programs; 2] Reduction in commute vehicle trips due to vanpool incentive programs; 3] Reduction in commute vehicle trips due to employer shuttle programs	1] 0.5%-5.0% 2] 0.3%-7.4% 3] 1.4%-6.8%	1] Concas, Sisinnio, Winters, Philip, Wambalaba, Francis, (2005). Fare Pricing Elasticity, Subsidies, and Demand for Vanpool Services. Transportation Research Record: Journal of the Transportation Research Board, 1924, pp 215-223. 2] Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm 3] ICF. (2014). GHG Impacts for Commuter Shuttles Pilot Program.

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Commute Trip Reduction	3.4.3	TRT-3 Provide Ride-Sharing Programs	1%-15% commute VMT reduction due to employer ride share coordination and facilities	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Commute vehicle trips reduction due to employer ride-sharing programs. Promote ride-sharing programs through a multi-faceted approach such as: • Designating a certain percentage of parking spaces for ride sharing vehicles • Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles • Providing an app or website for coordinating rides	2.5%-8.3%	Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm
Commute Trip Reduction	3.4.10	TRT-10 Implement a School Pool Program	7.2%-15.8% reduction in school VMT due to school pool implementation	Adequate - School VMT only.	Limited new evidence available, not conclusive	Same	Transportation Demand Management Institute of the Association for Commuter Transportation. TDM Case Studies and Commuter Testimonials. Prepared for the US EPA. 1997. (p. 10, 36-38) WayToGo 2015 Annual Report. Accessed on March 12, 2017 from http://www.waytogo.org/sites/default/files/attachments/waytogo-annual-report-2015.pdf
Commute Trip Reduction	3.4.13	TRT-13 Implement School Bus Program	38%-63% reduction in school VMT due to school bus service implementation	Adequate - School VMT only.	VMT reduction for school trips based on data beyond a single school district. School district boundaries are also a factor to consider. VMT reduction does not appear to be a factor that was considered in a select review of CA boundaries. VMT reductions apply to school trip VMT only.	5%-30%	Wilson, E., et al. (2007). The implications of school choice on travel behavior and environmental emissions. Transportation Research Part D: Transport and Environment 12(2007), 506-518.

Appendix H: VMT Mitigation Through Banks and Exchanges: Understanding New Mitigation Approaches

APPENDIX H

APRIL 2020 | FINAL

VMT Mitigation Through Fees, Banks, & Exchanges

UNDERSTANDING NEW MITIGATION APPROACHES

A WHITE PAPER PREPARED BY

FEHR & PEERS

WRCOG
Western Riverside Council of Governments

VMT MITIGATION THROUGH FEES, BANKS, AND EXCHANGES

Understanding New Mitigation Approaches

BACKGROUND

On September 27, 2013, Governor Jerry Brown signed SB 743 into law and started a process intended to fundamentally change transportation impact analysis as part of CEQA compliance. These changes include elimination of *auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion* as a basis for determining significant impacts. Instead, transportation impacts will be determined based on changes to vehicle miles of travel (VMT). ***This change essentially shifts the focus of analysis from impacts to drivers through higher delays to the impact of driving itself***.

Lead agencies making the transition to VMT are realizing the challenges of using the new metric especially when it comes to mitigating significant VMT impacts. Reducing VMT from land use projects and land use plans has traditionally been accomplished through transportation demand management (TDM) strategies. These strategies include modifying a project's land use characteristics (i.e., density) and incorporating vehicle trip reduction programs at the site to change travel behavior of tenants and visitors. TDM is most effective in urban areas where the site is accessible by multiple travel modes (i.e., walking, bicycling, transit, and vehicle) offering similar travel times and convenience. Conversely, TDM strategies are less effective in lower density suburban and rural areas where modes are limited to personal vehicles. In both areas though, a program-based approach to mitigation can be more effective than project-site strategies. Programs can pool development mitigation contributions to pay for larger and more effective VMT reduction strategies that are not be feasible for individual projects. This paper outlines and compares multiple program types and then explains the implementation steps and key governance issues.

PROGRAM CONCEPTS

The concept of a 'program' approach to impact mitigation is not new and has been used for a variety of technical subjects including transportation, air quality, greenhouse gases, and habitat. Transportation impact fee programs have been used to help mitigate cumulative level of service (LOS) impacts. What is new are how to use impact fee programs for VMT impacts and alternative programs called mitigation exchanges and banks. Absent new program-level mitigation options, suburban and rural lead agencies will have limited feasible mitigation options for project sites.

For CEQA purposes, feasible means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

- CEQA Guidelines Section 15364

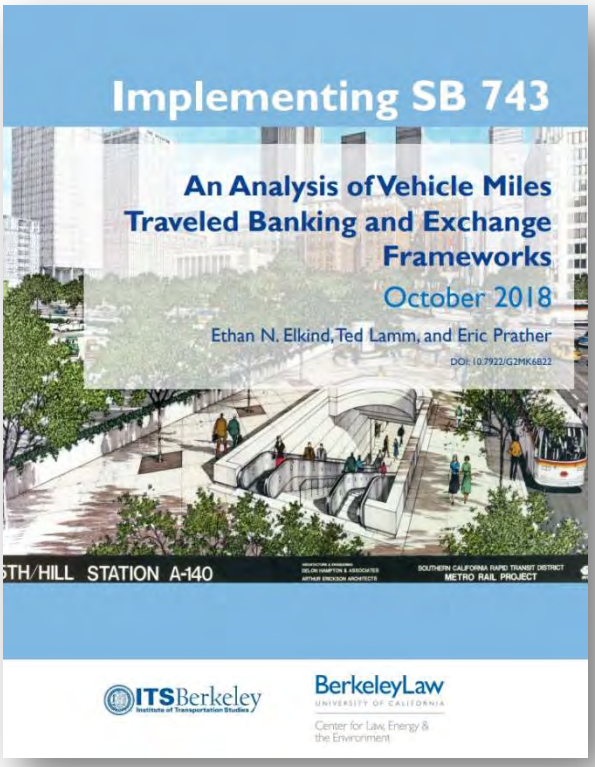
Without feasible mitigation, significant VMT impacts would be significant and unavoidable (SAU). Under these circumstances a project must prepare an environmental impact report (EIR) adding extra time and cost to environmental review compared to a negative declaration (ND). Program-based approaches may be able to overcome the limitation of project-site only mitigation. Three specific concepts as described below have been identified for the purposes of this white paper.

