Summary Title: Senate Bill 743 Implementation

Title: Adoption of a Resolution Updating the City’s Transportation Analysis Methodology Under CEQA to Comply with California Senate Bill 743 and Adoption of a Local Transportation Impact Analysis Policy to Evaluate Level of Service and Other Local Roadway Impacts

From: City Manager

Lead Department: Transportation Department

Recommendation
Staff recommends that the City Council:

1. Adopt a Resolution (Attachment A) designating Vehicle Miles Traveled (VMT) as the metric for conducting transportation analyses pursuant to the California Environmental Quality Act (CEQA), establishing CEQA thresholds of significance related to VMT, and identifying screening criteria to limit review for projects presumed to have a less than significant VMT impact based on substantial evidence, and

2. Adopt a Local Transportation Impact Analysis Policy (Attachment B) establishing standards for conducting local-level transportation analyses, including Level of Service (LOS) consistent with Comprehensive Plan Program T2.3.1, and addressing identified deficiencies.

Summary
Based on revisions in State law to implement Senate Bill (SB) 743, public agencies in California are mandated to use vehicle miles traveled (VMT) as the metric for CEQA transportation analyses starting July 1, 2020. The City must establish new thresholds of significance for transportation analyses by this date. In addition, the State has mandated that level of service (LOS) may no longer be used as a threshold of significance for performing CEQA transportation analyses. However, LOS may still be used to evaluate the consistency of a proposed project with a local plan or policy.

At the Council study session on May 18, 2020, Transportation staff and the City’s consultant, Fehr and Peers, presented materials on the legislative change which included: goals and requirements of the new CEQA statute, technical advice for compliance from OPR, and the
City’s proposed approach to VMT implementation. Staff requested Council discussion on the likely staff recommendation that initial screening criteria and thresholds of significance should parallel the OPR technical advisory document, which can be found here: https://tinyurl.com/OPR-Technical-Advisory.

VMT impacts above the adopted thresholds of significance would be considered to be significant environmental impacts under CEQA. Lead agencies are required to identify feasible mitigation measures to avoid or substantially reduce those impacts. Transportation Demand Management (TDM) programs are a critical component to achieve VMT reduction targets, thus potentially aid in reducing a project’s significant environmental impacts. Staff will bring forward a TDM Ordinance with draft mitigation policies and a menu of mitigation measures in alignment with the new CEQA methodology for Council consideration.

While implementation of VMT analysis to replace LOS is required under CEQA, it did not change transportation analyses using LOS as a metric outside of CEQA. As such, the City will retain LOS standards adopted through the Local Transportation Impacts Policy in Attachment B to analyze potential local transportation impacts of projects in Palo Alto.

Adoption of the VMT thresholds of significance under CEQA and the Policy is the first in a series of critical actions related to transportation in the coming year. Staff is currently preparing the 2020 Sustainability and Climate Action Plan (S/CAP) Update and will return to Council later this year for adoption of that plan. Palo Alto’s goals for greenhouse gas reductions are more aggressive than state goals (as outlined in the adopted S/CAP Framework). Therefore, Council may choose to realign VMT thresholds of significance following completion of the S/CAP Update to better meet reductions targets.

**Background**

Pursuant to California Senate Bill (SB) adoptions in 2013 and 2018 (SB 743 and SB 375), the focus of CEQA transportation analyses shifted to reducing greenhouse gas (GHG) emissions, creation of multimodal transportation networks, and promotion of a mix of land uses that reduces the need to drive. SB 743 required the Governor’s Office of Planning and Research (OPR) to prepare amendments to the CEQA guidelines with respect to transportation analyses to use an alternative metric that better balance the needs of congestion management with statewide goals related to GHG emission reduction targets per SB 375.

The California Air Resources Board (CARB) adopted the State’s current GHG reduction targets at the March 22, 2018 Board Hearing. Subsequently in late 2018, the California Natural Resources Agency adopted OPR’s recommended updates to the CEQA Guidelines. The updated Guidelines became effective on December 28, 2018, which require agencies to use vehicle miles traveled (VMT) as the metric for CEQA transportation analyses by July 1, 2020.
The Staff report for the Council study session on May 18, 2020 provides additional background and can be found here: [https://tinyurl.com/SB-743-Study-Session](https://tinyurl.com/SB-743-Study-Session).

**Discussion**

Consistent with discussions at the Council study session on May 18, 2020, staff recommends that Council adopt the thresholds of significance for VMT that align with the State’s recommendations and the screening criteria for projects that may be presumed to have a less than significant VMT impact as set forth in the proposed Resolution in Attachment A. Consistent with Comprehensive Plan Program T-2.3.1, staff also recommends Council adoption of the Local Transportation Impacts Analysis Policy in Attachment B. The Policy establishes standards for local-level analysis outside of CEQA, including LOS and Traffic Infusion on Residential Environment (TIRE).

