CEQA GUIDELINES FOR VEHICLE MILES TRAVELED THRESHOLDS

for the

CITY OF FRESNO

June 18, 2020
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CEQA GUIDELINES FOR
VEHICLE MILES TRAVELED THRESHOLDS

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EXECUTIVE SUMMARY

Senate Bill (SB) 743, signed in 2013, changes the way transportation studies are conducted in California Environmental Quality Act (CEQA) documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. As a result of the final rulemaking surrounding SB 743 and the implementation deadline of July 1, 2020, the City of Fresno is adopting the new VMT thresholds and guidelines to address the shift from delay-based LOS CEQA traffic analyses to VMT CEQA traffic analyses.

This document discusses in further detail the following:

- Definition of region for VMT analysis
- Standardized screening methods for VMT threshold compliance data
- Recommendations for appropriate VMT significance thresholds for development projects, transportation projects, and plans
- Feasible mitigation strategies applicable for development projects, transportation projects, and plans
- For purposes of this analysis, the Fresno Council of Governments (COG) Activity-Based Model (ABM)\(^1\) was used to develop screening maps. The Fresno COG ABM base year was updated from 2014 to 2019 based on consultation with Fresno COG staff. The appropriate use of the ABM for VMT calculations has been further elaborated in subsequent chapters of this document.

This document will serve as a detailed guideline for preparing VMT analysis consistent with SB 743 requirements for development projects, transportation projects, and plans. Project applicants will be required to follow the guidance provided in this document for preparation of CEQA VMT analysis.

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<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ABM</td>
<td>Activity-Based Model</td>
</tr>
<tr>
<td>ADT</td>
<td>average daily trips</td>
</tr>
<tr>
<td>CalEEMod</td>
<td>California Emissions Estimator Model</td>
</tr>
<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
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<tr>
<td>CAPCOA</td>
<td>California Air Pollution Control Officers Association</td>
</tr>
<tr>
<td>CARB</td>
<td>California Air Resources Board</td>
</tr>
<tr>
<td>CEQA</td>
<td>California Environmental Quality Act</td>
</tr>
<tr>
<td>City</td>
<td>City of Fresno</td>
</tr>
<tr>
<td>CO₂e</td>
<td>carbon dioxide equivalent</td>
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<tr>
<td>COG</td>
<td>Council of Governments</td>
</tr>
<tr>
<td>EIR</td>
<td>Environmental Impact Report</td>
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<tr>
<td>EO</td>
<td>Executive Order</td>
</tr>
<tr>
<td>FAR</td>
<td>floor-to-area ratio</td>
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<tr>
<td>GHG</td>
<td>greenhouse gas</td>
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<tr>
<td>GPA</td>
<td>General Plan Amendment</td>
</tr>
<tr>
<td>GWP</td>
<td>global warming potential</td>
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<tr>
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<td>high-occupancy toll</td>
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<tr>
<td>HOV</td>
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<tr>
<td>ITE</td>
<td>Institute of Transportation Engineers</td>
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<tr>
<td>LOS</td>
<td>level of service</td>
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<tr>
<td>mi</td>
<td>mile</td>
</tr>
<tr>
<td>MT</td>
<td>metric ton</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<td>-----------</td>
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<tr>
<td>MPO</td>
<td>Metropolitan Planning Organizations</td>
</tr>
<tr>
<td>OPR</td>
<td>Governor’s Office of Planning and Research</td>
</tr>
<tr>
<td>PRC</td>
<td>Public Resources Code</td>
</tr>
<tr>
<td>RTP</td>
<td>Regional Transportation Plan</td>
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<tr>
<td>RTPA</td>
<td>Regional Transportation Planning Agency</td>
</tr>
<tr>
<td>SB</td>
<td>Senate Bill</td>
</tr>
<tr>
<td>SCS</td>
<td>Sustainable Communities Strategy</td>
</tr>
<tr>
<td>sf</td>
<td>Square foot/feet</td>
</tr>
<tr>
<td>SOC</td>
<td>Statement of Overriding Considerations</td>
</tr>
<tr>
<td>TA</td>
<td>Technical Advisory</td>
</tr>
<tr>
<td>TDM</td>
<td>transportation demand management</td>
</tr>
<tr>
<td>VMT</td>
<td>vehicle miles traveled</td>
</tr>
<tr>
<td>ZC</td>
<td>Zone Change</td>
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1.0 INTRODUCTION

Senate Bill (SB) 743, signed in 2013, changes the way transportation studies are conducted in California Environmental Quality Act (CEQA) documents. Vehicle miles traveled (VMT) replaces motorist delay and level of service (LOS) as the metric for impact determination. For development projects, VMT is simply the product of the daily trips generated by a new development and the distance those trips travel to their destinations. For capital projects, impacts are identified as the new VMT attributable to the added capital project, both from the installation of the facility and the induced growth—a new term in the CEQA lexicon—generated as a result of induced land use.

In January 2019, the Natural Resources Agency and the Governor’s Office of Planning and Research (OPR) codified SB 743 into the Public Resources Code (PRC) and the State CEQA Guidelines. State CEQA Guidelines Section 15064.3 subdivision (b) states:

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.

The OPR provides a Technical Advisory (TA) as a guidance document to establish thresholds for this new VMT metric. The laws and rules governing the CEQA process are contained in the CEQA statute
(PRC Section 21000 and following), the State CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures. The TA is intended as a reference document; it does not have the weight of law. Yet, deviating from the TA is best undertaken with substantial evidence to support the agency action.

The State of California is committed to reducing greenhouse gas (GHG) emissions and achieving long-term climate change goals. To achieve these climate change goals, California needs to reduce VMT. As illustrated in Figure 1, over the last 40 years, with increase in statewide population, the overall VMT has also increased. As illustrated in Figure 2, transportation is the single largest sector contributing to the State’s GHG emissions. More than 40 percent of the GHG emissions come from the transportation sector, primarily passenger cars and light-duty trucks. Reducing the number of vehicle trips and reducing the length of trips are expected to result in reduced VMT and reduced GHG emissions. The new State CEQA Guidelines and the establishment of VMT thresholds for CEQA analyses is linked to GHG reduction strategies and overall statewide climate change goals.

Source: https://ca50million.ca.gov/transportation/

Figure 1: VMT Per Capita Compared to Population in California
This document establishes the City of Fresno’s (City) threshold of significance for CEQA transportation studies and provides substantial evidence as appropriate. It is divided into chapters, including:

- **Chapter 2 – Definition of Region**: Here the document describes what the comparative is for analysis purposes. Each project will be compared to an existing regional average. The geographical area that defines the region is defined and described.

- **Chapter 3 – Project Screening**: OPR acknowledges that certain projects are either low VMT generators, or by virtue of their location would have a less than significant impact. The City should use these screening criteria and should offer substantial evidence for other circumstances that would lead to a less than significant impact.

- **Chapter 4 – Significance Thresholds for Development Projects**: In this chapter, the threshold that would define a significant CEQA impact is identified. This threshold is linked to a specific travel mode and a set of trip purposes. The actual VMT metric (either an efficiency rate or total VMT) is described.

- **Chapter 5 – Significant Thresholds for Transportation Projects**: This chapter describes the method to evaluate significant CEQA impacts associated with transportation projects. Many non-vehicular capital projects are presumed to have a less than significant impact. Capacity enhancing projects may have significant impacts and may be subject to a detailed analysis that will include measuring induced travel.
• **Chapter 6 – Significance Thresholds for Land Use Plans:** This chapter provides guidance and substantial evidence to support the City’s treatment of land use plans and their CEQA transportation analysis.

• **Chapter 7 – Mitigation Strategies:** Potential mitigation strategies are indicated in this chapter. It is noted that this discussion is not intended as a full list of measures the City sanctions as feasible. As in previous CEQA practice, it is generally the practitioner who identifies mitigation measures to offset the specific project related impacts identified in individual environmental document. The discussion here is intended as a reference and guide for possible strategy for applicants who may wish to investigate to offset their specific project-related significant impacts.


2.0 DEFINITION OF REGION: VEHICLE MILES TRAVELED CONTEXT

The question of context is the definition of the scope of the VMT analysis. The common term for this in previous delay-based LOS analyses is **project study area**. In the delay-based LOS analyses, a project study area is generally determined based on the incremental increase in traffic from the project and its potential to create a significant LOS impact. This generally includes intersections and roadway segments where the project would add a prescribed number of peak-hour trips. Many times, lead agencies stop study area boundaries at their jurisdictional borders.

Unlike delay-based LOS analyses, VMT is a regional effect not defined by roadway, intersection, or pathway. The OPR acknowledges this in its TA (page 6), which states,

*Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries....*

Furthermore, the recommendations for thresholds for the primary land use types (residential and office) are based on a comparison to a **regional average**. Region is not defined further in the TA. Instead, the OPR offers the following suggestions:

1. **In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as county, that includes the area over which nearly all workers would be expected to live (page 16).**

2. **For residential projects in unincorporated county areas, the local agency can compare a residential project’s VMT to (1) the region’s VMT per capita, or (2) the aggregate population weighted VMT per capita of all cities in the region (page 15).**

LSA surveyed other large urbanized areas around the State to identify what region has been established for VMT thresholds. In most cases, the county boundary has been identified as the region selected for VMT analysis. Mobility can be studied using a trip-based approach or a tour-based approach. The OPR TA states that “where available, tour-based assessment is ideal because it captures travel behavior more comprehensively.” Since Fresno COG’s model is an ABM, a tour-based approach has been followed. LSA used the Fresno COG ABM to examine the tours into and out of Fresno. As such, consistent with the OPR TA, only tours having origins or destinations or both within the City were considered. External pass-through trips were not considered. As illustrated in Figure 3, out of the total tours, about 80 percent originate and are destined within the city. Another 16 percent of tours originate or are destined within other jurisdictions in Fresno County. The remaining 4 percent home-based tours originate and are destined outside Fresno County.

Because the majority of the tours are contained within Fresno County, the county may be used to define the region. For residential projects, the TA states that “Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not
cumulatively exceed the number of units specified in the [Sustainable Communities Strategy] SCS for that city, and should be consistent with the SCS.” As such, this analysis evaluated residential VMT per capita for the City using the county as the region as well as the city boundary as the region. As illustrated in Figure 3, 85 percent of the residential trips having origins/destinations within Fresno terminate within Fresno County. Hence, based on this analysis, the City has determined to use the county as the region for all residential projects. Additionally, as illustrated in Figure 3, 90 percent of the employee trips having origins/destinations within Fresno terminate within Fresno County. Therefore, for office, retail, and all other non-residential projects, consistent with the TA, the county will be used as the region. The other OPR guidance recommends consistency in approach; once a region is established, that region should be used for all subsequent traffic analyses.

In some cases, this county boundary has other names, such as the Council of Governments boundary. Nonetheless, county is a common and reoccurring context for CEQA VMT analyses throughout the State.

![Figure 3: Percentage of Total Tours Having Origins/Destinations within the City of Fresno and Terminating within the City of Fresno, within Fresno County, or outside the County](image)

Source: Fresno COG Activity Based Model

**Figure 3: Percentage of Total Tours Having Origins/Destinations within the City of Fresno and Terminating within the City of Fresno, within Fresno County, or outside the County**

It should be recognized the use of the county as the region defines the comparative, or the denominator, in the identification of project-related impact. The numerator is the project’s VMT contribution. This project-related VMT profile may go beyond the county boundary and not be truncated by a jurisdictional boundary. For example, a new, large employment generating
development proposed near the city’s northern boundary may include VMT from as far away as Madera, Tulare, or Kings Counties or other communities in the San Joaquin Valley. In that case, it would be the responsibility of the applicant and their traffic study preparer to include the project VMT regardless of geographical limit to the satisfaction of City staff. This project-related VMT profile would be compared against the County of Fresno regional average.
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3.0 PROJECT SCREENING

The TA does acknowledge that certain activities and projects may result in a reduction in VMT and GHG emissions and therefore a less-than-significant impact to transportation and circulation. A variety of projects may be screened out of a complicated VMT analysis due to the presumption described in the TA regarding the occurrence of less-than-significant impacts.