- **VMT-based Transportation Impact Fee program (VMT-TIF)** – The first program concept is a traditional impact fee program in compliance with the mitigation fee act. The nexus for the fee program would be a VMT reduction goal consistent with the CEQA threshold established by a lead agency for SB 743 purposes. The City of LA is the first in California to complete a nexus study for this type of program. The main difference from a fee program based on a metric such as vehicle level of service (LOS) is that the VMT reduction nexus results in a capital improvement program (CIP) consisting largely of transit, bicycle, and pedestrian projects. These types of fee programs are time consuming to develop, monitor, and maintain but are recognized as an acceptable form of CEQA mitigation if they can demonstrate that the CIP projects will be fully funded and implemented.

- **VMT Mitigation Exchange** – In simple terms, the exchange concept relies on a developer agreeing to implement a predetermined VMT reducing project or proposing a new one. The project may be located in the vicinity of the project or elsewhere in the community, and possibly outside the community. The exchange needs to have a facilitating entity that can match the VMT generator (the development project) with a VMT reducing project or action. The facilitating entity could be the lead agency or another entity that has the ability to provide the match and to ensure through substantial evidence that the VMT reduction is valid. A key unknown with this approach is the time period for VMT reduction. For example, how many years of VMT reduction are required to declare a VMT impact less than significant?

- **VMT Mitigation Bank** – A mitigation bank attempts to create a monetary value for VMT reduction such that a developer could purchase VMT reduction credits. The money exchanged for credits could be applied to local, regional, or state level VMT reduction projects or actions. Like all VMT mitigation, substantial evidence would be necessary that the projects covered by the bank would achieve expected VMT reductions and some form of monitoring may be required. This is more complicated than a simple exchange and would require more time and effort to set up and implement. The verification of how much VMT reduction is associated with each dollar or credit would be one of the more difficult parts of the program.

With both exchanges and banks, another important test is that the VMT reduction would not have occurred otherwise such that mitigation program creates 'additionality'. This means that additional VMT reduction will occur above and beyond what would have occurred without the program. A commonly accepted definition of 'additionality' has not yet been developed. One possible test of additionality is that the mitigation project is not included in the regional transportation plan (RTP). The RTP is a financially constrained plan so projects not included in the plan would not likely have been implemented within the typical cumulative timeframe.



https://www.law.berkeley.edu/research/clee/research/climate/transportation/vehicle-miles-traveled/

For any program to qualify as a CEQA mitigation program, the discretionary action to adopt the program may require CEQA review. This conclusion is based on the *California Native Plant Society v. County of El Dorado* where the court found that payment of fee does not presumptively establish full mitigation of a discretionary project. A separate CEQA review of the program is necessary to satisfy the 'duty to mitigate' imposed by CEQA. Decision makers should also realize that absent a VMT reduction program, developers would likely be limited to only project site mitigation. While this may be less effective, it also lowers their mitigation costs because the available and feasible mitigation would be more limited.

More details about exchanges and banks are explained in the framework document shown above and available at the cited web link. This white paper expands on the framework to accomplish two objectives. The first objective is to compare the pros and cons of exchanges and banks to a traditional impact fee program. Since impact fee programs have already been established as feasible CEQA mitigation, they serve as a benchmark against which to compare other program concepts. The second objective is to outline the implementation steps associated with creating an exchange or bank to help identify key implementation questions or issues that could affect their feasibility.

PROGRAM ASSESSMENT (Pros/Cons)

Table 1 below outlines the pros and cons of approach VMT mitigation through an impact fee program, exchange, or bank. This assessment is intended to highlight some of the key differences between each program concept.

Table 1 – VMT Mitigation Program Type Comparison

Program Type	Pros	Cons
Impact Fee Program	• Common and accepted practice • Accepted for CEQA mitigation • Adds certainty to development costs • Allows for regional scale mitigation projects • Increases potential VMT reduction compared to project site mitigation only	• Time consuming and expensive to develop and maintain • Requires strong nexus • Increases mitigation costs for developers because it increases feasible mitigation options • Limited to jurisdictional boundary unless a regional authority is created • Uncertainty about feasibility and strength of nexus relationship between VMT and pedestrian, bicycle, and transit projects (especially in suburban/rural jurisdictions)
Mitigation Exchange	• Limited complexity • Reduced nexus obligation • Expands mitigation to include costs for programs, operations, and maintenance • Allows for regional scale mitigation projects • Allows for mitigation projects to be in other jurisdictions • Increases potential VMT reduction compared to project site mitigation only	• Requires 'additionality' • Potential for mismatch between mitigation need and mitigation projects • Increases mitigation costs for developers because it increases feasible mitigation options • Unknown timeframe for mitigation life • Effectiveness depends on scale of the program
Mitigation Bank	• Adds certainty to development costs • Allows for regional scale projects • Allows for mitigation projects to be in other jurisdictions • Allows regional or state transfers	• Requires 'additionality' • Time consuming and expensive to develop and maintain • Requires strong nexus • Political difficulty distributing mitigation dollars/projects

Table 1 – VMT Mitigation Program Type Comparison		
Program Type	**Pros**	**Cons**
	• Expands mitigation options to include costs for programs, operations, and maintenance • Increases potential VMT reduction compared to project site mitigation only	• Increases mitigation costs for developers because it increases feasible mitigation options • Unknown timeframe for mitigation life • Effectiveness depends on scale of the program

To better understand potential program differences, Table 2 contains a comparison of the VMT mitigation projects or actions that each program type could fund or implement. The information for an impact fee program is more certain than for exchanges or banks. Fee programs have been used in practice for decades and have been vetted through court decisions. While banks and exchanges do exist for other environmental mitigation purposes such as wetlands preservation and habitat conservation, these applications have largely focused on protecting fixed land amounts versus reducing a metric that fluctuates over time and may vary in value depending on economic conditions.