**Screening Criteria**

The Governor’s Office of Planning and Research (OPR) recommends agencies use screening criteria to identify projects known to reduce VMT or be low VMT generators, and that are thus expected to have a less than significant VMT impact and would exempt such projects from quantitative VMT analyses. The use of screening criteria streamlines project analysis for projects that are already presumed to have a less than significant impact on VMT, based on substantial evidence. Comprehensive Plan policies encourage housing development, to protect local-serving retail, and to reduce traffic on the roadway network. Therefore, staff recommends adopting screening criteria so these types of projects that are aligned with City policies do not have to procure costly and redundant transportation analyses that will show they are low-VMT generators under CEQA. If a project meets the screening criteria, a quantitative VMT analysis would not be required; however, the CEQA analysis would still include a qualitative discussion of VMT, discussing the site and its location characteristics. If there was substantial evidence showing that the presumption did not apply for a particular project, a quantitative analysis would be completed.

If Council approves the policy in Attachment B, these projects may still be required to analyze their consistency with LOS standards established in the policy. If the project is found to exceed LOS standards established in the policy, conditions of approval may be required for a project to address consistency with the policy.

Because of the City’s land uses and job-housing imbalance, instead of recommending OPR’s suggested screening criteria, staff is recommending the following screening criteria based on the City’s development policies. The table below presents a comparison between OPR’s suggested screening criteria and staff recommended screening criteria for Palo Alto.

<table>
<thead>
<tr>
<th>Land Use/Project Type</th>
<th>OPR’s Suggested Screening Criteria</th>
<th>Staff Recommended Screening Criteria</th>
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</table>

**Table 1: Recommended Screening Criteria**
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Developments</td>
<td>Projects that generate fewer than 110 trips per day. This may equate to non-residential projects of 10,000 sq. ft., or less and residential projects of 20 units or less.</td>
<td>Recommend OPR Criteria</td>
</tr>
<tr>
<td>Projects in Low-VMT Areas</td>
<td>Residential and office projects located in low-VMT areas that have similar features (i.e., density, mix of uses, transit accessibility) as existing developments in these areas.</td>
<td>Recommend OPR Criteria</td>
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<td>Projects in Proximity to Major Transit Stops</td>
<td>Projects that are located within a half mile of an existing or planned high-quality transit corridor or major transit stations, and meet the following additional criteria: (1) is high density (minimum floor area ratio of 0.75), (2) does not exceed parking requirements, (3) is consistent with Plan Bay Area 2040 (<a href="http://2040.planbayarea.org/">http://2040.planbayarea.org/</a>), and (4) does not replace affordable units with smaller numbers of moderate- or above moderate-income units.</td>
<td>Recommend OPR Criteria</td>
</tr>
<tr>
<td>Affordable Housing</td>
<td>100% affordable housing projects in infill locations.</td>
<td>Recommend OPR Criteria</td>
</tr>
<tr>
<td>Local-Serving Retail</td>
<td>Retail projects of 50,000 sq. ft. or less.</td>
<td>Retail projects of 10,000 sq. ft. or less.²</td>
</tr>
<tr>
<td>Transportation Projects</td>
<td>Roadway, transit, bicycle and pedestrian projects that do not lead to a measurable increase in vehicle travel.</td>
<td>Recommend OPR Criteria</td>
</tr>
</tbody>
</table>

¹ Residential projects located in areas where baseline VMT is 15% below the existing county average per resident, and office projects located in areas where baseline VMT is 15% below the existing regional average per employee could be considered to be in low-VMT areas and presumed to have a less than significant VMT impact.

² OPR indicates that local-serving retail up to 50,000 sq.ft. may be presumed to create less-than-significant VMT impact. Local-serving retails and lots in Palo Alto are typically smaller. Thus, staff is recommending 10,000 sq.ft. as the City’s local-serving retail screening criteria, which also constitutes a small project that would be screened out under CEQA.

Thresholds of Significance

Individual land use projects that are not screened out will require quantitative VMT analyses, and their VMT must be below pre-determined thresholds to be considered as having a less than significant impact. OPR’s technical advisory document recommends thresholds that vary by project and land use type. The recommended OPR thresholds are based on substantial evidence that aligns CEQA transportation analysis to meet statewide targets for greenhouse gas (GHG) emission reductions. When applying the thresholds, a project’s VMT is compared to a baseline VMT value that is typically either a citywide, countywide, or regional. In the case of the City of Palo Alto, the “county” would be Santa Clara County and the “region” would be the nine-county Bay Area. The baseline thresholds are chosen to be the most environmentally protective and are consistent with the City’s Comprehensive Plan 2030.

State requirements mandate the use of VMT as the metric for CEQA transportation analyses starting July 1, 2020. Therefore, staff recommends that Council adopt the Resolution in Attachment A, which establishes thresholds of significance for VMT that are consistent with OPR’s recommendations. These proposed thresholds are outlined in Table 2 below as well as in Attachment A. Substantial evidence to support the establishment of these thresholds is included in Attachment C.