3.1 DEVELOPMENT PROJECTS

The TA acknowledges that conditions may exist that would presume that a development project has a less than significant impact. These may be size, location, proximity to transit, or trip-making potential. For example, development projects that have one or more of the following attributes may be presumed to create a less than significant impact:

- The project is within 0.5 mile (mi) of a Transit Priority Area or a High-Quality Transit Area unless the project is inconsistent with the Regional Transportation Plan (RTP)/SCS, has a floor area ratio (FAR) less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units. In accordance with SB 743, “Transit priority areas” are defined as “an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program. A Major Transit Stop means: “a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods.” A High-Quality Transit Area or Corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

  Figure 4 depicts transit priority areas within Fresno including high-quality transit areas (within 0.5 mile of a major transit stop) served by the Fresno Area Express (FAX) with service intervals of 15 minutes or less. Projects proposed in these areas may be presumed to have a less-than-significant transportation impact unless the project is inconsistent with the RTP/SCS, has an FAR less than 0.75, provides an excessive amount of parking, or reduces the number of affordable residential units.

- The project involves local-serving retail space of less than 50,000 square feet (sf).

- The project has a high level of affordable housing units. The affordable-housing requirement to meet the screening criteria is to be determined by City staff.

- The project generates a low volume of daily traffic.

The TA recommends a volume of 110 average daily trips (ADT). This recommendation is not based on any analysis of GHG reduction but, rather, on a CEQA categorical exemption. This exemption criterion states that for existing facilities, including additions to existing structures of up to 10,000 sf, the project is exempted from CEQA as long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not located in an environmentally sensible area (State CEQA Guidelines Section 15301,
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LEGEND

- Cities with Sphere of Influence
- Route 1/Q (Bus Rapid Transit)
- Half-Mile Buffer
- Route 9 (Headway more than 15 Mins.)
- Route 9 (Headway more than 35 Mins.)
- Route 38 (Headway more than 35 Mins.)

SOURCE: Fresno Area Express (FAX) (03/20), City of Fresno (04/20), ESRI

FIGURE 4
CEQA Guidelines for Vehicle Miles Traveled Thresholds
High-Quality Transit Area Within Fresno County

SOURCE: Fresno Area Express (FAX) (03/20), City of Fresno (04/20), ESRI
R:\FSCS\2021\Fresno\EPSG\EPSG\SE\GIS\Maps\Fig_X_HQ Transit.mxd (4/28/2020)
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subdivision (e)(2). As stated in the OPR TA, for projects that have a linear increase in trip generation with respect to the building footprint, the daily trip generation is anticipated to be between 110 and 124 trips per 10,000 sf. Therefore, based on this assumption, the OPR recommends 110 ADT as the screening threshold. However, the California Emissions Estimator Model (CalEEMod) was used to characterize the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the CARB to be used statewide for developing project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table A shows the resulting annual VMT and GHG emissions from the incremental ADT.

### Table A: Representative VMT and GHG Emissions from CalEEMod

<table>
<thead>
<tr>
<th>Average Daily Trips (ADT)</th>
<th>Annual Vehicle Miles Traveled (VMT)</th>
<th>GHG Emissions (Metric Tons CO2e per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>683,430</td>
<td>258</td>
</tr>
<tr>
<td>300</td>
<td>1,021,812</td>
<td>386</td>
</tr>
<tr>
<td>400</td>
<td>1,386,416</td>
<td>514</td>
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<tr>
<td>500</td>
<td>1,703,020</td>
<td>643</td>
</tr>
<tr>
<td>600</td>
<td>2,043,623</td>
<td>771</td>
</tr>
</tbody>
</table>

Source: CalEEMod version 2016.3.2.  
CalEEMod = California Emissions Estimator Model  
GHG = Greenhouse Gas  
CO2e = carbon dioxide equivalent

A common GHG emissions threshold is 3,000 metric tons (MT) of carbon dioxide equivalent\(^2\) (CO2e) per year.\(^3\) The vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO2e/year (i.e., 50 percent or 643 MT CO2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG emissions would be less than 3,000 MT CO2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant. Therefore, the City will allow screening out projects if the project would generate less than 500 ADT.

- The development of institutional/government and public service uses that support community health, safety and welfare may also be screened from subsequent CEQA VMT analysis. These facilities (e.g. police stations, fire stations, community centers, refuse stations) are already part of the community and, as a public service, the VMT is accounted for in the existing regional average. Many of these facilities generate fewer than 500 ADT and/or use vehicles other than passenger-cars or light duty trucks. These other vehicle fleets are subject to regulation outside

\(^2\) Carbon dioxide equivalent (CO2e) is a concept developed to provide one metric that includes the effects of numerous GHGs. The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO2e.

of CEQA, such as the California Air Resources Board (CARB) and the San Joaquin Valley Air
Pollution Control District.

- The TA states “Residential and office projects that are located in areas with low VMT, and that
  incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit
  similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel
  demand model, can illustrate areas that are currently below threshold VMT. Because new
  development in such locations would likely result in a similar level of VMT, such maps may be
  used to screen out residential and office projects from needing to prepare a detailed VMT
  analysis.” LSA calculated VMT per capita and VMT per employee for the City of Fresno as well as
  the entire Fresno County. Figure 5 illustrates the comparison of these VMTs. LSA also created
  screening maps that residential and office projects within the city can use to screen projects. As
  described earlier, the City will use Fresno County as the region. Therefore, the screening maps
  have been created using the county as the region. Figure 6 illustrates Fresno’s VMT per capita
  screening map. Figure 7 illustrates the City’s VMT per employee screening map. As illustrated in
  Figures 6 and 7, most of the low VMT zones are in the central part of Fresno, where the City’s
  vision is to promote infill development. Therefore, the VMT thresholds and IDs of these zones
  will effectively screen out or exempt from further VMT analysis the desired development types
  the City wishes to see as part of the General Plan process.

![Figure 5: Average VMT per Capita (Population) and VMT per Employee for City of Fresno and Fresno County](source: Fresno COG Activity Based Model)
Fresno County Average VMT per Capita: 16.1
Threshold: 13%
Map created using Fresno County as the region.

FIGURE 6
CEQA Guidelines for Vehicle Miles Traveled Thresholds
City of Fresno - Existing VMT per Capita

LEGEND

City with Sphere of Influence
VMT per Capita
No Population
Less than 14.0
14.0 - 18.2
Greater than 18.2

SOURCE: Fresno COG Activity Based Travel Demand Model (2019)
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Fresno County Average VMT per Employee: 25.6
Threshold: 13%
Map created using Fresno County as the region.

SOURCE: Fresno COG Activity Based Travel Demand Model (2019)
R:\FCG1901 FresnoCOG VMT\GIS\VMT_Maps_04-20-2020\fig6_Fresno_EMP.mxd (4/28/2020)

FIGURE 7
CEQA Guidelines for Vehicle Miles Traveled Thresholds
City of Fresno - Existing VMT per Employee

LSA
City with Sphere of Influence
VMT per Employee
No Employee
Less than 22.3
22.3 - 28.9
Greater than 28.9

SOURCE: Fresno COG Activity Based Travel Demand Model (2019)
R:\FCG1901 FresnoCOG VMT\GIS\VMT_Maps_04-20-2020\fig6_Fresno_EMP.mxd (4/28/2020)
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• Based on the City’s traffic study guidelines or existing CEQA guidelines, other conditions may apply to screen out projects. Consistency with other plans to reduce GHG emissions may also reflect substantial evidence supporting a screening out. Or, the City may adopt the TA recommendations in total.

The Fresno COG VMT Screening Tool4 can be used to determine whether a development project may be screened from a detailed VMT analysis. It should be noted that if a project constitutes a General Plan Amendment (GPA) or a Zone Change (ZC), none of the above screening criteria may apply. The City will be required to evaluate such projects on a case-by-case basis to determine whether a VMT analysis would be required.

3.2 TRANSPORTATION PROJECTS

The primary attribute to consider with transportation projects is the potential to increase vehicle travel, sometimes referred to as “induced travel.” Based on the OPR TA, while the City has discretion to continue to use a delay-based LOS analysis for CEQA disclosure of transportation projects, changes in vehicle travel must also be quantified. The City of Fresno will solely use VMT analysis for CEQA disclosure of transportation projects, but will also require a LOS analysis for design, traffic operations, and safety purposes. The TA lists a series of projects that would not likely lead to a substantial or measurable increase in vehicle travel and which would, therefore, not require an induced travel analysis. These include the following:

• Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity

• Roadside safety devices or hardware installation such median barriers and guardrails

• Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes

• Addition of an auxiliary lane of less than 1 mi in length designed to improve roadway safety

• Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, two-way left-turn lanes, or emergency breakdown lanes that are not utilized as through lanes

• Addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit

• Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel

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• Addition of a new lane that is permanently restricted to use only by transit vehicles
• Reduction in the number of through lanes
• Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., high-occupancy vehicles [HOVs], high-occupancy toll [HOT] lane traffic, or trucks) from general vehicles
• Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority features
• Installation of traffic metering systems, detection systems, cameras, changeable message signs, and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
• Timing of signals to optimize vehicle, bicycle, or pedestrian flow
• Installation of roundabouts or traffic circles
• Installation or reconfiguration of traffic calming devices
• Adoption of or increase in tolls
• Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
• Initiation of a new transit service
• Conversion of streets from one-way to two-way operation with no net increase in the number of traffic lanes
• Removal or relocation of off-street or on-street parking spaces
• Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
• Addition of traffic wayfinding signage
• Rehabilitation and maintenance projects that do not add motor vehicle capacity
• Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
• Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
• Installation of publicly available alternative fuel/charging infrastructure
• Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor
Additionally, transit and active transportation projects generally reduce VMT and, therefore, may be presumed to cause a less than significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid-transit projects, and bicycle and pedestrian infrastructure projects. The City may use this CEQA presumption of less than significant impact to aid in the prioritization of capital projects, as the CEQA process for any of these project types would be more streamlined than other capacity-enhancing capital projects.
4.0 SIGNIFICANCE THRESHOLDS FOR DEVELOPMENT PROJECTS

The TA states that SB 743 and all CEQA VMT transportation analyses refer to automobiles. Here, the term automobile refers to on-road passenger vehicles, specifically cars and light duty trucks (page 4). Heavy-duty trucks can be addressed in other CEQA sections (air quality, greenhouse gas, noise, and health risk assessment analysis) and are subject to regulation in a separate collection of rules under CARB jurisdiction. This approach was amplified by Chris Ganson, Senior Advisor for Transportation at OPR, in a recent presentation at the Fresno COG (October 23, 2019) and by Ellen Greenberg, the California Department of Transportation (Caltrans) Deputy Director for Sustainability, at the San Joaquin Valley Regional Planning Agencies’ Directors’ Committee meeting (January 9, 2020).

The OPR has identified the subject of the thresholds as the primary trips in the home-based typology: specifically, home-based work tours. This includes residential uses, office uses, and retail uses. The home-based work tour type is the primary tourmaking during the peak hours of commuter traffic in the morning and evening periods.