Table 2 –VMT Mitigation Projects and Actions Comparison	
Program Structure	**Project Types that Reduce VMT**
Impact Fee Program	• Pedestrian network expansion • Bicycle/Scooter network expansion (includes bike/scooter share stations) • Transit vehicles or facilities associated with service expansion • Roadway gap closures that reduce trip lengths (bridges)
Mitigation Exchange	• All impact fee program project types • Private or institutional projects that reduce VMT • Transit service improvements and transit pass subsidies
Mitigation Bank	• All impact fee program project types • All mitigation exchange project types • VMT reduction strategies associated with travel behavior changes

IMPLEMENTATION STEPS

This section addresses the second objective noted above to outline the implementation steps associated with creating an exchange or bank to help identify key implementation questions or issues that could affect their feasibility. The starting point for these steps begins with identifying the potential statutory or legal requirements that could govern or influence program creation. These are highlighted in Table 3 and build on the research previously done by U.C. Berkeley in the document referenced above. Since specific statutes do not exist specific to VMT exchanges and banks, U.C. Berkeley used a proxy based on conservation programs established under the California Fish & Game code. This is a reasonable proxy given that the intent behind VMT exchanges and banks is a form of conservation. Instead of habitat, VMT exchanges and banks are trying to conserve vehicle trip making and the VMT generated through this activity. VMT mitigation banks or exchanges do not appear to require new legislative authority but as noted in the U.C. Berkeley document, having state-wide templates for their development could help establish clear standards and expectations for program designs.

Table 3 – Potential VMT Mitigation Exchange/Bank Legal Requirements

Program Type/Legal Requirements	Statutory Reference
Transportation Impact Fee Program	
1. Mitigation Fee Act – Intended to create a program that allows individual development projects to pay for all or portion of the cost to implement public facilities necessary to support the project. Public facilities are generally limited to capital projects. The nexus study for the program must demonstrate how there is a reasonable relationship between the following. • How there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed. • How there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed. • How there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed. The fees may not be applied to existing deficiencies or the maintenance and operation of an improvement. As such, clear standards should exist about the physical and operational performance expectations for each model of travel included in the program.	• California Government Code §66000-66001

Table 3 – Potential VMT Mitigation Exchange/Bank Legal Requirements	
Program Type/Legal Requirements	**Statutory Reference**
2. Constitutional – Court decisions have placed limits on what level of mitigation can be expected of land use development projects. The limits largely require a nexus between the mitigation and a legitimate government interest plus a rough proportionality between the mitigation and the adverse impact caused by the project.	• Nollan v. California Coastal Commission, 483 U.S. 825 (1987) • Dolan v. City of Tigard, 512 U.S. 374 (1994)
3. CEQA – For mitigation to be imposed, a significant impact must occur. Impacts stem from changes to the baseline environment caused by the project. The significance of those impacts is determined by the lead agencies choice of thresholds. This limits mitigation to increment of VMT change that occurs above the threshold.	• CEQA Statute (CA Public Resources Code 21000-21189) • CEQA Guidelines (CA Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387)
VMT Mitigation Exchange or Bank	
1. An explanation of the VMT mitigation purpose of and need for the bank or exchange.	• Fish & Game Code §1852(c)(1)
2. The geographic area covered by the bank or exchange and rationale for the selection of the area, together with a description of the existing transportation and development dynamics that provide relevant context for the development of the bank or exchange.	•§1852(c)(2)
3. The public transit and VMT reduction opportunities currently located within the bank or exchange area.	•§1852(c)(3)
4. Important residential and commercial communities and transportation resources within the bank or exchange area, and an explanation of the criteria, data, and methods used to identify those important communities and resources.	•§1852(c)(4)
5. A summary of historic, current, and projected future transportation stressors and pressures in the bank or exchange area, including economic, population growth and development trends.	•§1852(c)(5-6)
6. Provisions ensuring that the bank or exchange will comply with all applicable state and local legal and other requirements and does not preempt the authority of local agencies to implement infrastructure and urban development in local general plans.	•§1852(c)(7)
7. VMT mitigation goals and measurable objectives for regional transportation resources and important mitigation elements identified in the plan that address or respond to the identified stressors and pressures on transportation within the bank or exchange area.	•§1852(c)(8)

Table 3 – Potential VMT Mitigation Exchange/Bank Legal Requirements	
Program Type/Legal Requirements	**Statutory Reference**
8. VMT mitigation projects, including a description of specific projects that, if implemented, could achieve the mitigation goals and objectives, and a description of how the mitigation projects were prioritized and selected in relation to the mitigation goals and objectives.	•§1852(c)(9)
9. Provisions ensuring that the bank or exchange plan is consistent with and complements any local, regional or federal transportation or congestion management plan that overlaps with the bank or exchange area, a summary of any such plans, and an explanation of such consistency.	•§1852(c)(10-11)
Sources: Implementing SB 743 An Analysis of Vehicles Miles Traveled Banking and Exchange Frameworks, October 2018, Institute of Transportation Studies, U.C. Berkeley. 2019 California Environmental Quality Act (CEQA) Statute & Guidelines, Association of Environmental Professionals, 2019. http://leginfo.ca.gov/ http://ccr.oal.ca.gov/	

A review of these potential legal requirements suggests that the creation of an exchange or a bank may not be less rigorous than that of a conventional transportation impact fee program. These legal requirements combined with the need to demonstrate additionality and provide verification could create implementation costs beyond those of a conventional transportation impact fee program. To explore this issue further, annotated flow charts were developed for each program concept. These flow charts are presented on the following pages and allow a reviewer to quickly surmise the differences and similarities associated with creating, operating, and maintaining these programs.