<table>
<thead>
<tr>
<th>Table 2: Recommended VMT Thresholds of Significance by Project Type</th>
</tr>
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<tbody>
<tr>
<td>1. Residential Projects – A proposed project exceeding a level of 15% below existing (baseline) County home-based VMT per resident may indicate a significant transportation impact.</td>
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<td>2. Office Projects – A proposed project exceeding a level of 15% below existing (baseline) regional home-based work VMT per employee may indicate a significant transportation impact.</td>
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<tr>
<td>3. Retail Projects – A proposed project that results in a net increase in total (boundary) VMT may indicate a significant transportation impact.</td>
</tr>
<tr>
<td>4. Mixed-Use Projects – Each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).</td>
</tr>
<tr>
<td>5. Other Project Types – The City will either develop an ad hoc (i.e., project-specific) VMT threshold for a unique land use type or apply the most applicable of the above thresholds depending on project characteristics.</td>
</tr>
<tr>
<td>6. Redevelopment Projects – Where a proposed project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project may cause a less than significant transportation impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant transportation impact if proposed new residential, office, or retail land uses would individually exceed their respective thresholds.</td>
</tr>
</tbody>
</table>
The City’s Sustainability and Climate Action Plan (S/CAP) Framework has GHG emission reduction goals that are more aggressive than statewide goals. Therefore, Council may consider refining these thresholds in the future to reflect GHG emissions reductions goals in the S/CAP Update, once it has been adopted.

Policy Establishing Local Transportation Standards
Consistent with Comprehensive Plan Policy T-2.3 and Program T-2.3.1, staff recommends that Council adopt the Policy in Attachment B. This Policy would:

1. Establish standards for local-level analysis of transportation effects separately from CEQA;
2. Require that reviews of development projects continue to analyze LOS and traffic infusion on residential environment (TIRE); and
3. Require disclosure of a development project’s LOS and TIRE effects to enable imposition of conditions of approval addressing effects associated with exceedance of LOS standards or traffic infusion on residential environments.

Level of Service
The City of Palo Alto currently uses level of service (LOS) as the primary method for analyzing potential CEQA transportation impacts for development projects. While agencies may no longer use LOS for CEQA analysis, the City intends to retain LOS as a metric for analyzing local development projects in conformance with Policy T-2.3 and Program T-2.3.1. Furthermore, Program T-2.3.1 shows the City’s aspiration to explore standards for using multimodal level of service (MMLOS). MMLOS evaluates transportation services of roadways from various user perspectives such as transit, pedestrians, and bicyclists. Currently, MMLOS is not widely used since built environments differ greatly, and the perspectives of road users are highly subjective. Thus, there is a need for more consistency to establish a credible basis for measuring the effects of multimodal impacts. As such, staff is not recommending at this time to implement a MMLOS standard.

More background information on LOS can be found in the Staff Report to Council in September 2016 (CMR #6763; https://tinyurl.com/LOS-Study-Session-2016).


The CMP LOS standard is E, and submission of a full TIA report is required for all development projects with CMP intersections that are projected to generate 100 or more net new weekday (AM or PM peak hour) or weekend peak hour trips. A list of CMP intersections within Palo Alto is available in Attachment B.

While the CMP LOS standard is E, the City’s proposed LOS standard at signalized intersections is D, and submission of a Local Transportation Analysis (LTA) report is required for all development projects that are projected to generate 50 or more net new weekday peak hour
trips (AM or PM peak hour). Additionally, the Traffic Infusion on Residential Environment (TIRE) analysis is necessary for all development projects expecting to add 10 or more peak hour vehicles per any direction to a local residential street. The full proposed policy establishing standards for local-level analysis is available in Attachment B.

Traffic Infusion on Residential Environment (TIRE)  
Most Palo Alto streets are bordered by residential uses, and it is the City’s priority to preserve local neighborhood characteristics as described in the City’s Comprehensive Plan. The TIRE analysis is used to estimate residential perception of traffic impacts based on anticipated average daily traffic volume growth. The objective of this analysis is to determine if implementation of a project would cause a substantial change in the character of these streets, and to address potential noticeable effects through traffic management strategies.

The TIRE analysis methodology assigns a numerical value to “residents’ perception of traffic effects on activities such as walking, bicycling, and maneuvering out of a driveway on local residential streets.” The TIRE index scale ranges from 0 to 5. A TIRE index of 3 and above is perceived as functioning primarily as a traffic-dominant street and exhibiting an impaired residential environment. Therefore, streets with a TIRE index below 3 are better suited for residential activities.

Any projected change in the TIRE index of 0.1 or less is considered to have no noticeable effects. A change of 0.1 would be barely noticeable, and a change of 0.2 or greater would be noticeable. A more detailed explanation of the TIRE methodology and TIRE index can be found in the Policy in Attachment B.

Transportation Demand Management and Mitigation Measures  
For a project analyzed under CEQA that yields transportation impacts greater than the City’s adopted thresholds defined in the section above, the project is said to result in significant VMT impact and must identify mitigation measures to avoid or substantially reduce these effects.