The impact of transportation has shifted from congestion to climate change, and the purpose of the CEQA analysis is to disclose and ultimately reduce GHG emissions by reducing the number and length of automobile trips. As part of the SB 375 land use/transportation integration process and the GHG goal setting, the State and Regional Transportation Planning Agencies (RTPA) have agreed to reduce GHG through integrated land use and transportation planning by a statewide average of approximately 15 percent by 2035. Figure 8 illustrates the SB 375 regional GHG emission reduction targets for all the 18 Metropolitan Planning Organizations (MPOs) in California that was established by the CARB in 2018. Furthermore, in its 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, the CARB recommends total VMT per capita rates approximately 15 percent below existing conditions.

The TA therefore recommends:

A proposed (residential) project exceeding a level of 15 percent below existing regional average VMT per capita may indicate a significant transportation impact.

A similar threshold would apply to office projects (15 percent below existing regional average VMT per employee).

VMT generated by retail projects would indicate a significant impact for any net increase in total VMT.
It is noted that the aggregate GHG emission reduction sought after by CARB in the SB 375 protocols is 15 percent statewide. This is one reason OPR believes the 15 percent reduction in VMT is appropriate. The aggregate 15 percent GHG emission reduction applies across all land use and transportation activities and would indicate that the State and its individual MPOs are compliant with the SB 375 goals, the overall State climate change strategy, and Scoping Plan objectives.

CARB establishes GHG targets for each of the 18 MPOs in the State, reviews the SCSs and makes a determination whether the SCS would be able to achieve GHG reduction targets if implemented. Fresno COG’s 2018 RTP/SCS demonstrated a GHG reduction of 10 percent by 2035 through the integrated land use and transportation initiatives and capital projects listing, which meets targets set by the CARB. Fresno COG’s 2018 RTP/SCS was approved by all reviewing Federal and State authorities, including the CARB. In the spring of 2018, CARB adopted new GHG targets for all the 18 MPOs in the State based on the 2017 Scoping Plan and other new data. CARB established a 13 percent GHG reduction target for 2035 for the Fresno region’s third RTP/SCS. The State of California recognizes Fresno County’s contribution to the aggregate 15 percent statewide GHG emission reduction is 13 percent. Other regions may achieve greater reductions to achieve the aggregate statewide goal.\(^5\) As such, reduction in GHG directly corresponds to reduction in VMT. In order to reach the statewide GHG reduction goal of 15 percent, the City must reduce GHG by 13 percent. The method of reducing GHG by 13 percent is to reduce VMT by 13 percent as well.

\(^5\) The latest GHG targets by region can be found at: https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets.
Therefore, the City has established a threshold for land use developments, specifically residential and office, of 13 percent or more than the existing regional VMT per capita as indicative of a significant environmental impact.

No other discrete land use types are identified for threshold development. Mixed-use projects should be evaluated for each component of the project independently, or the City may use the predominant land use type for the analysis. The City will make a determination of the predominant land use type on a case-by-case basis based on the project description. Credit for internal trip capture should be made. Internal trip capture may be calculated using the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Handbook (for smaller projects), the Fresno COG ABM (for larger projects), or other applicable sources approved by the City. The TA suggests that City may, but is not required to, develop thresholds for any other use.

One approach is to review the City’s General Plan and/or the Fresno COG RTP/SCS and identify whether the implementation of the plan would result in a reduction of VMT and GHGs. If it does, the City may conclude the implementation of the plan, including all the other land use types will achieve the regional climate change goals. Therefore, consistency with the plan and no net change in VMT per employee for the other land use types is a rational threshold. However, for projects seeking a GPA, a project exceeding a level of 13 percent than the existing County average VMT per employee would indicate a significant transportation impact.

This approach would require disclosure of substantial evidence, including the General Plan findings, and other supporting traffic and air quality forecasting support. Additionally, if the City wishes to establish some other threshold less stringent than the 13 percent recommended for residential and office projects, a body of substantial evidence would be necessary.

Figure 9 demonstrates the potential development entitlement process to comply with the State CEQA Guidelines related to VMT and transportation impacts. It provides the path from application filing through determination of impacts. It is presented as the standard process; each development application is considered unique and may create alternative or modified steps through the process. Each step that diverges from this standard process should be accompanied with substantial evidence demonstrating compliance with other climate change and GHG emission reduction laws and regulations.

4.1 GENERAL TRANSPORTATION ANALYSIS PROCEDURE

This process will be refined as the new VMT analysis process is implemented. At the outset of the project development process, the applicant should seek a meeting with City staff to discuss the project description, the transportation study content, and the analysis methodology. Key elements to address include a description of the project in sufficient detail to generate trips and identify the potential catchment area (i.e., trip lengths if no modeling is undertaken), estimate project VMT, discuss project design features that may reduce the VMT from the project development, and discuss the project location and associated existing regional VMT percentages. As a result of the meeting, the applicant or their consultant shall prepare a transportation analysis scope of work for review and approval by the City.
Projects that will influence Caltrans facilities may be subject to the Caltrans Local Development-Intergovernmental Review program. As part of the program, Caltrans may review the VMT analysis methodology, findings, and mitigation measures, with an eye toward statewide consistency.

4.2 PROJECT SCREENING

Once a development application is filed and the meeting is held, project screening is conducted as the initial step. If the project meets any one of the screening criteria, the project may be presumed to create a less than significant impact. No further VMT analysis is necessary. The CEQA document should enumerate the screening criteria and how the project meets or exceeds that threshold. If project screening does not apply, a VMT analysis may be required. The extent of this analysis may be a simple algebraic demonstration or a more sophisticated traffic modeling exercise. This distinction is addressed later.

4.3 PROJECT VEHICLE MILES TRAVELED ANALYSIS

The first step is to identify the project land use type and the appropriate metric to use, i.e., VMT per capita, VMT per employee, or total VMT. The metric should be VMT per capita for residential projects, VMT per employee for office projects, and total VMT for retail projects. For mixed-use projects, after taking credit for internal trip capture, the project VMT can be estimated based on each component of the project independently, or the City may use the predominant land use type for the analysis. For all other uses, the metric used should be VMT per employee.

4.3.1 Small Project Vehicle Miles Traveled Analysis

Project VMT may be calculated using the Fresno COG VMT Calculation Tool\(^6\) for residential projects having less than or equal to 500 dwelling units or office projects having less than or equal to 375 employees. For all other projects, trip lengths can be determined using the Fresno COG ABM.

4.3.2 Large Project Vehicle Miles Traveled Analysis

For large or multi-use projects, use of the Fresno COG ABM is required. For purposes of City review, all projects, other than residential uses with less than or equal to 500 dwelling units or offices with less than or equal to 375 employees, should use the Fresno COG ABM. At this level of trip generation, the probability of trip fulfilment expands to an area greater than the immediate project location and may include a greater regional attraction. The Fresno COG ABM can more accurately define the select links used and the total VMT generated by the project.

Next, the project generated VMT per capita/VMT per employee/total VMT is compared to the appropriate significance threshold. This is either equal to or more than 13 percent of the existing regional average per capita or employment for specific uses, or no net increase in total VMT for retail or other uses that are consistent with the General Plan. For those projects that require a GPA, a threshold of 13 percent or more than existing regional average is appropriate as the project has yet to be evaluated as part of the City’s ultimate development vision.

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\(^6\) Fresno COG VMT Calculation Tool Link: [Link Forthcoming](#)
If the project VMT metric is less than the significance threshold, the project is presumed to create a less than significant impact. No further VMT analysis is required. If the project is greater than the significance threshold, mitigation measures are required.

4.4 MITIGATION MEASURES

The applicant is required, per CEQA, to identify feasible offsets to completely mitigate the impact created by the project. These can come from the mitigation strategies provided by the City (Appendices A and B), or selected based on the applicant and their CEQA team experience. The City must approve and accept the ultimate mitigation ascribed to the project and the related VMT percentage reduction.

If the mitigation measures mitigate the project impact to less than the jurisdictional threshold, the project is presumed to have an impact mitigated to a less than significant level. No further VMT analysis is required. If the project’s VMT impact cannot be mitigated, the City may 1) request the project be redesigned, relocated or realigned to reduce the VMT impact, or 2) require the preparation of an Environmental Impact Report (EIR) with a Statement of Overriding Considerations (SOC) for the transportation impacts associated with the project. All feasible mitigation measures must be assigned to and carried out by the project even if an EIR/SOC is prepared.
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Figure 9: VMT Analysis Process for Development Projects
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5.0 SIGNIFICANCE THRESHOLDS FOR TRANSPORTATION PROJECTS

The 2020 CEQA Guidelines include Section 15064.3.b.(2) to address transportation projects. It reads:

*For roadway capacity projects, agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements.*

The City may continue to use delay and LOS for transportation projects for design and traffic operation purposes as long as impacts related to “other applicable requirements” are disclosed. This has generally been interpreted as VMT impacts and other State climate change objectives. These other applicable requirements may be found in other parts of an environmental document (i.e., air quality, GHG), or may be provided in greater detail in the transportation section.

For projects on the State highway system, the Caltrans will use and will require sponsoring agencies to use VMT as the CEQA metric, and Caltrans will evaluate the VMT “attributable to the project” (Caltrans Draft VMT-Focused Transportation Impact Study Guide 2020). Caltrans may review environmental documents for capacity-enhancing projects for the City’s analysis of VMT change.

The assessment of a transportation project’s VMT should disclose the VMT without the project and the difference in VMT with the project. Any growth in VMT attributable to the transportation project would result in a significant impact.

The primary difference in these two scenarios to OPR is related to induced growth. Current traffic models have limited abilities to forecast induced growth, as their land use or socioeconomic databases are fixed to a horizon date. OPR refers to a limited set of reports that would indicate elasticities.

The most recent major study (Duranton & Turner 2011, p. 24), estimates an elasticity of 1.0, meaning that every 1 percent change in lane miles results in a 1 percent increase in VMT.

The TA presents one method to identify the induced growth, as follows.

*To estimate VMT impacts from roadway expansion projects:*

1. *Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).*

2. *Determine the percentage change in total lane miles that will result from the project.*

3. *Determine the total existing VMT over that same area.*
4. Multiply the percentage increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

\[
\text{[\% increase in lane miles]} \times \text{[existing VMT]} \times \text{[elasticity]} = \text{[VMT resulting from the project]}
\]

Figure 10 provides a representative illustration of induced VMT attributable to a project.

Source: Presentation: Caltrans Transportation Analysis under CEQA or TAC: Significance Determinations for Induced Travel Analysis (SHCC Pre-Release Session 2 Jeremy Ketchum, Division of Environmental Analysis, Caltrans; March 2, 2020)

**Figure 10: Induced Travel – VMT Attributable to Project**

Caltrans has identified a computerized tool that estimates VMT generation from transportation projects. It was developed at University of California, Davis and is based on elasticities and the relationship of lane mile additions and growth in VMT. It uses Federal Highways Administration definitions of facility type and ascribes VMT increases to each facility. Output includes increases on million miles of VMT per year. Caltrans is investigating its use for all its VMT analyses of capital projects on the State Highway System. Figure 11 provides an illustration of that tool.
Figure 11: Caltrans Induced Travel Calculator
The TA provides other options to identify induced growth- and project-related VMT. These include:

1. Employ an expert panel. An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.

2. Adjust model results to align with the empirical research. If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.

3. Employ a land use model, running it iteratively with a travel demand model. A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

The TA provides a final warning:

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

Fresno COG ran a few test scenarios of roadway widening projects using the Fresno COG ABM. These results were compared with the results from the Caltrans Induced Travel Calculator. The comparison demonstrated substantial difference in results. As such, it was identified that the ABM was more sensitive to project location, roadway type, surrounding land uses, and localized trip characteristics. Therefore, for most transportation projects that are not under Caltrans jurisdiction, it is recommended that the Fresno COG ABM be utilized to calculate project related induced VMT. As illustrated in Figure 10, VMT attributable to the project must be calculated by evaluating no project and with project conditions under the horizon year scenario using Fresno COG ABM. Net increase in induced VMT will result in a significant impact for the proposed project.