Mitigating VMT Impacts Under SB 743

FEHR PEERS

VMT Bank

Implementation

Considerations

Procedural Flowchart

Step 1
Determine Scale/Scope

There are advantages and disadvantages to creating a Bank with a larger scale/scope. However, multiple agencies must be willing to accept the Bank's mitigation options for a state or regional Bank to be feasible. Larger regions can:

*Decrease costs associated with running the Bank
*Decrease local authority over mitigation options
*Increase efficiency and effectiveness of the program

Step 2
Determine Sponsor

There are a few organizational components to consider when creating a mitigation Bank. These elements include:

*Administrative - The Bank must perform several administrative functions such as collecting fees, managing information, answering questions, and other business operations.

*Technical - There is a significant amount of technical work needed to initially and continually prove the mitigation options reduce VMT and that the reductions would not have occurred without the programs. The Bank also needs to show the fees it receives are related and proportional to new development.

*Accounting - The Bank requires a thorough accounting system to track collected fees and to ensure fees are being handled according to CEQA and other legal guidelines. This includes payments for implementing VMT reduction projects.

Agencies should consider their ability to perform these roles when deciding whether the Bank should be run internally or by a third party.

Step 3
Formally Establish Bank & Review Team

The entity creating the Bank must legally formalize its creation. If the intent is for the Bank to be used by multiple agencies, this may require a joint powers authority or equivalent.

A review team should be used to verify the effectiveness of mitigation options based on substantial evidence. This team could be internal to the entity creating the bank or an independent third party.

Potential third party entities that could function as a review team include public agencies such as those listed below.

*Caltrans - local office
*ARB
*CalEPA

Step 4
Determine & Prioritize Mitigation Options

The Bank Sponsor creates a list of mitigation options. The Review Team evaluates the list to ensure it complies with relevant requirements. The Sponsor should consider the following elements when prioritizing options:
*Equity
*Timeliness of Implementation
*Cost

Mitigation options can include:
*Infrastructure projects
*Programs/incentives (Unlike infrastructure projects, programs/incentives are ongoing activities. Because programs/incentives must be continually maintained to be effective, agencies should consider if developers must pay for them indefinitely.

Step 5
Administer Bank

The public agency or entity sponsoring a Bank may not always be the lead agency on a project. In this situation the Sponsor should develop an agreement with the lead agency that allows the Bank's mitigation options to be considered an acceptable mitigation measure for the EIR.

Banks must continue to prove that their mitigation options reduce VMT and that the reduction would not have occurred without the projects/programs.

CEQA review of the Exchange creation may be required to be considered as a formal mitigation program.

Mitigating VMT Impacts Under SB 743

FEHR PEERS

VMT Exchange

Implementation

Considerations

Procedural Flowchart

Step 1
Determine Scale/Scope

To create a regional program requires all participating agencies to adopt the program. Programs with larger scopes can:

*Decrease administrative costs
*Decrease local authority
*Increase efficiency and effectiveness of the program

Step 2
Determine Sponsor

The organizational components of a mitigation Exchange will depend on the type of sponsor (public or private) mitigation options, and matching process between mitigation options and projects.

Step 3
Determine & Propose Mitigation Options

If the sponsor is a public agency, they will develop a list of options developers can choose from to mitigate the VMT generated by their development.

If the developer wants to propose their own mitigation Exchange, they must get it approved by the sponsor and lead agency.

Step 4
Develop Review Team

The Exchange should have a Review Team to verify mitigation effectiveness and additionality based on substantial evidence. The team could consist of third-party representatives. The team reviews the mitigation list and verifies that the options reduce VMT and that the reductions would not have occurred without the project, program, or incentive.

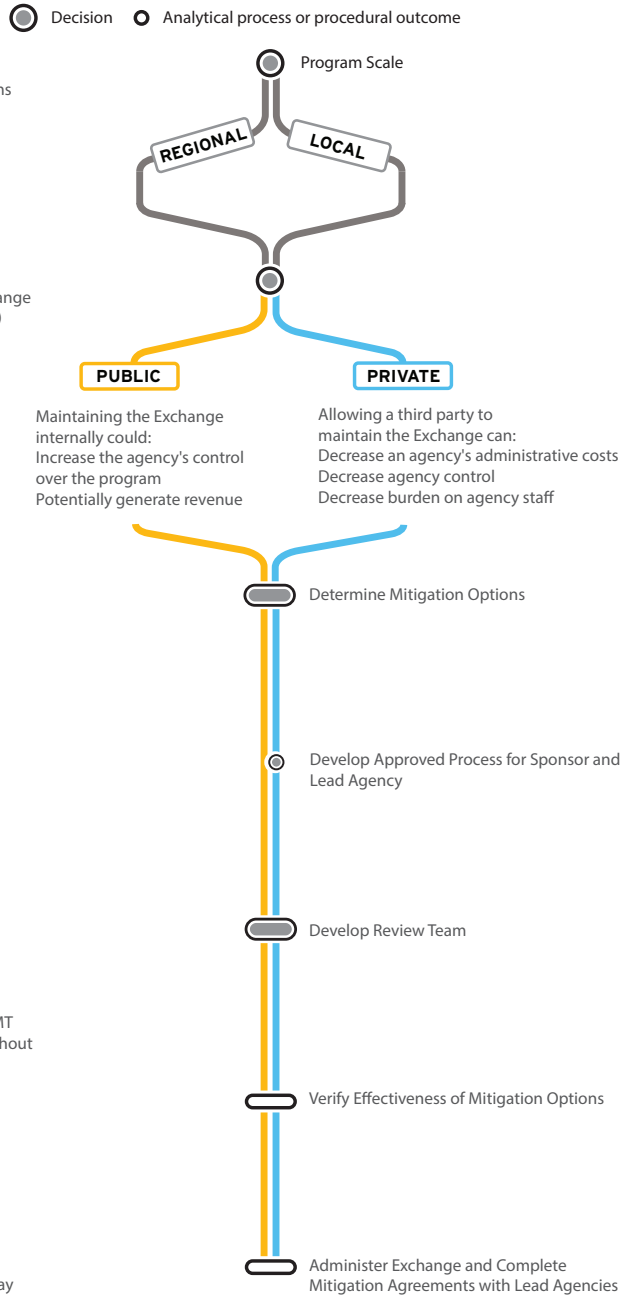
Because Exchanges can include programs/incentives as mitigation options, the Review Team must continually evaluate them to ensure the options are still effective and determine to what degree they reduce VMT.