The City has discretion in selecting VMT mitigation measures. The most common strategies for mitigating VMT impacts include:

1. Change the project land use mix or density,
2. Reduce proposed vehicle parking supply levels,
3. Implement on-site or off-site capital improvements for transit, bicycle, or pedestrian travel, and/or
4. Implement trip reduction programs usually as a Transportation Demand Management (TDM) program. TDM programs can include several components such as telecommuting, transit subsidies, shuttles, carpool matching, parking cash-out programs, and unbundled parking.²

³ Unbundling parking creates a separation of leasing or purchasing parking spaces from the lease or purchase of the residential or commercial use.
Correspondingly, a local development project not analyzed under CEQA would be required to include remediation measures to substantially reduce potential local transportation effects. Processes and thresholds for evaluating potential local transportation effects are recommended in the proposed policy in Attachment B.

As currently mandated in the City’s Municipal Code and further defined in the City’s Comprehensive Plan Program T-1.2.3, a project is subjected to a specific percentage reduction in peak hour vehicle trips using TDM programs if a project:

1. Generates 50 or more net new peak hour trips, or
2. Claims a reduction in net new trips due to proximity to public transit, or
3. Requests a parking reduction.

After adoption of changes in the City’s processes to comply with SB 743 and transportation analysis methodology for local development projects, staff will return to Council with a TDM Ordinance. The ordinance will include a menu of mitigation measures designed to effectively reduce VMT impacts for CEQA projects. Additionally, it will incorporate a monitoring structure to ensure TDM plans for local development projects are compliant with City plans and policies. Per Comprehensive Plan Program T.1.2.3, the TDM Ordinance will also require new projects citywide to reduce the number of peak hour vehicle trips by 20% to 45% depending on the location in the City.

**Policy Implications**
The City’s Comprehensive Plan 2030, adopted in December 2017, already acknowledged and incorporated the regulatory changes mandated by SB 743. While the Comprehensive Plan noted that VMT would be used as the metric for analyzing potential transportation impacts under CEQA, the Plan directed adoption of LOS standards to analyze the potential for local-level project consistency.

This item supports the following Comprehensive Plan goals, policies, and programs:

GOAL T-1: Create a sustainable transportation system, complemented by a mix of land uses, that emphasizes walking, bicycling, use of public transportation and other methods to reduce GHG emissions and the use of single-occupancy motor vehicles.

Policy T-1.3: Reduce GHG and pollutant emissions associated with transportation by reducing VMT and per-mile emissions through increasing transit options, supporting biking and walking, and the use of zero-emission vehicle technologies to meet City and State goals for GHG reductions by 2030.

GOAL T-2: Decrease delay, congestion and VMT with a priority on our worst intersections and our peak commute times, including school traffic.
Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.

Program T2.3.1: When adopting new CEQA significance thresholds for VMT for compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standards for MMLOS, which includes motor vehicle LOS, at signalized intersections.

GOAL T-3: Maintain an efficient roadway network for all users.

Policy T-3.3: Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with pedestrians and bicyclists.

Policy L-1.9: Participate in regional strategies to address the interaction of jobs, housing balance and transportation issues.

Policy L-2.3: As a key component of a diverse, inclusive community, allow and encourage a mix of housing types and sizes, integrated into neighborhoods and designed for greater affordability, particularly smaller housing types, such as studios, co-housing, cottages, clustered housing, accessory dwelling units and senior housing.

Policy L-2.4: Use a variety of strategies to stimulate housing, near retail, employment, and transit, in a way that connects to and enhances existing neighborhoods.

Program L2.4.7: Explore mechanisms for increasing multi-family housing density near multimodal transit centers.

Policy L-2.5: Support the creation of affordable housing units for middle to lower income level earners, such as City and school district employees, as feasible.

Policy L-4.2: Preserve ground-floor retail, limit the displacement of existing retail from neighborhood centers and explore opportunities to expand retail.

Policy L-4.5: Support local-serving retail, recognizing that it provides opportunities for local employment, reduced commute times, stronger community connections and neighborhood orientation.

Program L4.5.1: Revise zoning and other regulations as needed to encourage the preservation of space to accommodate small businesses, start-ups and other services.
Resource Impact
This work to develop VMT methodology, thresholds, and mitigation measures to implement SB 743 is funded through the current S/CAP consultant contract with AECOM (Fehr & Peers is a subconsultant to AECOM). Implementation of SB 743 and new CEQA Guidelines would involve the use of the VTA VMT Estimation Tool and staff training. Along with other jurisdictions in Santa Clara County, the City paid additional Congestion Management Program (CMP) dues to VTA in Fiscal Year 2020 (FY20). The dues supported development of the estimation tool. Training costs would be absorbed by the Office of Transportation and Planning and Development Services Department. The cost of performing VMT and other environmental analysis under CEQA for private development projects would be billed to applicants in accordance with the City’s standard application review cost recovery process.

Timeline
Staff will return to Council with a Transportation Demand Management (TDM) Ordinance and mitigation measures in the fall. Following the S/CAP Update adoption, staff will return to Council for direction on whether to adjust CEQA thresholds of significance to align with S/CAP policies.