The concept of induced demand and the methodology to be followed is explained in greater detail in the Technical Appendices. Figure 12 illustrates a conceptual overview of the methodology to be followed to calculate induced demand. As illustrated in Figure 12, the effect of induced VMT will be required to be evaluated from both a land use and a travel demand modeling perspective. Fresno COG staff and the Resource Systems Group, Inc. (RSG) have prepared a detailed process that needs
to be conducted for this analysis. The methodology looks at induced VMT from new land uses generated by transportation capacity improvement projects by providing iterative and incremental feedback between the Fresno COG ABM and the land-use growth allocation model such that changes in the traffic network are incorporated into land-use allocation, and vice-versa. The methodology then looks at the impact of increased roadway capacity on increased traffic volumes and congestion using DaySim, the activity-based model component of the Fresno COG ABM. The methodology concludes that roadway capacity increase may lead to increased volumes, which results in increased congestion, which could be close to or the same as the congestion before the roadway capacity increase, albeit with more vehicles and an overall increase in utility.
FIGURE 1

New Project

Future Traffic Network

Skills

Accessibility Scores

ABM

VMT

Traffic Model

Land-Use Model

Base Land Use

Growth Allocation Model

Forecasted Land Use

Growth Targets

SOURCE: Fresno Council of Governments

LSA

CEQA Guidelines for Vehicle Miles Traveled Thresholds

Conceptual Methodology for Calculating Induced Demand for Transportation Projects
6.0 SIGNIFICANCE THRESHOLDS FOR LAND USE PLANS

The OPR guidance has provided guidance on the treatment of CEQA traffic analyses for land use plans in the TA. The TA reiterates previous direction regarding individual land use assessments:

- Analyze the VMT outcomes over the full area over which the plan may substantively affect travel patterns (the definition of region).

- VMT should be counted in full rather than split between origins and destinations (the full impact of the project VMT).

The TA provides a single sentence as consideration for land use plans. It states, “A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office or retail land uses would in aggregate exceed the respective thresholds recommended above.” This recommendation refers to a threshold of 13 percent or more than the existing regional average for residential and office uses and no net gain for retail land uses.

To assess a land use plan, use of a traffic-forecasting tool is recommended. Therefore, the City should use the ABM to assess VMT for land use plans. The total VMT for the plan should be identified for all tour types and all potential VMT contributors within the plan area. Model runs should be conducted for the existing base year and the horizon year with project (plan).

The SB 375 process establishes ambitious and achievable GHG reduction targets for the 18 MPOs in the State. The achievements of the targets are provided through the integration of land use planning and transportation planning, not solely through the imposition of regulation on passenger cars and light-duty trucks. The CARB reviews the SCS and the strategies and programs that the regional agencies put in place in the SCS to achieve the GHG reduction. The CARB approved the new GHG reduction targets for all the 18 MPOs in the State in the spring of 2018. The 2018 targets are applicable to the third SCSes for the MPOs.

Other legislative mandates and State policies speak to GHG reduction targets. A sample of these include:


- SB 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.


- EO S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.
• EO B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

Therefore, the recommended methodology for conducting VMT assessments for land use plans is to compare the existing VMT per capita and/or VMT per employee for the region with the expected horizon year VMT per capita and/or VMT per employee for the land use plan. If there is a net increase in the VMT metric under horizon year conditions, then the project will have a significant impact. Figure 13 illustrates the comparison of VMT per capita and VMT per employee under the horizon year for the City of Fresno General Plan compared to the existing regional VMT per capita and existing VMT per employee, respectively.

Source: Fresno COG Activity Based Model

Figure 13: VMT per Capita and VMT per Employee Comparisons – City of Fresno General Plan versus Fresno County under Existing Conditions
7.0 MITIGATION STRATEGIES

When a lead agency identifies a significant CEQA impact according to the thresholds described above, the agency must identify feasible mitigation measures in order to avoid or substantially reduce that impact. Although previous LOS impacts could be mitigated with location-specific LOS improvements, VMT impacts will require mitigation of regional impacts through more behavioral changes. Enforcement of mitigation measures will be still be subject to the mitigation monitoring requirements of CEQA, as well as the regular police powers of the agency. These measures can also be incorporated as a part of plans, policies, regulations, or project designs.

7.1 DEFINITION OF MITIGATION

Section 15370 of the 2020 State CEQA Guidelines defines mitigations as follows:

“Mitigation” includes:

a. Avoiding the impact altogether by not taking a certain action or parts of an action.

b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.

Section 15097 of the State CEQA Guidelines states that “the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects.”

VMT mitigations may not be physical improvements; rather, they are complex in nature and will significantly depend on changes in human behavior. Therefore, it will be important that the City develop a proper monitoring program to ensure the implementation of these mitigation measures, throughout the life of a project, in compliance with CEQA. The City must also coordinate with other responsible agencies as part of this monitoring program to determine the feasibility of the mitigations and whether they would last in perpetuity.

Historically, mitigation measures for LOS based transportation impacts have addressed either trip generation reductions or traffic-flow-capacity enhancements. LOS mitigation measures include adding capacity to intersections, roadways, ramps, and freeways. However, transportation demand
management (TDM) actions, active transportation amenities, and other measures to reduce the number of trips creating an impact are also possible mitigation strategies.

LOS based mitigations are mostly physical improvements whose benefits are observable, measurable, and virtually perpetual. The addition of a left-turn lane at an intersection will behave similarly regardless of location and will continue to perform as intended until the lane is removed or modified. A lane mile of roadway will carry a similar volume of traffic if designed consistently across most jurisdictions in California, and it will continue to do so as long as the lane exists.

The definition of VMT mitigation measures is somewhat different. Most VMT mitigations may seem feasible from a theoretical perspective, but practical implementation of these strategies as formal CEQA mitigation measures in perpetuity is yet to be tested. Several of these mitigations are contextual and behavioral in nature. Their success will depend on the size and location of the project as well as expected changes in human behavior. For example, a project providing a bike share program does not necessarily guarantee a behavioral change within the project’s population; the level of improvement may be uncertain and subject to the whim of the population affected.

LOS mitigations (such as addition of turn lanes) focus more on rectifying a physical CEQA impact (strategy “c” of State CEQA Guidelines Section 15370). On the contrary, the majority of VMT mitigations (such as commute trip-reduction programs) will aim at reducing or eliminating an impact over time through preservation and monitoring over the life of the project (strategy “d” of State CEQA Guidelines Section 15370). Additionally, some VMT mitigations (such as those focused on land use/location-based policies) will aim at minimizing impacts by reducing the number of trips generated by the projects (strategy “b” of State CEQA Guidelines Section 15370).

Furthermore, it may be that identified VMT impacts cannot be mitigated at the project-specific level. Most VMT impacts are in the context of the region of analysis. The incremental change in VMT associated with a project in the particular setting in which it may be located would suggest a greater VMT deficit than individual strategies can offset. Only a regional solution (e.g., completion of a transit system, purchase of more transit buses, or gap closure of an entire bicycle master plan system) may offer the incremental change necessary to reduce the VMT impact to a level of insignificance. Also, VMT, as a proxy for GHG emissions, may not require locational specificity. A project does not necessarily need to diminish the VMT at the project site to gain benefit in VMT and GHG reduction in the State. Offsets in an area where the benefit would be greater will have a more effective reduction in VMT and GHG and contribute to the State’s ultimate climate goals. This is the basis for the cap-and-trade strategies.

These issues of regional scale, partial participation, and geographic ambiguity confound the certainty of the City’s identification of VMT mitigation measures. Section 15126.4 of the State CEQA Guidelines states, “Where several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. **Formulation of mitigation measures shall not be deferred until some future time** [emphasis added].” Certainty does not yet exist that partial participation in VMT mitigation measures is permissible. Regional VMT mitigation is considered the most effective method for large-scale VMT reduction, yet the cost and implementation barriers are greater in most cases than one project can undertake. The only
exception may be where VMT mitigation strategies are provided at a regional level in the form of mitigation banks, fees, and exchanges and the projects are subject to contribute to these fee programs consistent with applicable provision to ensure compliance and consistency with CEQA and other legal requirements.

Section 21099 (b) (4) of the PRC states, “This subdivision [requiring a new transportation metric under CEQA] does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority.” Hence, despite the fact that automobile delay will no longer be considered a significant impact under CEQA, the City can still require projects to meet the LOS standards designated in its zoning code or general plan. Therefore, in that case, the project might still be required to propose LOS improvements for congestion relief in addition to VMT strategies as CEQA mitigation measures.

7.2 MITIGATION MEASURES AND PROJECT ALTERNATIVES

7.2.1 Development Projects and Community/General Plans

Mitigations and project alternatives for VMT impacts have been suggested by the OPR and are included in the TA. VMT mitigations can be extremely diverse and can be classified under several categories such as land use/location, road pricing, transit improvements, commute trip reduction strategies, and parking pricing/policy. However, the issue with VMT mitigations is the quantitative measurement of the relief provided by the strategies. How much VMT reduction does a TDM program, a bike share program, a transit route, or 1 mile of sidewalk provide? Improvements related to VMT reduction strategies have been quantified in sources such as the California Air Pollution Control Officers Association (CAPCOA) report *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA Green Book) and CARB sources, and are generally presented in wide ranges of potential VMT reduction percentages.

Appendix A is a summary of the different VMT mitigation measures and project alternatives stated in the CAPCOA Green Book (only those strategies directly attributed to transportation) and the OPR TA for development projects. It also refers to mitigation measures listed in other sources such as the VMT Measurement Calculator for the City of Los Angeles, the transportation analysis guidelines for the City of San Jose and the San Diego Region, and the memorandum Analysis of VMT Mitigation Measures Pursuant to SB 743, prepared by Iteris, Inc., for the Los Angeles County Metropolitan Transportation Authority.
Appendix B provides a list of mitigations for development projects based on the research work performed by Deborah Salon, Marlon G. Boarnet, Susan Handy, Steven Spears, and Gil Tal with the support of CARB. For a few mitigation measures, Fresno COG staff conducted additional research as applicable to the Fresno COG region using the Fresno COG ABM and locally available empirical data. Based on that analysis, specific VMT reduction percentages were developed for these mitigation measures. A detailed description of this analysis is provided in the Fresno County SB 743 Implementation Regional Guidelines. The City recommends applying these values to provide project-related mitigations. For all other mitigation measures, the project applicant will be required to provide substantial evidence while identifying a project-specific value. In case that information is not available, consistent with the Fresno COG’s recommendations, the project should apply the low point of provided ranges for VMT reduction. Where a mitigation strategy does not have an identified VMT reduction range, the project applicant would be required to provide a reduction estimate supported by evidence.

As for land use plans, the potential mitigation measures for community/general plans would be similar to those for development projects, with certain modifications. The OPR TA does not specifically state any VMT mitigations for land use plans. However, the transportation impact study guidelines for the San Diego Region list potential mitigation measures. These measures have been summarized in Appendix C along with corresponding VMT reduction percentages obtained from CAPCOA.

It must be noted that Appendices A–C provide only summaries of the mitigations stated in the sources mentioned above. The reader should refer to the original source for further details and for subsequent updates to the mitigation measures. Also, Appendices A–C do not provide an exhaustive list of mitigation measures to offset the CEQA impacts. Other measures can also be accepted by the City based on provision of substantial evidence.

As additional mitigation measures are developed to offset VMT impacts in the future for the State CEQA Guidelines process, linkages between the strategy and the incremental effect and quantified offset must be made. This can be based on other sources’ observations and measurements or the City’s experience in these practices. The key to mitigation is to base its efficacy on real and substantial evidence.