Step 5
Administer Exchange

The public agency/entity sponsoring an Exchange may not always be the lead agency on a project. In this situation the Sponsor should develop an agreement with the lead agency that allows the Exchange's mitigation options to be considered an acceptable mitigation measure for the EIR.

Exchanges must continue to prove that their mitigation options reduce VMT and that the reduction would not have occurred without the projects/programs.

CEQA review of the Exchange creation may be required to be considered as a formal mitigation program.



Mitigating VMT Impacts Under SB 743

FEHR & PEERS

VMT Impact Fee

Implementation

Step 1
Determine Scale/Scope

Step 2
Determine Nexus (VMT)

Step 3
Determine & Propose Mitigation Options

Step 4
Prepare & Approve Nexus Study

Step 5
Prepare & Adopt Fee Ordinance

Step 6
Complete CEQA Review for the Program

Step 7
Administer the Program

Considerations

To create a regional program requires all participating agencies to adopt the program. Programs with larger scopes:

*Decrease administrative costs
*Decrease local authority
*Increase efficiency and effectiveness of the program

An agency must determine its VMT reduction goal before it can show the relationship between new development and that goal.

The CIP develops a list of capital improvement projects necessary to reduce VMT consistent with its desired goal. The agency should prioritize the projects so they are constructed in a logical order.

The prioritization process should consider:
*Equity
*Timeliness
*Cost
*Modal Preference (Walking/Biking/Transit)
*Stakeholder/Community Input

Agencies must demonstrate that the projects in the fee program contribute to VMT reduction. The agency must also show that the fees are related and proportional to new development.

Fees should take into account the delay in the time when fees are collected and when they are used.

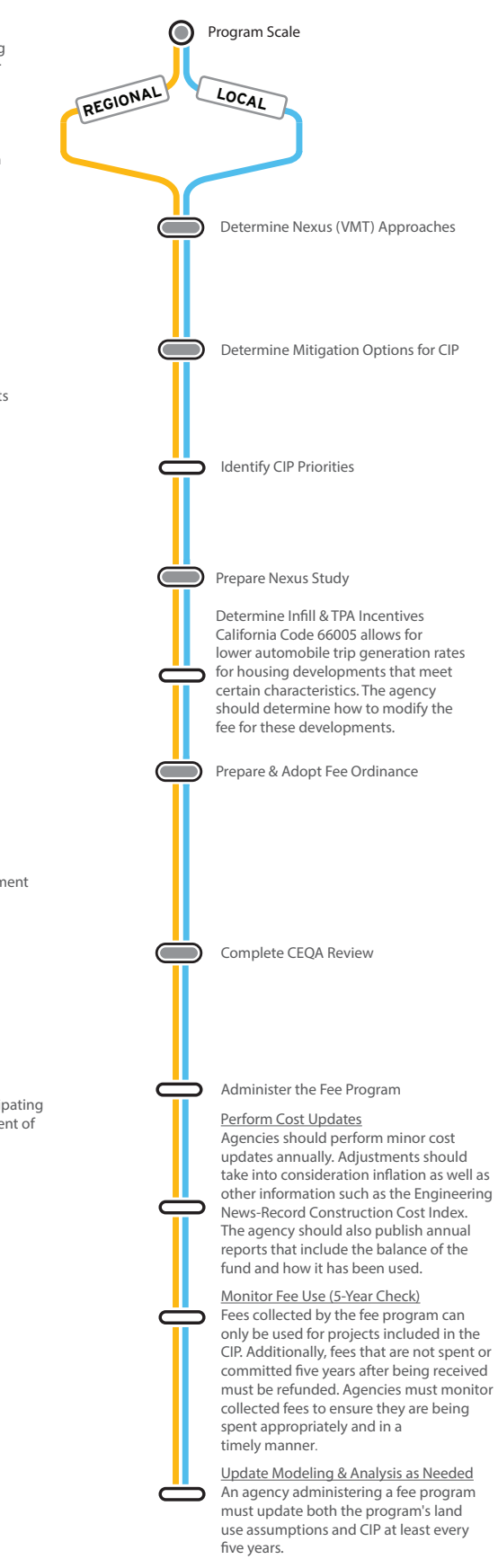
For a fee to be regularly imposed, it must be adopted as an ordinance.

The ordinance must include:
*Reason for the fee
*The relationship between the fee and new development
*Methodology used in developing the fee
*Projects to be included in the CIP

California courts have ruled that in order for a fee program to serve as acceptable CEQA mitigation, the program itself must first be reviewed in an EIR.

For Regional Impact Fee Programs ensure that participating agencies have adopted the program such that payment of fees is considered a feasible mitigation measure.

Procedural Flowchart



PROGRAM EXAMPLES

To help explain the different program types, it may be useful to consider some examples. The existing programs below range from an existing VMT-based impact fee program to programs that could be evolved into VMT mitigation banks or exchanges.

City of Los Angeles Westside Mobility Plan Transportation Impact Fee Program

(https://planning.lacity.org/eir/CoastalTrans/deir/pdfs/tiafeestudy.pdf)

The City of Los Angeles developed the first impact fee program that relies on a VMT reduction nexus. The westside previously relied on LOS-based impact fee programs but as the area matured and new laws like SB 743 emerged, the City chose to shift their nexus. This shift changed the nature of the CIP from largely roadway capacity expansion projects to more transit, bicycle, and pedestrian infrastructure projects. A key benefit of this approach as noted above is that once the fee program is in place, administration of the program is limited to construction cost updates and complying with state reviews to ensure that funding is being appropriately used to construct and implement the CIP projects. No further verification of CIP effectiveness is required.