Environmental Review
The adoption of a Level of Service (LOS) policy, new transportation screening criteria and reduction thresholds of significance under the California Environmental Quality Act (CEQA) in accordance with CEQA Guidelines Section 15064.7 does not require environmental review. This activity is not a project pursuant to State CEQA Guidelines Sections 15060(c)(3) and 15378. The establishment and implementation of a VMT threshold is a state-mandated requirement under SB 743 and Section 15064.3 of the CEQA Guidelines.

Attachments:
- Attachment A: Resolution Adopting VMT CEQA Transportation Threshold of Significance
- Attachment B: City of Palo Alto Local Transportation Impact Analysis Policy
- Attachment C: SB 743 Implementation Decisions for Palo Alto White Paper
Resolution of the Council of the City of Palo Alto Adopting California Environmental Quality Act (CEQA) Thresholds of Significance for Transportation Impacts in Compliance with SB 743

RECIPEALS

A. Senate Bill (SB) 743, signed into law in 2013 by Governor Edmund G. Brown, directed the Governor’s Office of Planning and Research (OPR) to develop updated criteria for measuring transportation impacts under the California Environmental Quality Act (CEQA) using alternative metrics that promote a reduction in greenhouse gases, the development of multimodal transportation, and a diversity of land uses, all towards achieving the State’s climate action goals.

B. OPR prepared proposed updates to the CEQA Guidelines and a Technical Advisory on Evaluating Transportation Impacts using vehicle miles traveled (VMT) as the metric to evaluate the transportation impacts of a project under CEQA. OPR’s CEQA Guidelines update was approved by the California Natural Resources Agency in November 2018 and the Governor’s Office of Administrative Law on December 28, 2018.

C. Section 15064.3 of the CEQA Guidelines, added as part of the 2018 update, identifies VMT as the most appropriate measure of transportation impacts under CEQA, and states that a project’s effect on automobile delay shall not constitute a significant environmental impact. Lead agencies are required to begin using the VMT metric by July 1, 2020.

D. The mandate on lead agencies in Section 15064.3 requires the City to update its CEQA transportation thresholds of significance.

E. CEQA Guidelines Section 15064.7(b) allows lead agencies to adopt thresholds of significance for the lead agency’s general use in its environmental review process.

F. On May 18, 2020, the Council held a study session to review the State requirements for the evaluation of projects for transportation impacts and to review the recommendations of staff and the City’s consultant Fehr & Peers regarding the revised CEQA thresholds. The Council discussed potential thresholds, screening criteria, and other matters related to the transition to use of the VMT metric for CEQA purposes, as well as the anticipated use of level of service (LOS) analysis for local transportation analysis separate from CEQA.

G. On June 15, 2020, the Council held a further public hearing on the proposed VMT thresholds of significance.

H. Notice of the project and public hearings was posted on the City’s website for both Council meetings. Evidence, both oral and written, was presented at the public hearings.
NOW, THEREFORE, the City Council of the City of Palo Alto does hereby RESOLVE as follows:

SECTION 1. The Council finds and determines, based upon staff and consultant reports and research as well as testimony in the record, that the revised CEQA thresholds of significance under consideration are consistent with State requirements as to how transportation impacts should be evaluated for purposes of CEQA review of projects. The revised thresholds are based upon the VMT metric that is specifically required in CEQA Guidelines Section 15064.3. Additionally, the City is setting the new CEQA thresholds at a level and in a manner consistent with and based upon review of OPR guidance.

SECTION 2. The adoption of new CEQA thresholds of significance for transportation impacts is consistent with the goals, objectives and policies of the Comprehensive Plan. Specifically, the new CEQA thresholds of significance for transportation impacts are consistent with Comprehensive Plan Land Use Element and Transportation Element goals and policies as follows:

i. GOAL T-1: Create a sustainable transportation system, complemented by a mix of land uses, that emphasizes walking, bicycling, use of public transportation and other methods to reduce GHG emissions and the use of single-occupancy motor vehicles.

ii. Policy T-1.3: Reduce GHG and pollutant emissions associated with transportation by reducing VMT and per-mile emissions through increasing transit options, supporting biking and walking, and the use of zero-emission vehicle technologies to meet City and State goals for GHG reductions by 2030.

iii. GOAL T-2: Decrease delay, congestion and VMT with a priority on our worst intersections and our peak commute times, including school traffic.

iv. Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.

v. Program T2.3.1: When adopting new CEQA significance thresholds for VMT for compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standards for MMLOS, which includes motor vehicle LOS, at signalized intersections.

vi. GOAL T-3: Maintain an efficient roadway network for all users.
vii. Policy T-3.3: Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with pedestrians and bicyclists.

viii. Policy L-1.9: Participate in regional strategies to address the interaction of jobs, housing balance and transportation issues.

ix. Policy L-2.3: As a key component of a diverse, inclusive community, allow and encourage a mix of housing types and sizes, integrated into neighborhoods and designed for greater affordability, particularly smaller housing types, such as studios, co-housing, cottages, clustered housing, accessory dwelling units and senior housing.