### 7.2.2 Transportation Projects

Although OPR provides detailed guidance on how to assess induced-growth impacts associated with transportation projects, it leaves the subject of mitigation measures vague. Only four strategies are suggested as mitigation measures:
• Tolling new lanes to encourage carpools and fund transit improvements

• Converting existing general-purpose lanes to HOV or HOT lanes

• Implementing or funding off-site travel demand management

• Implementing Intelligent Transportation Systems strategies to improve passenger throughput on existing lanes

No quantified reduction percentage is allocated to these strategies, and LSA could find no substantial evidence that would provide guidance to levels of significance after implementation of these strategies. Review of the four recommended strategies suggests that OPR is directing strategies away from general-purpose mixed-flow lanes on expressways, freeways, and arterial highways. Inasmuch as these are the project descriptions and Purpose and Need, the project intent and the project mitigation may be at odds. The City would be subject to an SOC for the capital project VMT impact.

7.3 FUNDING MECHANISMS

The change in the metric for transportation impacts from LOS to VMT will lead to a shift in impacts and mitigation measures from being local and project-specific to being more regional in nature. OPR acknowledges the regional nature of VMT impacts and states that regional VMT reduction programs and fee programs (in-lieu fees and development impact fees) may be appropriate forms of mitigation. Fee programs are particularly useful to address cumulative impacts. It is very important for the City to coordinate with the RTPA or Fresno COG to develop such mitigation programs that would fund transit, develop active transportation plans, etc. These programs are regional in nature and best suited for administration by the regional agency. Regional agencies may also wish to coordinate with appropriate stakeholders, including participating local jurisdictions, developers, and other interests while conducting nexus studies and checking for rough proportionality and compliance with CEQA.

Most of the VMT mitigations included in Appendix A are applicable in urban areas. They are less effective in suburban and rural contexts, where TDM strategies may become diluted or are not applicable. Thus, site-specific strategies are more suitable in urban areas, whereas program-level strategies are more suitable for projects in suburban/rural areas. In the latter approach, cumulative contributions for development mitigations can pay for VMT reduction strategies that would not be feasible for the individual projects to implement themselves. Apart from fee programs, program-based mitigation approaches may include mitigation exchanges and mitigation banks. The mitigation exchange concept requires a developer to implement a predetermined project that would reduce VMT in order to propose a new one. On the other hand, the concept of mitigation banks seeks to establish monetary values for VMT reductions so that developers can purchase VMT reduction credits.
As previously stated, VMT impacts are more regional in nature. Hence, there might be requirements for mitigations outside the control of the City, and without consent from the agency controlling the mitigations, the impacts might remain significant and unavoidable. Additionally, identification of regional improvements where projects can contribute their fair share to mitigate impacts might prove to be difficult. Therefore, LSA recommends that the City work collaboratively within its regions to ultimately establish fee programs, mitigation banks, and exchanges as the most efficient way to establish a regional mitigation pathway where the projects can contribute. Procedural flow charts for VMT banks, exchanges, and impact fees are illustrated at the end of this chapter.
Procedural Flow Chart – VMT Bank

Procedural Flow Chart – VMT Exchange

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APPENDIX A

VEHICLE MILES TRAVELED MITIGATION MEASURES FOR DEVELOPMENT PROJECTS (CAPCOA)
<table>
<thead>
<tr>
<th>Mitigation Measure</th>
<th>VMT Reduction1</th>
<th>Local VMT Reduction Calculation (Local Need/Change/City Mile)</th>
<th>CAPCOA2</th>
<th>DVR LA3</th>
<th>Los Angeles County4</th>
<th>City of LA5</th>
<th>City of Los Angeles6</th>
<th>San Diego County7</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a bus Rapid Transit System (Addition of a New Route)</td>
<td>0.25% – 0.30%</td>
<td>0.25% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TST-1 (Applicable in urban and suburban context; negligible in rural context; appropriate for specific or general plans). This can be considered under Technical Advisory Measure. Improve pedestrian or bicycle networks, or transit service.</td>
</tr>
<tr>
<td>Provide a bus Rapid Transit System (Substitution of an Existing Bus Route with a WVT Route)</td>
<td>0.25% – 0.30%</td>
<td>0.25% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TST-1 (Applicable in urban and suburban context; negligible in rural context; appropriate for specific or general plans). This can be considered under Technical Advisory Measure. Improve pedestrian or bicycle networks, or transit service.</td>
</tr>
<tr>
<td>Subsidized vanpool</td>
<td>0.10% - 4.45%</td>
<td>0.40% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA TST-6 (Provide Employer Sponsored Vanpool/Shuttle; applicable in urban, suburban, and rural context; appropriate for office, industrial, and mixed-use projects). The measure is intended to reduce the Technical Advisory Measure. Provide incentives or subsidies that increase the use of mode other than single-occupancy vehicle. City of San Jose (Applicable for employment site only).</td>
</tr>
<tr>
<td>Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching or shuttle services</td>
<td>0.05% - 0.45%</td>
<td>0.05% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Where applicable in urban context, measure is applicable for urban, suburban, and rural context; and appropriate for office, industrial, and mixed-use projects. Similar measure in CAPCOA TST-10 (Implement a School Bus Program). Applicable for urban, suburban, and rural context and appropriate for residential and mixed-use projects. City of San Jose (School bus program - residential uses only). City of LA (School bus program – level of implementation (low, medium, high)); Employer sponsored vanpool or shuttle (Degree of implementation (low, medium, high); employee eligible (Low, employee site format; medium, large);</td>
</tr>
<tr>
<td>Expand transit network</td>
<td>0.10% – 0.20%</td>
<td>0.10% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TST-5: Measure applicable in urban and suburban context, inside applicable in rural context but literature documentation available, appropriate for specific or general plans. This can be considered under Technical Advisory Measure. Improve pedestrian or bicycle networks, or transit service. City of San Jose (Implement transit service for residents only); City of LA (Existing transit service for residents only); City of LA (Existing transit service for residents only).</td>
</tr>
<tr>
<td>Incorporate bike lane street design (on-street)</td>
<td>0.05% VMT reduction per 100 miles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA GDT-5: [Gap avoided strategy; benefits of bike lane street design are small and should be grouped with this LTI-9] Improve design of development strategy to strengthen green network characteristics and enhance multimodal environment. The measure is applicable in urban and suburban contexts and appropriate for residential, retail, office, industrial, and mixed-use projects.</td>
<td></td>
</tr>
<tr>
<td>Improve or increase access to transit</td>
<td>CAPCOA TST-3: Not quantified alone, grouped strategy with TST-7 'Expand transit network' and TST-9 'Increase transit service frequency per trip'</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TST-3: Implement Transit Access Improvements (Applicable in urban and suburban context, and appropriate for residential, retail, office, mixed-use, and industrial projects). CAPCOA GDT-5: Increase Transit Accessibility (May be grouped with CAPCOA Measure List 9: Mixed-use development). TST-9: Increase transit service frequency per trip.</td>
<td></td>
</tr>
<tr>
<td>Increase access to common goods and services, such as groceries, schools, and daycare</td>
<td>Similar to CAPCOA ULI-2: Increase (Density of Urban and Suburban Developments Mixed Use)</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA ULI-3: Increase (Density of Urban and Suburban Developments Mixed Use) (Applicable in urban and suburban context; negligible in rural context [unless the project is in a major commercial community; appropriate for mixed-use projects) and CAPCOA GDT-6: (Applicable in urban and suburban context; negligible in rural context; appropriate for residential, retail, office, industrial, and mixed-use projects). City of San Jose (Available to Neighborhood Schools). Applicable for residential uses only).</td>
<td></td>
</tr>
<tr>
<td>Incorporate affordable housing into the project</td>
<td>0.05% – 1.20%</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar measure in CAPCOA ULI-6: [Integrate Affordable and Below-Market Rate Housing] (Applicable in urban and suburban contexts; negligible impact in a rural context unless transit availability and proximity to places are existing characteristics; appropriate for residential and mixed-use projects). City of San Jose (Similar to measure [Integrate Affordable and Below-Market Rate Housing] - Measure is applicable for residential use only).</td>
</tr>
<tr>
<td># Mitigation Measure</td>
<td>VMT Reduction&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Local VMT Reduction Calculation (Local Source/Program/CAPCOA)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>CAPCOA&lt;sup&gt;c&lt;/sup&gt;</td>
<td>DFR&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Los Angeles&lt;sup&gt;e&lt;/sup&gt;</td>
<td>City of San Diego&lt;sup&gt;f&lt;/sup&gt;</td>
<td>San Diego&lt;sup&gt;g&lt;/sup&gt;</td>
<td>Notes</td>
<td></td>
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<td>--------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Increase annual per capita vehicle miles traveled</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Bicyclists to reduce vehicle miles traveled (VMT)) would result in a mode shift and therefore reduce the traditional VMT and GHG emissions. Range depends on the available VMT network and support facilities, VMT ownership levels, and the degree of shift from traditional. Measure is applicable in urban, suburban, and rural context, for small bicycle or large multi-use developments, and appropriate for mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Improve pedestrian network improvements</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Improve bicycle parking facility accessibility</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Increase transit service frequency/speed</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Improve project contributions to transportation infrastructure improvement projects</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects, measure similar to some of the measures discussed above)</td>
<td></td>
</tr>
<tr>
<td>Increase transit stop spacing</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Provide traffic calming measures</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
<td></td>
</tr>
<tr>
<td>Improve bicycle parking in non-residential projects</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects, measure similar to some of the measures discussed above)</td>
<td></td>
</tr>
<tr>
<td>Improve bicycle parking in multi-unit residential projects</td>
<td>N/A</td>
<td>Y Y Y Y Y Y</td>
<td>Y Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A. CAPCOA GT-7 (Applicable to urban, suburban, and rural context, appropriate for residential, retail, office, industrial, and mixed-use projects, measure similar to some of the measures discussed above)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> VMT Reduction: The reduction in vehicle miles traveled (VMT) per year is calculated using the following formula: VMT Reduction = (1 - (Reduction Rate)) * VMT, where Reduction Rate is the percentage reduction in VMT per year. The Reduction Rate is calculated using the following formula: Reduction Rate = (1 - (Reduction Measure / 100)), where Reduction Measure is the percentage reduction in VMT per year. The Reduction Measure is calculated using the following formula: Reduction Measure = (VMT Before - VMT After) / VMT Before, where VMT Before is the vehicle miles traveled before the mitigation measure is implemented and VMT After is the vehicle miles traveled after the mitigation measure is implemented.

<sup>b</sup> Local VMT Reduction Calculation: The calculation of the local VMT reduction is based on the specific mitigation measure, the local transportation network, and the specific project characteristics. The calculation is performed using the following formula: Local VMT Reduction = (1 - (Local Reduction Rate)) * Local VMT, where Local Reduction Rate is the percentage reduction in local VMT per year. The Local Reduction Rate is calculated using the following formula: Local Reduction Rate = (1 - (Local Reduction Measure / 100)), where Local Reduction Measure is the percentage reduction in local VMT per year. The Local Reduction Measure is calculated using the following formula: Local Reduction Measure = (Local VMT Before - Local VMT After) / Local VMT Before, where Local VMT Before is the local vehicle miles traveled before the mitigation measure is implemented and Local VMT After is the local vehicle miles traveled after the mitigation measure is implemented.