WRCOG Transportation Uniform Mitigation Fee (TUMF) Program

(http://www.wrcog.cog.ca.us/174/TUMF)

Western Riverside County has the Transportation Uniform Mitigation Fee (TUMF) Program, implemented in 2003. While this program is tied to a vehicle LOS nexus, the foundation and structure of the program could be used to create a new VMT impact fee program similar to the Los Angeles example. The following summary describes the foundational elements of the TUMF and provides information about how to evolve the program for VMT impact mitigation purposes.

The TUMF funds critical county-wide transportation infrastructure to accommodate the traffic created by new population growth and commercial development throughout western Riverside County. It is a vital funding source that complements Federal, State, and local funding funds for improvements to roadways, interchanges, and transit facilities. The fee is uniformly assessed on new residential and non-residential development throughout the WRCOG region. Each of WRCOG's member jurisdictions and the March Joint Powers Authority (JPA) participate in the program.

WRCOG serves as the Program Administrator and has three main responsibilities. First, WRCOG leads the development of regular AB 1600 compliant Nexus Studies. These Studies identify needed the transportation facilities to be funded by the fee, identify future growth projections, and set the resulting

fee, which is then adopted by WRCOG's Executive Committee. The transportation projects included in the Nexus Study are identified through a collaborative process in which jurisdictions submit projects for consideration, which are then subject to an analysis process to verify that they meet applicable criteria. These two-step process ensures that the projects included in the Nexus Study reflect both local input and regional need. A similar process could be used to create a VMT reduction nexus and to select VMT reducing projects for either a separate VMT impact fee program or a modified TUMF that includes projects to achieve LOS and VMT reduction goals.

WRCOG's second responsibility is the collection and calculation of fees. WRCOG has developed a set of consistent fee calculation tools, which ensure that TUMF is calculated on a consistent basis for all projects, regardless of their location. Because there is a regional Nexus Study and a consistent fee calculation approach, WRCOG ensures that all projects of the same type pay the same fee, regardless of their location. In 2019, WRCOG completed work on an online fee payment system which expedites fee payments from project applicants.

The final responsibility of WRCOG is distributing funds collected from each agency and using those monies to fund transportation projects. Project identification and prioritization is led by the local agencies who meet to decide how much funding to provide to each project. Local agencies are grouped into geographic sub areas known as TUMF Zones. Each TUMF Zone is allocated a budget of anticipated revenues, which are then distributed through a consensus-based approach. WRCOG then provides reimbursements to each agency as work occurs. WRCOG's facilitates this process and also reviews invoices to ensure that funds in a manner which is consistent with program requirements.

Miles

(https://www.sacrt.com/apps/miles-get-rewarded-for-your-commute-travel/)

The City of Sacramento, Sacramento Regional Transit, and Sacramento State partnered with Miles, a new app that will rewards users with redeemable miles for their commute and travel. The redeemable miles can be exchanged for exclusive experiences, products and services with vendors including Ray-Ban, Illy, Audible, and Rockport. Miles app users automatically earn miles for daily travel and receive bonus miles for green trips (walk, bike, carpool or transit). Sacramento residents are also eligible to complete special challenges to earn additional rewards. While this program was not set up as an VMT mitigation exchange or bank, it could evolve into one.

The purpose of rewarding green trips and the special challenges is to influence user behavior to reduce vehicle trips and VMT. With some additional accounting of user travel behavior before and after using the app, enough substantial evidence could be created to provide the VMT reduction verification described above and noted in the flow charts. The program already has administrative functions developed and

established relationships between the partner agencies. Some of the unknowns at this time are listed below.

- cost of the program on a per user basis
- amount of VMT reduction that is achieved for a typical user
- how a developer could contribute to the program to sponsor additional users
- stability or permanency of VMT reductions dependent on 'challenges'

In addition to the Miles program, other similar vendors exist such as Luum (https://luumbenefits.com/) and Metropia (https://www.metropia.com/). These types of app-based vendors could evolve to offer exchange or bank type mitigation options if they can comply with the various requirements outlined in the implementation steps and identified in the U.C. Berkeley white paper cited above.

Metro Transit Pass Subsidy

Metro is the Los Angeles County mobility provider. One of the programs they currently offer is a transit pass subsidy with a couple of unique elements that may qualify it as a VMT mitigation exchange. Metro offers student and employee transit passes under their U-pass and E-pass programs. These are transit passes for students and employees in LA County that are unique because instead of a physical transit pass card, the pass comes in the form of an RFID chip with an antenna that sticks to an existing student or employee identification badge. This type of chip allows the transit agency to charge for trips when they are made, which is more cost-effective for schools and employers. The registration form for obtaining the pass includes a survey about current travel behavior and data such as the distance between home and school or work for the applicant. By tracking how individual travel behavior changes from this baseline condition over time, LA Metro can produce aggregate statistics about the effect on transit ridership and VMT.

The second unique component of the program is that Metro allows anyone to 'sponsor' these passes for a particular school or employer. As such, they are entertaining the concept of using the program as an SB 743 VMT mitigation exchange. Developers could purchase U- or E-passes and could use the Metro performance data to estimate the VMT reduction per pass. LA Metro is working with LA DOT and SCAG on a pilot concept this year to formalize the program. As part of this white paper development, we asked Metro if developers/agencies outside Los Angeles County could participate. The reason for this request is that VMT mitigation dollars spent on Metro transit passes may be more effective than the same dollars spent in other communities. Whether local communities would be willing to allow mitigation dollars across borders will likely depend on a variety of factors but knowing that it is feasible on the Metro end is an important first feasibility question. Metro replied that their work has not progressed sufficiently to answer this question yet.

Expanded Public Agency Telecommute Bank

With increased telecommuting during the COVID-19 shelter-in-place order, public agencies may decide to permanently expand their telecommuting offerings to employees. When making that decision, these agencies could 'bank' the commute VMT savings from each employee into a mitigation program. The agency would then have the option to allocate the VMT savings to individual development or transportation projects. The allocation process could be gifted, auctioned, or offered at a fixed price. WRCOG could function as an umbrella facilitator for this type of program with responsibility for collecting and organizing the VMT savings into a single 'bank' and then disposing of the savings to individual projects as mitigation subject to all the program expectations outlined above.