x. Policy L-2.4: Use a variety of strategies to stimulate housing, near retail, employment, and transit, in a way that connects to and enhances existing neighborhoods.

xi. Program L2.4.7: Explore mechanisms for increasing multi-family housing density near multimodal transit centers.

xii. Policy L-2.5: Support the creation of affordable housing units for middle to lower income level earners, such as City and school district employees, as feasible.

xiii. Policy L-4.2: Preserve ground-floor retail, limit the displacement of existing retail from neighborhood centers and explore opportunities to expand retail.

xiv. Policy L-4.5: Support local-serving retail, recognizing that it provides opportunities for local employment, reduced commute times, stronger community connections and neighborhood orientation.

xv. Program L4.5.1: Revise zoning and other regulations as needed to encourage the preservation of space to accommodate small businesses, start-ups and other services.

SECTION 3. Based upon the foregoing, the Council hereby adopts the revised CEQA Thresholds of Significance for Transportation Impacts and Screening Criteria for the City of Palo Alto, attached hereto as Exhibit A.
SECTION 4. This project is categorically exempt in accordance with CEQA Guidelines Section 15308 (Actions by a Regulatory Agency for Protection of the Environment). The revised CEQA thresholds comply with a State mandate (SB 743) and will be used in a regulatory process that involves procedures for the protection of the environment.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

__________________________________________  ____________________________
City Clerk                                  Mayor

APPROVED AS TO FORM:

__________________________________________  APPROVED:
Assistant City Attorney                     City Manager

__________________________________________
Chief Transportation Official
Consistent with State CEQA Guidelines Section 15064.3, the City of Palo Alto has adopted the thresholds of significance set forth in Table 1 to guide in determining when a project will have a significant transportation impact.

**Table 1: VMT Thresholds of Significance by Project Type**

<table>
<thead>
<tr>
<th>Land Use/Project Type</th>
<th>Threshold of Significance</th>
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<td>Residential Projects</td>
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<td>Office Projects</td>
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<td>Retail Projects</td>
<td>A proposed project that results in a net increase in total (boundary) VMT may indicate a significant transportation impact.</td>
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<td>Mixed-Use Projects</td>
<td>Each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).</td>
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<td>Other Project Types</td>
<td>The City will either develop an ad hoc (i.e., project-specific) VMT threshold for a unique land use type or apply the most applicable of the above thresholds depending on project characteristics.</td>
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<td>Redevelopment Projects</td>
<td>Where a proposed project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project may cause a less than significant transportation impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant transportation impact if proposed new residential, office, or retail land uses would individually exceed their respective thresholds.</td>
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Certain projects may qualify for vehicle miles traveled (VMT) screening based on the criteria presented in Table 2. Projects screened from requiring a VMT analysis would not have an impact under State CEQA Guidelines section 15064.3
Table 2: Screening Criteria

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<td>Small Developments</td>
<td>Projects that generate fewer than 110 trips per day. This may equate to non-residential projects of 10,000 sq. ft., or less and residential projects of 20 units or less.</td>
</tr>
<tr>
<td>Projects in Low-VMT Areas</td>
<td>Residential and office projects located in low-VMT areas(^1) that have similar features (i.e., density, mix of uses, transit accessibility) as existing developments in these areas.</td>
</tr>
<tr>
<td>Projects in Proximity to Major Transit Stops</td>
<td>Projects that are located within a half mile of an existing or planned high-quality transit corridor or major transit stations, and meet the following additional criteria: (1) is high density (minimum floor area ratio of 0.75), (2) does not exceed parking requirements, (3) is consistent with Plan Bay Area 2040 (<a href="http://2040.planbayarea.org/">http://2040.planbayarea.org/</a>), and (4) does not replace affordable units with smaller numbers of moderate- or above moderate-income units.</td>
</tr>
<tr>
<td>Affordable Housing</td>
<td>100% affordable housing projects in infill locations.</td>
</tr>
<tr>
<td>Local-Serving Retail</td>
<td>Retail projects of 10,000 sq. ft. or less.(^1)</td>
</tr>
<tr>
<td>Transportation Projects</td>
<td>Roadway, transit, bicycle and pedestrian projects that do not lead to a measurable increase in vehicle travel.</td>
</tr>
</tbody>
</table>

\(^1\) Residential projects located in areas where baseline VMT is 15% below the existing county average per resident, and office projects located in areas where baseline VMT is 15% below the existing regional average per employee could be considered to be in low-VMT areas and presumed to have a less than significant VMT impact.
Senate Bill (SB) 743, adopted in 2013, required the Governor’s Office of Planning and Research (OPR) to prepare amendments to the CEQA Guidelines with respect to the analysis of potential transportation effects to provide an alternative metric to traffic congestion and delay at intersections (often referred to as Level of Service (LOS)). After five years of analysis and outreach, in December 2018, the California Natural Resources Agency approved OPR’s proposed amendments to the CEQA Guidelines requiring agencies to use vehicle miles traveled (VMT) generated by a project as the metric for transportation impact analyses under CEQA effective July 1, 2020. Under SB 743 and the revised CEQA Guidelines, LOS may no longer be used to determine whether a project may have a significant environmental impact to transportation and traffic under CEQA.