<sup>c</sup> CAPCOA: The calculation of the CAPCOA VMT reduction is based on the specific mitigation measure, the CAPCOA transportation network, and the specific project characteristics. The calculation is performed using the following formula: CAPCOA VMT Reduction = (1 - (CAPCOA Reduction Rate)) * CAPCOA VMT, where CAPCOA Reduction Rate is the percentage reduction in CAPCOA VMT per year. The CAPCOA Reduction Rate is calculated using the following formula: CAPCOA Reduction Rate = (1 - (CAPCOA Reduction Measure / 100)), where CAPCOA Reduction Measure is the percentage reduction in CAPCOA VMT per year. The CAPCOA Reduction Measure is calculated using the following formula: CAPCOA Reduction Measure = (CAPCOA VMT Before - CAPCOA VMT After) / CAPCOA VMT Before, where CAPCOA VMT Before is the CAPCOA vehicle miles traveled before the mitigation measure is implemented and CAPCOA VMT After is the CAPCOA vehicle miles traveled after the mitigation measure is implemented.

<sup>d</sup> DFR: The calculation of the DFR VMT reduction is based on the specific mitigation measure, the DFR transportation network, and the specific project characteristics. The calculation is performed using the following formula: DFR VMT Reduction = (1 - (DFR Reduction Rate)) * DFR VMT, where DFR Reduction Rate is the percentage reduction in DFR VMT per year. The DFR Reduction Rate is calculated using the following formula: DFR Reduction Rate = (1 - (DFR Reduction Measure / 100)), where DFR Reduction Measure is the percentage reduction in DFR VMT per year. The DFR Reduction Measure is calculated using the following formula: DFR Reduction Measure = (DFR VMT Before - DFR VMT After) / DFR VMT Before, where DFR VMT Before is the DFR vehicle miles traveled before the mitigation measure is implemented and DFR VMT After is the DFR vehicle miles traveled after the mitigation measure is implemented.

<sup>e</sup> Los Angeles: The calculation of the Los Angeles VMT reduction is based on the specific mitigation measure, the Los Angeles transportation network, and the specific project characteristics. The calculation is performed using the following formula: Los Angeles VMT Reduction = (1 - (Los Angeles Reduction Rate)) * Los Angeles VMT, where Los Angeles Reduction Rate is the percentage reduction in Los Angeles VMT per year. The Los Angeles Reduction Rate is calculated using the following formula: Los Angeles Reduction Rate = (1 - (Los Angeles Reduction Measure / 100)), where Los Angeles Reduction Measure is the percentage reduction in Los Angeles VMT per year. The Los Angeles Reduction Measure is calculated using the following formula: Los Angeles Reduction Measure = (Los Angeles VMT Before - Los Angeles VMT After) / Los Angeles VMT Before, where Los Angeles VMT Before is the Los Angeles vehicle miles traveled before the mitigation measure is implemented and Los Angeles VMT After is the Los Angeles vehicle miles traveled after the mitigation measure is implemented.

<sup>f</sup> City of San Diego: The calculation of the City of San Diego VMT reduction is based on the specific mitigation measure, the City of San Diego transportation network, and the specific project characteristics. The calculation is performed using the following formula: City of San Diego VMT Reduction = (1 - (City of San Diego Reduction Rate)) * City of San Diego VMT, where City of San Diego Reduction Rate is the percentage reduction in City of San Diego VMT per year. The City of San Diego Reduction Rate is calculated using the following formula: City of San Diego Reduction Rate = (1 - (City of San Diego Reduction Measure / 100)), where City of San Diego Reduction Measure is the percentage reduction in City of San Diego VMT per year. The City of San Diego Reduction Measure is calculated using the following formula: City of San Diego Reduction Measure = (City of San Diego VMT Before - City of San Diego VMT After) / City of San Diego VMT Before, where City of San Diego VMT Before is the City of San Diego vehicle miles traveled before the mitigation measure is implemented and City of San Diego VMT After is the City of San Diego vehicle miles traveled after the mitigation measure is implemented.

<sup>g</sup> San Diego: The calculation of the San Diego VMT reduction is based on the specific mitigation measure, the San Diego transportation network, and the specific project characteristics. The calculation is performed using the following formula: San Diego VMT Reduction = (1 - (San Diego Reduction Rate)) * San Diego VMT, where San Diego Reduction Rate is the percentage reduction in San Diego VMT per year. The San Diego Reduction Rate is calculated using the following formula: San Diego Reduction Rate = (1 - (San Diego Reduction Measure / 100)), where San Diego Reduction Measure is the percentage reduction in San Diego VMT per year. The San Diego Reduction Measure is calculated using the following formula: San Diego Reduction Measure = (San Diego VMT Before - San Diego VMT After) / San Diego VMT Before, where San Diego VMT Before is the San Diego vehicle miles traveled before the mitigation measure is implemented and San Diego VMT After is the San Diego vehicle miles traveled after the mitigation measure is implemented.
<table>
<thead>
<tr>
<th>Mitigation Measure</th>
<th>VMT Reduction</th>
<th>Local VMT Reduction Calculation (Local Source/Proposed CAPCOA)</th>
<th>CAPCOA</th>
<th>DPR LA</th>
<th>Los Angeles Notes</th>
<th>City of LA Notes</th>
<th>City of LA Notes</th>
<th>San Diego Notes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Avoid or eliminate parking supply</td>
<td>N/A</td>
<td>0.00% - 11.66%</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 1 (applicable in urban and suburban contexts, negligible in rural context, appropriate for residential, retail, office, industrial, and mixed-use projects); reductions can be incurred only if off-street parking is controlled (via residential permits and on-street market parking); follow multi-creted strategy including: (a) elimination/reduction of minimum parking requirements, (b) reduction of maximum parking requirements, and (c) provision of shared parking. City of LA (Increase project parking supply at the project site to ratios lower than the standard parking minimums where allowable in the San Jose Municipal Code (applicable for employment uses)); City of LA (City code parking provision (actual) parking (supply (spaced))).</td>
</tr>
<tr>
<td>20. Indirectly parking costs from property costs</td>
<td>N/A</td>
<td>0.00% - 11.66%</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 2 (applicable in urban and suburban contexts, negligible in rural context, appropriate for residential, retail, office, industrial, and mixed-use projects); complimentary strategies include workplace parking pricing. City of LA (Mitigation On-Site Parking Costs: Application for Residential Uses Only), City of LA (Monthly cost for parking (S)).</td>
</tr>
<tr>
<td>21. Provide parking cash-out programs</td>
<td>N/A</td>
<td>≥7.70% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 1: Implement employee parking cash-out. In: a) employees forgone their parking expenses (weekly, monthly, etc.) or in: b) employees forgo their employee parking expenses (weekly, monthly, etc.) and receive a parking allowance instead. In: a) employees forgone their parking expenses (weekly, monthly, etc.) or in: b) employees forgo their employee parking expenses (weekly, monthly, etc.) and receive a parking allowance instead. City of LA (Parking cash-out: Employee eligible (N)).</td>
</tr>
<tr>
<td>22. Implement or provide access to a commute reduction program - Voluntary</td>
<td>N/A</td>
<td>≥3.0% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 2: Commute Trip Reduction Program – Voluntary; is a multi-strategy program that incorporates a combination of individual measures described CAPCOA TRT 3 through TRT 8. It is presented as a means of preventing doubling-counting of reductions for individual measures that are included in this strategy. It does so by setting a maximum net reduction that should be permitted for a combined set of strategies, within a city’s overall TRT program. The main difference between a voluntary and a required program is monitoring and reporting is not required. To no established performance standards (i.e. no trip reduction requirements). The measure is applicable in urban and suburban contexts, negligible in a rural context, unless large parking use and sale of strategies implemented are relevant in rural settings. The measure is appropriate for retail, office, industrial, and mixed-use projects; City of LA (Voluntary Mitigation On-Site Parking Costs: Application for Residential Uses Only). City of LA (Employees and residents participating (N)).</td>
</tr>
<tr>
<td>23. Provide ride-sharing programs</td>
<td>N/A</td>
<td>≥0.00% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 3: Provide Ride-Sharing Programs; applicable in urban and suburban contexts; negligible impact in rural contexts, but can be effective when large employers in a rural area draw from a workforce in an urban or suburban area, such as when a major employer moves from an urban location to a rural location; appropriate for residential, retail, office, industrial, and mixed-use projects; City of LA (Monthly cost for employment uses only). City of LA (Measured in terms of employees eligible (N)).</td>
</tr>
<tr>
<td>24. Implement car-sharing programs</td>
<td>N/A</td>
<td>≥0.00% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TRT 4 (public and voluntary contexts, and appropriate for residential, retail, office, industrial, and mixed-use projects); City of LA (Car-share project setting subsidy, all others).</td>
</tr>
<tr>
<td>25. Implement bike-sharing programs</td>
<td>N/A</td>
<td>≥0.00% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Taking evidence from the literature, a 125-300% increase in bicycling (i.e. roughly 7-14% are shifting from vehicle travel) results in a negligible impact (around 1.25% VMT reduction). Notes: CAPCOA TRT 5 (This measure has minimal impacts when implemented alone. The strategy’s effectiveness is heavily dependent on the location and context. Bike-sharing programs have worked well in densely populated areas (examples in San Francisco, London, Berlin, and Tokyo) with large commuting infrastructure for biking. Bike-sharing programs should be combined with bike lane design (OT 3) or bike friendly design (OT 5-7). The measure is applicable in urban and suburban contexts only; it is negligible in a rural context, appropriate for residential, retail, office, industrial, and mixed-use projects; City of LA (Bike share for employment and residential uses). City of LA (Bike share - within 1/2 mile of existing bike share station - OR - implementing new bike share station (N)).</td>
</tr>
<tr>
<td>26. Provide transit passes</td>
<td>N/A</td>
<td>≥0.00% commute VMT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA TRT 4 (Implement Subsidized or Discounted Transit Program); City of Los Angeles (Subsidized or Discounted Transit Program); City of LA (Employees and residents eligible (N)), amount of transit subsidy to daily passenger (daily requirements (N)).</td>
</tr>
<tr>
<td>Mitigation Measure</td>
<td>VMT Reduction$</td>
<td>Local VMT Reduction Calculation (Local Source/Province COG Data)$</td>
<td>CAPCOA$</td>
<td>DPR LA$</td>
<td>Los Angeles Metro$</td>
<td>City of San Jose$</td>
<td>City of Los Angeles$</td>
<td>San Diego Region$</td>
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</tr>
<tr>
<td>27 Implement a school pool program</td>
<td>7.00% - 15.66% school VMT reduction</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>
| Notes: CAPCOA TRT 10 (This project will create a ridesharing program for school children. Most school districts provide busing services to public schools only. Pool-based school pick-ups transports students to private schools, or to schools where students cannot walk or ride but do not meet the requirements for busing. The measure is applicable in urban, suburba
| 28 Operate free direct shuttle service | N/A | N/A | Y | Y | N | N | Y | Y |
| Notes: CAPCOA TRT 4 (Provide local shuttles - Not Quantified) 3.00% - 13.46% commute VMT reduction (for CAPCOA TRT 11 - Provide Employee-sponsored (on-demand) (Shuttle)) | N/A | Y | Y | N | Y | Y | N | Y |
| 29 Provide teleworking options | N/A | N/A | Y | Y | Y | Y | Y | Y |
| Notes: CAPCOA TRT 14 (Application in urban, rural, and suburban contexts; appropriate for retail, office, industrial, and mixed-use projects). City of San Jose (Alternative work schedules and telecommute (employment uses only)). City of LA (alternative work schedules and telecommute (employees participating), tying, type of program) | N/A | Y | Y | N | Y | N | N | Y |
| 30 Subsidize public transit service-upgrades | N/A | N/A | Y | Y | N | N | Y | Y |
| Notes: CAPCOA TRT 4: (Implement subsidized or discounted transit program (the measure is applicable in urban and suburban context, negotiable in a rural context, appropriate for industrial, retail, office, industrial, and mixed-use projects). The project will provide subsidies for daily or multi-day public transit passes. The project may also provide free transfers between all subways and transit to participate. These passes can be partially or fully subsidized by the employer, school, and/or development. Many entities use revenue from parking to offset the cost of such a program. The measure is included under the Technical Advisory Measure (Provision incentive or subsidy that increase the use of modes other than single-occupancy vehicle).) City of San Jose (Implement Subsidized or Discounted Transit Program). City of LA (Transit subsidies measured by employees and residents eligible, and amount of transit subsidy per passenger (daily equivalent)) | N/A | Y | Y | Y | Y | Y | Y | Y |
| 31 Provide on-site amenities at places of work, such as priority parking for carparks and vanpools, secure bike parking, and showers and locker rooms | 12% increase in bicycle demand share (Black National Travel Survey) (6.5% reduction in commute while trips Transportation Demand Management Encyclopedia (5.62%) reduction in VMT (Center for American Policy (CEPI) Executive Guidance) | N/A | Y | Y | Y | Y | Y | Y |
| Notes: CAPCOA TRT 14 (Provide end of trip facilities). End of trip facilities have minimal impacts when implemented alone. This strategy's effectiveness is reducing vehicle miles traveled (VMT), depends heavily on the use of other transit, pedestrian/bicycle, and demand management measures offered. End of trip facilities should be grouped with Congruent Trip Reduction (CTR) Programs (TRT 5: Implement Comprehensive Trip Reduction Program - Voluntary through TRT 2: Implement Comprehensive Trip Reduction Program - Required Implementation/baselining) and TRT 3 (Private Auto Sharing Programs). City of San Jose (similar measures include: Provide bike parking near bike facilities). 'Implement car sharing programs'. City of LA (All include parking facilities, showers, & repair station (if N/A) | N/A | Y | Y | Y | N | N | Y | Y |
| 32 Provide employee transportation coordinators at employment sites | N/A | N/A | Y | Y | N | N | Y | Y |
| Notes: CAPCOA TRT 14 (Application in urban and suburban contexts; negotiable in rural contexts appropriate for residential, retail, office, industrial, and mixed-use projects) | N/A | Y | N | N | N | Y | Y | Y |
| 33 Locate project in an area of the region that already satisfies VMT 10.00% - 15.99% | N/A | N/A | Y | Y | N | N | Y | Y |
| Notes: CAPCOA 15 (Application in urban and suburban contexts; negotiable in rural contexts, appropriate for residential, retail, office, industrial, and mixed-use projects) | N/A | Y | N | N | N | Y | Y | Y |
| 34 Locate project near transit | N/A | N/A | Y | Y | N | N | Y | N |
| Notes: CAPCOA 15 (Application in urban and suburban contexts; negotiable in rural contexts, appropriate for residential, retail, office, industrial, and mixed-use projects) | N/A | Y | N | N | N | Y | Y | Y |
| 35 Increase projects development density | N/A | N/A | Y | Y | Y | Y | Y | Y |
| Notes: CAPCOA 15 (Application in urban and suburban contexts; negotiable in rural context appropriate for residential, retail, office, industrial, and mixed-use projects). City of San Jose (Applicable for both residential and employment uses) | N/A | Y | Y | Y | Y | Y | Y | Y |
| Notes: CAPCOA 15 (Application in urban and suburban contexts; negotiable in rural context appropriate for residential, retail, office, industrial, and mixed-use projects). City of San Jose (Applicable for both residential and employment uses) | N/A | Y | Y | Y | Y | Y | Y | Y |