IMPLEMENTATION RISKS

As explained above, VMT exchanges or banks come with unique requirements such as the 'additionality' test and ongoing verification that make them more challenging to implement than a conventional transportation impact fee program. However, exchanges and banks offer the ability to include program-type strategies directed at changing travel behavior that are not available in a conventional impact fee program. Given these tradeoffs, we assessed whether other risks could influence the choice of program.

One risk that stood out was related to current legal challenges to the use of carbon offsets that are based on similar concepts. In a recent legal case, the Sierra Club, Center for Biological Diversity, and Cleveland National Forest Foundation, Climate Action Campaign, Endangered Habitats League, Environmental Center of San Diego, and Preserve Wild Santee challenged the County of San Diego over the use of carbon offsets to achieve GHG reduction goals in the County's climate action plan. The court petition is available at the link below.

- https://www.biologicaldiversity.org/programs/urban/pdfs/San-Diego-CAP-Petition-for-Writ-of-Mandate.pdf

The California Attorney General's (AG's) office has also weighed in on this court case. According to a November 11, 2019 Los Angeles Times article, "California says San Diego County could undermine state's greenhouse gas plan", the AG's office filed an amicus brief. The article reported the following about the AG's brief.

> *In a strongly worded amicus brief recently submitted to the 4th District Court of Appeal in San Diego, Becerra argued that the county's offset strategy would "perpetuate current sprawling development patterns, which will impede the ability of the region and state to reach their long-term climate objectives."*
>
> *"Without significant [vehicle miles traveled] reductions across the state, California simply will not be able to achieve its [greenhouse gas] reduction targets," the 33-page document said.*

The state does not appear to support reducing GHG emissions from land use development without those reductions coming from fundamental local land use and transportation network changes. The risk is that lower density suburban and rural parts of the state would continue their sprawling patterns leading to more VMT and emissions. If the state maintains this position, it could also be used to argue against the creation of VMT mitigation exchanges and banks that attempt to offset VMT increases. To minimize this risk, the mitigation options offered by exchanges and banks could be applied only after project site mitigation has been exhausted and should attempt to offer additional mitigation within the same area or community.

GOVERNANCE

Governance for a VMT mitigation program is another important part of assessing program feasibility for a particular agency. The definition of governance for the purposes of this assessment includes the following three components.

1. Who makes program decisions?
2. How are decisions made?
3. Who is accountable for decisions?

These questions are answered below based on WRCOG serving as the specific agency that would implement and operate the VMT mitigation program. Since the answers will vary depending on the exact type of mitigation program, WRCOG was asked about specific program types of most interest. In response, three program options were identified.

- Modified TUMF – This option involves a modification to the existing TUMF where a new VMT reduction nexus is added. This change would allow the creation of two separate capital improvement programs (CIP) with their own separate fee schedules. A roadway capacity CIP would be retained for the LOS nexus component of the program and a new VMT mitigation CIP would be created. Some of the existing projects in the TUMF CIP are VMT reducing such as transit, bicycle, and pedestrian projects. These would be moved to the new VMT mitigation CIP presuming they are consistent with the new VMT reduction nexus requirement. If changes are limited to this new accounting and nexus approach, impact fees would remain relatively stable.

  This option also allows for new VMT reducing projects to be added to the VMT mitigation CIP. The more projects that are added, the greater the potential VMT reduction, but also the greater the impact fees. Under this option, the TUMF would continue to serve a mitigation program for land use development projects. No mitigation would be available through the program for transportation infrastructure projects that generate new VMT.

- New VMT Impact Fee Program – This option involves creating a new VMT impact fee program focused solely on achieving VMT reduction through the CIP projects. The CIP would largely consist of active transportation and transit projects where sufficient evidence exists to demonstrate a VMT reduction nexus. The program would also be targeted exclusively for land use development project mitigation.

- New VMT Mitigation Exchange – This option is the most flexible in terms of offering VMT mitigation for both land use and transportation infrastructure projects. The program would identify VMT reduction projects that could be either fully funded or directly implemented by land use project applicants or transportation project sponsors. The type of project could include capital projects similar to those mentioned above for the impact fee programs plus TDM strategies or activities that reduce VMT. TDM often involves information development and dissemination and actions that change travel behavior. Since these do not qualify as capital projects, they are typically excluded from impact fee programs. As long as these strategies or activities have a clear nexus to VMT reduction, they would qualify for the VMT mitigation exchange project list. By covering VMT mitigation for transportation projects (i.e. roadway capacity projects causing induced vehicle travel impacts), more agencies could participate in the program and more VMT reduction could be delivered.

These options do not include a mitigation bank. As explained above, banks are more complex and require more effort to create, operate, and maintain without current evidence showing that the higher investment would necessarily produce greater VMT reduction than an impact fee program or exchange.

Who makes program decisions?

The simple answer to this question is that WRCOG makes the decisions, but that is not precise enough to fully understand what individuals or groups of individuals are authorized to make different types of decisions. WRCOG was formed through a joint powers agreement (JPA) is composed of all 18 incorporated Cities, Riverside County, Eastern and Western Municipal Water Districts, the Morongo Band of Mission Indians, and the Riverside County Superintendent of Education. The main decision-making body of WRCOG is the Executive Committee which is comprised of elected officials from each of WRCOG's member agencies and meets monthly to discuss policy issues and consider recommendations from WRCOG's Technical Advisory Committee (TAC), primarily comprised of the region's City Managers.

How are decisions made?

Any decision related to the implementation of any option identified above would ultimately be made by the Executive Committee after discussions, input, and voting has occurred at the various policy committees. On-going operation of the program would occur at the Executive Director, Transportation & Planning Director, and Public Works Committee (PWC) levels. Decisions and informational items are first brought to the Public Works and or Planning Directors Committee (PDC). Recommendations are then brought forth to the TAC. Following this would be the Administration & Finance Committee (AFC) who

provide budget and finance overview, which is comprised of a smaller group of elected officials who are also members of the Executive Committee. The final decision recommendations are lastly brought to the Executive Committee who make the final determination.