While statewide implementation of VMT analysis to replace LOS analysis is required under CEQA, SB 743 did not require changes to transportation analyses outside of CEQA, including the evaluation of regionally significant intersections under the Congestion Management Program (CMP) under a separate state law. Nor did SB 743 affect the discretion of public agencies to assess impacts on local streets and intersections for compliance with adopted plans and policies. As such, in conformance with Policy T-2.3 and Program T-2.3.1 of the City’s Comprehensive Plan 2030,1 LOS standards are adopted through this policy to analyze potential local transportation impacts of projects in Palo Alto.

I. Purpose

The purpose of this Policy is to ensure consistency in reviewing and identifying transportation effects of proposed development projects for local intersections and facilities and to determine standards for necessary remediation measures.

---

1 Comprehensive Plan Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.

Program T-2.3.1: When adopting new CEQA significance thresholds for VMT for compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standards for MMLOS, which includes motor vehicle LOS, at signalized intersections.

Policy T-2.4: Consistent with the principles of Complete Streets adopted by the City, work to achieve and maintain acceptable levels of service for transit vehicles, bicyclists, pedestrians and automobiles on roads in Palo Alto, while maintaining the ability to customize to the Palo Alto context.

Policy T-3.3: Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists.
II. Level of Service (LOS) Analysis

LOS is the measurement of delay at intersections used to determine whether a project is consistent with the City’s Comprehensive Plan and this Policy LOS is based on the Highway Capacity Manual (HCM) methodology where a letter grade is assigned to an intersection operation based on the amount of delay motorists experience in traveling through the intersection. Table 1 below shows the comparison in LOS depending on whether the intersection is signalized or not.

<table>
<thead>
<tr>
<th>Level of Service Grade</th>
<th>Description</th>
<th>Signalized Average Delay (Sec)</th>
<th>Unsignalized Average Delay (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Signal Progression is extremely favorable. Little or no traffic delay.</td>
<td>10.0 or less</td>
<td>10.0 or less</td>
</tr>
<tr>
<td>B</td>
<td>Operations characterized by good signal progression and/or short cycle lengths. Short traffic delays.</td>
<td>10.1 to 20.0</td>
<td>10.1 to 15.0</td>
</tr>
<tr>
<td>C</td>
<td>Higher delays may result from fair signal progression. Average traffic delays.</td>
<td>20.1 to 35.0</td>
<td>15.1 to 25.0</td>
</tr>
<tr>
<td>D</td>
<td>Congestion becomes noticeable. Long traffic delays.</td>
<td>35.1 to 55.0</td>
<td>25.1 to 35.0</td>
</tr>
<tr>
<td>E</td>
<td>Considered the limit of acceptable delay.</td>
<td>55.1 to 80.0</td>
<td>35.1 to 50.0</td>
</tr>
<tr>
<td>F</td>
<td>Level of delay is considered unacceptable by most drivers. Extreme traffic delays.</td>
<td>Greater than 80.0</td>
<td>Greater than 50.0</td>
</tr>
</tbody>
</table>

Source: Transportation Research Board, Highway Capacity Manual 2010

III. Standards for Determining Transportation Analysis

1. Within the CMP System

Traffic Impact Analysis (TIA) reports vary in scope depending on the use of the report and size of the project.

Under the purview of the California Congestion Management Program (CMP) Statute, Palo Alto must follow the methodologies presented in the VTA Transportation Impact Analysis Guidelines for intersections within the CMP system, to evaluate transportation effects and submit a full TIA report of all development projects that are expected to generate 100 or more net new weekday (AM or PM peak hour) or weekend peak hour trips, including both inbound and outbound trips.
CMP intersections within Palo Alto are listed below. A map of all CMP intersections can be found in Attachment A.

i. Middlefield Rd./Oregon Exp.
ii. Middlefield Rd./San Antonio Rd.
iii. El Camino Real/University Ave./Palm Dr.
v. El Camino Real/Embarcadero Rd.
vi. El Camino Real/Page Mill Rd.
vii. El Camino Real/Arastradero Rd./Charleston Rd.
viii. Foothill Exp./Junipero Serra Blvd./Page Mill Rd.
ix. Foothill Exp./Arastradero Rd.
x. San Antonio Rd./Charleston Rd.