**Notes:**
- **CAPCOA:** Community Planning & Development Agency
- **DPR LA:** City of Los Angeles Department of Planning and Resources
- **Los Angeles Metro:** Los Angeles County Metropolitan Planning Commission
- **City of San Jose:** City of San Jose
- **City of Los Angeles:** City of Los Angeles
- **San Diego Region:** San Diego County

*Table A - Vehicle Miles Traveled Mitigation Measures for Development Projects (CAPCOA)*
<table>
<thead>
<tr>
<th># Mitigation Measure</th>
<th>VMT Reduction(^a)</th>
<th>Local VMT Reduction Calculation (Local Source/Transportation Agency)</th>
<th>CAPCOA(^b)</th>
<th>DOR (^c)</th>
<th>LA</th>
<th>City of San Jose(^d)</th>
<th>City of Los Angeles(^e)</th>
<th>San Diego(^f)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve network connectivity and/or increase interaction density on the project site</td>
<td>Similar measure to CAPCOA Mitigation 1.0% Improvement in Design of Development; 1.0% – 2.0% reduction in VMT</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Notes: Measure has been included in both NTP-14 and NTP-3 (Implement transit support strategies); appropriate for residential, retail, office, and mixed-use projects; applicable for both residential and employment use.</td>
</tr>
<tr>
<td>Free work zone parking</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA TST-1 (Urban and suburban context); negligible impact in rural context; appropriate for retail, office, industrial, and mixed-use projects; reductions applied only in complementary strategies, as are applicable.</td>
</tr>
<tr>
<td>Land acquisition project near bike path/lane</td>
<td>0.12%</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA TST-4 (Grouped strategy with Increase Development Accessibility); the measure is most effective when applied in combination of multiple design elements that encourage this use; strategy should be grouped with &quot;Increase Development Accessibility&quot; strategy to increase the opportunities for multi-modal travel; measure is applicable in urban or suburban context, may be applicable in a rural master planned community; appropriate for residential, retail, office, industrial, and mixed-use projects.</td>
</tr>
<tr>
<td>Implement Commute Trip Reduction Marketing</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA TST-7 (Improve Commute Reduction Program - Voluntary); City of San Jose has &quot;free bus shuttles to work&quot; for both residential and employment use; City of LA (Employees subject to privatized parking) (NEV)</td>
</tr>
<tr>
<td>Education and encouragement - Voluntary travel behavior change program</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA TST-7 (Improve Commute Reduction Program - Voluntary); City of San Jose has &quot;free bus shuttles to work&quot; for both residential and employment use; City of LA (Employees subject to privatized parking) (NEV)</td>
</tr>
<tr>
<td>Education and encouragement - Promotions and marketing</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: Similar to CAPCOA TST-7 (Improve Commute Reduction Program - Voluntary); City of San Jose has &quot;free bus shuttles to work&quot; for both residential and employment use; City of LA (Employees subject to privatized parking) (NEV)</td>
</tr>
<tr>
<td>Implement neighborhood shuttle</td>
<td>Net Quantified</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA TST-4 (Provide local shuttles - grouped strategy with TST-5: Provide bike parking (federal and state funds) and TST-6: Increase Transit Service Frequency/Speed - applicable in urban/suburban context; appropriate for large residential, retail, office, mixed-use, and industrial projects; selects the &quot;first mile/last mile&quot; problem, City of San Jose (similar measure operates a free direct shuttle service) (applicable for employment uses only); City of LA (Degree of implementation - foot traffic); employees and residents eligible (NEV)</td>
</tr>
<tr>
<td>Add park and ride lots</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA WP-T-4 (Applicable in urban and suburban context; appropriate for residential, retail, office, mixed-use, and industrial projects); Grouped strategy with WP-T-1, WP-T-2, WP-T-3, WP-T-4, and WP-T-6 through 11</td>
</tr>
<tr>
<td>Identify loading docks and/or repairs reduction systems</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA WP-1/A-2 (Measure applicability: Truck refrigeration units (TRU))</td>
</tr>
<tr>
<td>Add alternative fueled vehicles</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Notes: CAPCOA VP-2 (Measure applicability: vehicles)</td>
</tr>
<tr>
<td>Implement CV (or other) technologies</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA WP-1/A (Applicable in urban and suburban context; appropriate for residential, retail, office, mixed-use, and industrial projects); Grouped strategy with WP-T-1, WP-T-2, WP-T-3, WP-T-4, and WP-T-6 through 11</td>
</tr>
<tr>
<td>Provide bike parking near transit</td>
<td>Net Quantified</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA TST-4 (Should be implemented with other two measures as armament to encourage multi-modal use in the area and provide ease of access to nearby transit for bicyclists (measure applicable in urban and suburban context; appropriate for residential, retail, office, mixed-use, and industrial projects); Grouped strategy with measures TST-3 (Broad transit network) and TST-4 (Increase transit service frequency/speed)</td>
</tr>
<tr>
<td>Improve design of development</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA LUT-1 (Include design elements to enhance walkability and connectivity; improved street network characteristics within a neighborhood such as street accessibility, design also measured in terms of sidewalk coverage, building setbacks, street widths, pedestrian crossings, presence of street trees, and a host of other physical variables that differentiate pedestrian-oriented environments from auto-oriented environments; measure is applicable in the urban and suburban contexts, negligible impact in rural context; appropriate for residential, retail, office, industrial, and mixed-use projects)</td>
</tr>
<tr>
<td>Provide electric vehicle parking</td>
<td>Net Quantified</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA LUT-1 (In a group of strategies within a benefits of electric vehicle parking may be quantified when grouped with the use of electric vehicles and or SDT-3 (implement a neighborhood electric vehicle (NEV) network); measure is applicable in urban and suburban context and is appropriate for residential, retail, office, mixed-use, and industrial projects.)</td>
</tr>
<tr>
<td>Mitigation Measure</td>
<td>VMT Reduction4</td>
<td>Local VMT Reduction Calculation (Local Site/Province/ODS Code)</td>
<td>CAPCOA5</td>
<td>DPR TA6</td>
<td>Los Angeles Metro7</td>
<td>City of San Diego8</td>
<td>City of Los Angeles9</td>
<td>San Diego Region10</td>
<td>Notes</td>
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<tr>
<td>Dedicate land for bike trails</td>
<td>Not Quantified</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA DOT-8 (Projects may be required to provide for, contribute to, or dedicate land for the provision of off-street bicycle trails linking the project to designated bicycle converging routes in accordance with the adopted bicycle and complete streets facilities plan. The benefits of land dedication for bike trails have not been quantified and should be grouped with the CSI (Improve Design of Development) strategy to strengthen street network characteristics and improve connectivity to off-street bicycle networks. The measure is applicable in urban, suburban, or rural contexts and is appropriate for large residential, retail, office, mixed use, and industrial projects.)</td>
</tr>
<tr>
<td>Implement school bus program</td>
<td>25.0% - CD 25% school VMT reduction</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA TRT-1 (Applicable in urban, suburban, and rural contexts, appropriate for residential and mixed-use projects)</td>
</tr>
<tr>
<td>Implement preferential parking permit program</td>
<td>Not Quantified</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Notes: CAPCOA TRT-1 (The project will provide preferential parking in convenient locations such as near public transportation or building front doors in terms of free or reduced parking fees, priority parking, or reserved parking for commuters who carpool, vanpool, ride-share or use alternatively fueled vehicles. The project will provide wide parking spaces to accommodate carpool vehicles. The impact of preferential parking permit programs has not been quantified by the literature and is likely to have negligible impacts when implemented alone. This strategy should be grouped with Commute Trip Reduction (CTR) Programs (TRT-2 and TRT-3) and TRT-3 (Private-Ride-Sharing Programs) as a complimentary strategy for encouraging non single-occupant vehicle travel. This measure is applicable in urban and suburban contexts and is appropriate for residential, retail, office, mixed-use, and industrial projects.)</td>
</tr>
</tbody>
</table>

Notes:

2. The measure was established by the California Air Pollution Control Officers’ Association in August 2011.
3. VMT reduction numbers obtained from Quantifying Emissions Mitigation Measures published by the California Air Pollution Control Officers’ Association.
4. Quantifying Emission Mitigation Measures published by the California Air Pollution Control Officers’ Association in August 2011.
5. Technical Advisory Group (TAP) for Fresno COG.
6. Notes of VMT Mitigation Measures Pursuant to SB 748 provided by Itos, Inc. in February 2018.
7. City of Los Angeles VMT Calculation Version 2.0.
8. 8th Edition of Transportation Impact Studies in San Diego Region developed by San Diego Section of the Institute of Transportation Engineers (ITE) and the San Diego Traffic Engineers Council (SDTEC) in January 2018.