Once a program is established, WRCOG staff would oversee the program with input from WRCOG's member agencies, primarily through WRCOG's existing committee structure.

Who is accountable for decisions?

The WRCOG organization described above is transparent with an emphasis on a streamlined approach to decision-making. For day-to-day decision making, responsibility and accountability lies with the Executive Director and the Transportation & Planning Director. Major decisions are reserved for the Executive Committee since it has sole authority to adopt and amend by-laws for the administration and management of the JPA.

The table below summarizes the governance expectations above.

Type of Program	Who Makes Program Decisions?	How Are Decisions Made?	Who is Accountable?
Modified TUMF Program	Creation of the program - WRCOG Executive Committee Operation of the program - WRCOG Executive Committee, Executive Director, Transportation & Planning Director, AFC, TAC, and PWC	Decisions can originate from questions at any level of the agency, member agency, or the public. These are then resolved at the PWC, PDC, TAC, AFC or Transportation & Planning Director level for day-to-day operations and the Executive Committee for more significant decisions.	Executive Director and Transportation & Planning Director for day-to-day operations and the Executive Committee for more significant decisions.
New VMT Impact Fee Program			
New VMT Mitigation Exchange			

Advancing Implementation

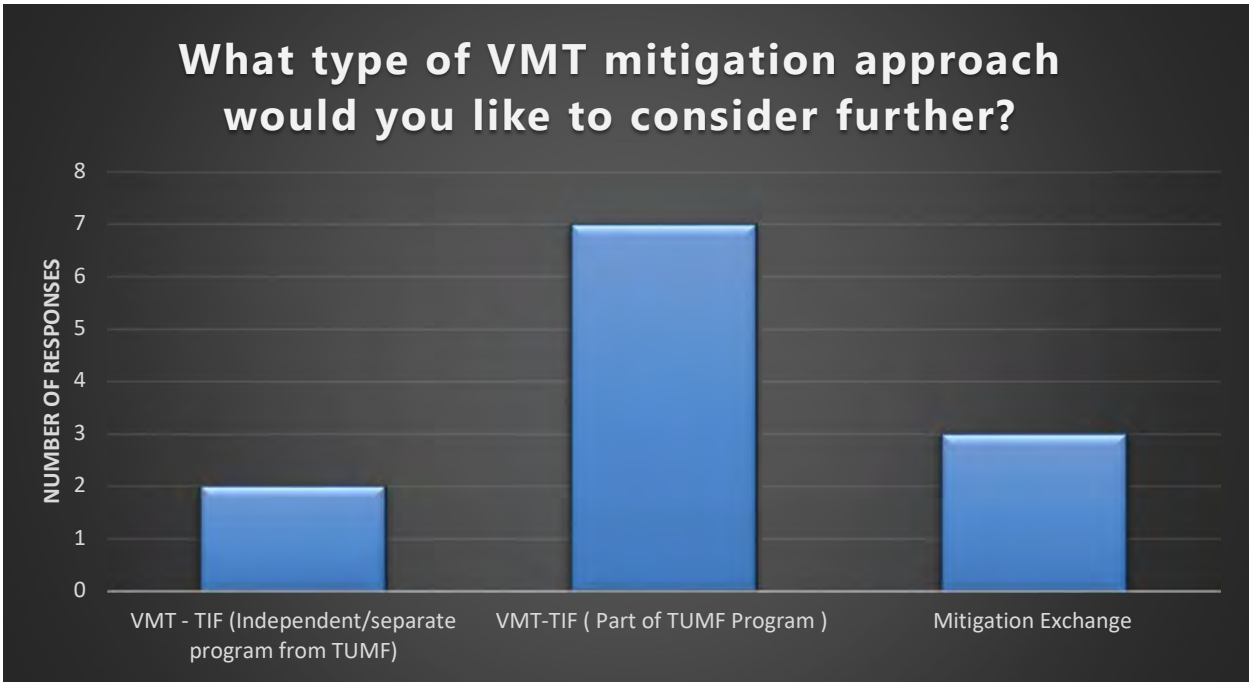
Advancing one of the three options above would begin with a formal proposal by WRCOG staff at the PWC where informative discussions, presentations, and options would be explored. With the recommendation of the PWC it would then advance to the other policy committees in the following order.

- TAC
- AFC
- Executive Committee

Prior to implementing any new Program, WRCOG would need to develop a concrete proposal for recommendation. Given WRCOG's experience, this proposal should address each item below.

- The exact structure to be implemented (bank, exchange, or fee).
- The relationship between this program and other WRCOG programs.
- Program governance, which would likely be modeled after existing WRCOG programs like TUMF.
- Supporting documentation related to this proposal such as any quantification methods related to VMT reductions and other applicable items.

WRCOG Staff conducted a survey of its member agencies late in 2019 and early in 2020 to gauge their interest in either a VMT mitigation fee or exchange. The survey results are provided below. Based on the survey responses, it appears that a majority of our local agencies prefer a fee-based approach, though there is support for an exchange as well.



Based on that positive feedback, there appears to be merit in advancing a mitigation program. The next steps would generally focus on increased socialization of this concept and conceptual program development. Specific tasks WRCOG should undertake would include but not be limited to the following items.

- Convening a meeting with the Riverside County Transportation Commission (RCTC) and Riverside Transit Agency (RTA) to discuss this concept in greater detail.
- Identify at least two options for either a fee-based approach and an exchange, which would include an evaluation of their use for mitigating development and infrastructure projects.
- A review of the latest guidance from OPR and Caltrans regarding VMT impacts and the applicability of this type of program or programs to address any issues they have raised as SB 743 is implemented.
- Coordination with the upcoming TUMF Nexus Study update to ensure that the Nexus Study scope of work provides the necessary information for this type of program.

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FEHR & PEERS

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