**Highlighted VMT Reduction Numbers are yet to be finalized**
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APPENDIX B

VEHICLE MILES TRAVELED MITIGATION MEASURES FOR DEVELOPMENT PROJECTS (CARB PAPERS)
<table>
<thead>
<tr>
<th># Mitigation Measure</th>
<th>VMT Reduction</th>
<th>Local VMT Reduction Calculations (Local Data/Presum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COS/ABE)</td>
</tr>
<tr>
<td>1. Provide Bicycling Network Improvements</td>
<td>No effect on VMT</td>
<td>0.30% VMT reduction per 100 miles (for addition of new bike lane)</td>
</tr>
<tr>
<td>2. Implement Transit Improvements</td>
<td>No effect on VMT</td>
<td>0.07% VMT reduction per 100 miles (for addition of a new transit line)</td>
</tr>
<tr>
<td>3. Improve or increase access to transit</td>
<td>1.3% - 5.8%</td>
<td>N/A</td>
</tr>
<tr>
<td>4. Land Use Mix</td>
<td>Elasticity: 0.02 - 0.10</td>
<td>N/A</td>
</tr>
<tr>
<td>5. Regional Accessibility</td>
<td>Elasticity: 0.05 - 0.25</td>
<td>N/A</td>
</tr>
<tr>
<td>6. Job-Housing Balance</td>
<td>Elasticity: 0.06 - 0.31 for commute VMT</td>
<td>N/A</td>
</tr>
<tr>
<td>7. Provide Pedestrian Network Improvements</td>
<td>Elasticity: 0.00 - 0.02 for sidewalk length, 0.19 for Pedestrian-Environment Factor</td>
<td>N/A</td>
</tr>
<tr>
<td>8. Temporary Travel Behavior Change OUIPDC Program</td>
<td>Home-based telecommuting: 48.1% for household VMT, 60.5% - 70.0% for all personal VMT, and 93.3% for commute VMT only; Center-based telecommuting: 53.7% - 64.0% for all personal VMT and 62.0% - 77.2% for commute VMT only</td>
<td>N/A</td>
</tr>
<tr>
<td>9. Implement Employer-Based Trip Reduction (EBTR) Program</td>
<td>0.33% - 6% of commute VMT</td>
<td>N/A</td>
</tr>
<tr>
<td>10. Provide telecommuting options</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>11. Increase Project/Development Density</td>
<td>Elasticity: &lt;=0.07 - 0.19</td>
<td>N/A</td>
</tr>
<tr>
<td>12. Improve network connectivity and/or increase intersection density on the project site</td>
<td>Elasticity: 0.46 - 0.50</td>
<td>N/A</td>
</tr>
<tr>
<td>13. Implement Parking Cash-out Programs or Workplace Parking Pricing</td>
<td>11% of commute VMT (parking cash out): 2.3% - 2.5% for $3 per day workplace parking price; 2.8% for price increase equivalent to 60% hourly value of commuter travel time cost</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Notes:**

- VMT = Vehicle Miles Traveled
- All mitigation measures have been obtained from How do Local Actions Affect CMT? A Critical Review of the Empirical Evidence (Salon, D., Boarnet, M.G., Handy, S., Spears, S., and Tal, G.)
- VMT reduction values have been obtained from How do Local Actions Affect CMT? A Critical Review of the Empirical Evidence (Salon, D., Boarnet, M.G., Handy, S., Spears, S., and Tal, G.)
- Fresno COS VMT reduction recommendation for this measure obtained based on analysis conducted by Fresno COS staff and LSA using local data and/or the COS's Activity-Based Model.

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**Table B - Vehicle Miles Traveled Mitigation Measures for Development Projects (CARB Papers)**

1. Provide Bicycling Network Improvements
   - No effect on VMT
   - 0.30% VMT reduction per 100 miles (for addition of new bike lane)

2. Implement Transit Improvements
   - No effect on VMT
   - 0.07% VMT reduction per 100 miles (for addition of a new transit line)

3. Improve or increase access to transit
   - 1.3% - 5.8%
   - N/A

4. Land Use Mix
   - Elasticity: 0.02 - 0.10
   - N/A

5. Regional Accessibility
   - Elasticity: 0.05 - 0.25
   - N/A

6. Job-Housing Balance
   - Elasticity: 0.06 - 0.31 for commute VMT
   - N/A

7. Provide Pedestrian Network Improvements
   - Elasticity: 0.00 - 0.02 for sidewalk length, 0.19 for Pedestrian-Environment Factor
   - N/A

8. Temporary Travel Behavior Change OUIPDC Program
   - Home-based telecommuting: 48.1% for household VMT, 60.5% - 70.0% for all personal VMT, and 93.3% for commute VMT only; Center-based telecommuting: 53.7% - 64.0% for all personal VMT and 62.0% - 77.2% for commute VMT only
   - N/A

9. Implement Employer-Based Trip Reduction (EBTR) Program
   - 0.33% - 6% of commute VMT
   - N/A

10. Provide telecommuting options
    - N/A

11. Increase Project/Development Density
    - Elasticity: <=0.07 - 0.19
    - N/A

12. Improve network connectivity and/or increase intersection density on the project site
    - Elasticity: 0.46 - 0.50
    - N/A

13. Implement Parking Cash-out Programs or Workplace Parking Pricing
    - 11% of commute VMT (parking cash out): 2.3% - 2.5% for $3 per day workplace parking price; 2.8% for price increase equivalent to 60% hourly value of commuter travel time cost
    - N/A
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APPENDIX C

VEHICLE MILES TRAVELED MITIGATION MEASURES FOR
COMMUNITY PLANS AND GENERAL PLANS
<table>
<thead>
<tr>
<th># Mitigation Measure</th>
<th>CAPCOA VMT Reduction</th>
<th>Local VMT Reduction Calculations (Local Data/Fresno COG ABM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Shift single occupancy vehicle trips to carpooling or vanpooling by providing</td>
<td>0.30% - 13.40% commute VMT reduction (for CAPCOA TRT-11: (Provide Employer-Sponsored</td>
<td>0.60% (for vanpool); x% (for carpool)</td>
</tr>
<tr>
<td>ride-matching services or shuttle services</td>
<td>Vanpool/Shuttle)); Grouped strategy (for CAPCOA TST-6 (Provide Local Shuttles))</td>
<td></td>
</tr>
<tr>
<td>2 Provide enhanced bicycle and/or pedestrian facilities</td>
<td>0.00% - 2.00% (for pedestrian network improvements); Multiple measures for bike</td>
<td>0.30% VMT reduction per 100 miles (for addition of new bike</td>
</tr>
<tr>
<td></td>
<td>facilities, refer to Table A for VMT reduction percentages</td>
<td>lane)</td>
</tr>
<tr>
<td>3 Provide incentives or subsidies that increase the use of modes other than a single-</td>
<td>0.30% - 13.40% commute VMT reduction (for CAPCOA TRT-11: (Provide Employer-Sponsored</td>
<td>0.60% (for vanpool); x% (for carpool)</td>
</tr>
<tr>
<td>occupancy vehicle</td>
<td>Vanpool/Shuttle)); Grouped strategy (for CAPCOA TST-6 (Provide Local Shuttles));</td>
<td></td>
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<tr>
<td></td>
<td>0.30% - 20.00% commute VMT reduction (for CAPCOA TRT-4 (Implement Subsidized or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discounted Transit Program))</td>
<td></td>
</tr>
<tr>
<td>4 Modify land use plan to increase development in areas with low VMT/capita</td>
<td>Not quantified in CAPCOA</td>
<td>N/A</td>
</tr>
<tr>
<td>characteristics and/or decrease development in areas with high VMT/capita</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Add roadways to the street network if those roadways would provide shorter travel</td>
<td>Not quantified in CAPCOA</td>
<td>N/A</td>
</tr>
<tr>
<td>paths for existing and/or future trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Improve or increase access to transit</td>
<td>CAPCOA TST-2 (Implement transit access improvements); Not quantified alone, group</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>ed strategy with TST-3 (Expand transit network) and TST-4 (Increase transit service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>frequency/speed); CAPCOA LUT-5 (Increase transit accessibility): 0.50% - 24.60%</td>
<td></td>
</tr>
<tr>
<td>7 Increase access to common goods and services, such as groceries, schools, and</td>
<td>Similar to CAPCOA LUT-3 (Increase Diversity of Urban and Suburban Developments</td>
<td>N/A</td>
</tr>
<tr>
<td>daycare</td>
<td>(Mixed Use)): 9.00% - 30.00% VMT reduction and CAPCOA LUT-4 (Increase Destination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accessibility): 6.70% - 20.00% VMT reduction</td>
<td></td>
</tr>
<tr>
<td>8 Incorporate a neighborhood electric vehicle network</td>
<td>0.50% - 12.70%</td>
<td>N/A</td>
</tr>
<tr>
<td>9 Provide traffic calming</td>
<td>0.25% – 1.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>10 Limit or eliminate parking supply</td>
<td>5.00% - 12.50%</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table C - Vehicle Miles Traveled Mitigation Measures for Community Plans and General Plans 1

<table>
<thead>
<tr>
<th># Mitigation Measure</th>
<th>CAPCOA VMT Reduction</th>
<th>Local VMT Reduction Calculations (Local Data/Fresno COG ABM)2</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Implement or provide access to a commute reduction program - Voluntary</td>
<td>1.00% - 6.20% commute VMT</td>
<td>N/A</td>
</tr>
<tr>
<td>12 Provide car-sharing, bike sharing, and ride-sharing programs</td>
<td>0.40% - 0.70% VMT reduction (for car sharing); 1.00% - 15.00% commute VMT reduction (for ride-sharing); a 135% - 300% increase in biking (of which roughly 7% are shifting from vehicle travel) results in a negligible impact (around 0.03% VMT reduction)</td>
<td>N/A</td>
</tr>
<tr>
<td>13 Provide partially or fully subsidized transit passes</td>
<td>Similar to CAPCOA TRT-4 [Implement Subsidized or Discounted Transit Program]; for TRT-4, commute VMT reduction is 0.30% - 20.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>14 Provide telework options</td>
<td>0.07% - 5.50% commute VMT</td>
<td>N/A</td>
</tr>
<tr>
<td>15 Provide employee transportation coordinators at employment sites</td>
<td>Not quantified in CAPCOA</td>
<td>N/A</td>
</tr>
<tr>
<td>16 Provide a guaranteed ride home service to users of non-auto modes</td>
<td>Not quantified in CAPCOA</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Notes:**
- VMT = Vehicle Miles Traveled; Fresno COG = Fresno Council of Governments; CAPCOA = California Air Pollution Control Officers Association
- CAPCOA Transportation Mitigation Categories (LU = Land Use/Location, SD = Neighborhood/Site Enhancements, PD = Parking Policy/Pricing, TR = Commute Trip Reduction Programs, TS = Transit System Improvements, RP = Road Pricing/Management; V = Vehicles)
- All mitigation measures have been obtained from the Guidelines for Transportation Impact Studies in the San Diego Region developed by San Diego Section of the Institute of Transportation Engineers (ITE) and the San Diego Traffic Engineers Council (SANTEC) in January 2019.
- Fresno COG VMT reduction recommendation for this measure obtained based on analysis conducted by Fresno COG staff and LSA using local data and/or the COG’s Activity Based Model.

**Highlighted VMT Reduction Numbers are yet to be Finalized**
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