2. **Outside the CMP System**

The City requires a Local Transportation Analysis (LTA) report for any project that is expected to generate 50 or more net new weekday (AM or PM peak hour) trips, including both inbound and outbound trips, prior to any reductions assumed for Transportation Demand Management (TDM) measures. The City may also require a LTA if in its reasonable judgement a project will potentially cause a deficiency in the operation of local intersections. A LTA report must include the following:

i. Project description;
ii. Existing conditions;
iii. Site access and circulation;
iv. Vehicle trip generation (weekday AM and PM peak);
v. Vehicle trip distribution; and
vi. Remediation measures (if proposed)

Depending on the size and layout of the project, additional elements listed below may be required by the City to include in the LTA report.

i. **Traffic Infusion on Residential Environments (TIRE) Analysis** is an analysis of new potential traffic disturbances along a local residential street created by a project as described in the Attachment B. When a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street that is not on a project’s direct route to collector or arterial streets, the project is required to submit a TIRE analysis.

ii. **Queuing Analysis** that identifies queues spilling beyond their current storage bays. Improvements may include lengthening storage bays to meet projected demand or roadway capacity improvements to add additional turn pockets at
an intersection. The City typically takes the lead in identifying potential capacity improvements to help facilities site design.

iii. **Transit Analysis** for projects located along a key transit route, such as El Camino Real, a focused analysis in partnership with the VTA or other transit operators is provided to determine if off-site improvement of a project should consider additional parking stop improvements such as shelters or bus duck-outs.

iv. **Bicycle and Pedestrian Circulation Study** is an analysis of how the site operations may affect bicycle and pedestrian operations. Where appropriate, if a project is located along a major bicycle route in the City’s *Bicycle & Pedestrian Transportation Plan*, the project may be required to help implement a portion of the recommended facility. Additional improvements may include limiting driveway curb-cuts to minimize conflicts with pedestrians or provision of enhanced crosswalk facilities.

v. **Parking Analysis** is a study to determine location, use, and adequacy of the proposed parking facility. Projects should include a parking analysis under the following conditions:

   a. Change in the facilities’ existing design or supply; or
   b. Change in the existing parking management; or
   c. Propose parking less than that required by the Palo Alto Municipal Code 18.52 ([https://tinyurl.com/PA-Municipal-Code](https://tinyurl.com/PA-Municipal-Code)); or
   d. Use of parking adjustments by the Director as defined in the Palo Alto Municipal Code 18.52 ([https://tinyurl.com/PA-Municipal-Code](https://tinyurl.com/PA-Municipal-Code)).

When a proposed project requests a parking reduction or exception as allowed under the Municipal Code, a robust Transportation Demand Management (TDM) Plan is typically required independent of the LTA. For projects in a Parking Assessment District, required payment of assessments to the District will be noted in the LTA report and included in the project’s conditions of approval.

A project will provide an analysis of one or more of the above elements if the project is expected to substantially affect the identified local facilities, even if the anticipated number of new vehicle trips would not require a LOS analysis.
IV. Local Transportation Impacts – Standards for Determining Transportation Consistency

1. Level of Service Standard

The City of Palo Alto’s Level of Service (LOS) standard is D, which is more conservative than the CMP LOS standard of E. If the LTA shows that a development project is anticipated to cause a transportation facility (intersection or roadway) to degrade below LOS D to LOS E or F, then the project will be deemed inconsistent with this Policy.

For a transportation facility determined to have been at LOS E or F under existing and background conditions without the project, a project is said to have significant local impact if the LTA shows that the project will cause LOS to deteriorate by the following amounts:

i. Addition of project traffic increases the average delay for critical movements by four or more seconds; or
ii. Addition of project traffic increases the critical Volume/Capacity (V/C) value by 0.01 or more; or
iii. Affects a freeway segment or ramp to operate at LOS F or project traffic increases freeway capacity by one or more percent.

2. Selection of Study Intersections or Roadways

An intersection should be included in the LTA if it meets any one of the following conditions:

i. Proposed development project is expected to add 10 or more peak hour vehicles per any lane to any intersection movement; or
ii. The intersection is adjacent to the project; or
iii. Based on engineering judgement, City staff determines that the intersection should be included in the analysis.

Additionally, a roadway segment should be included in the LTA with a TIRE analysis if a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street. More details on the TIRE analysis are available in Attachment B.
3. **CMP Intersection Standard**

A CMP intersection must adhere to the standards set by the Congestion Management Agency\(^2\) (currently LOS E), as set forth in the *VTA Transportation Impact Analysis Guidelines*. The City’s standard of LOS D would apply for determining local level impacts. Any transportation impact triggered by VTA’s standard for CMP intersections would need to be addressed following guidelines established by VTA. More information regarding mitigation measures and Multimodal Improvement Plans (MIP) are available in the VTA Guidelines for TIAs and Deficiency Plans.

4. **Auto Level of Service Analysis at Unsignalized Intersections**

For all-way stop control, the LOS is based on the average delay. For 1- or 2-way stop control, the LOS should be based on the critical approach movement. The above standards for determining transportation consistency remain appropriate only if traffic volumes satisfy the peak hour traffic signal warrant. Meeting a peak hour traffic signal warrant does not automatically make a traffic signal an appropriate remediation measure.

5. **Other Transportation Impacts**

Depending on the size and layout of the project, a LTA may require analysis to evaluate other project-related effects on the transportation system. The following is a list of elements that are considered to have project-related local impacts:

i. Result in noticeable traffic effects on local residential streets defined as an increase of 0.1 or more using the TIRE methodology.

ii. Impede the development or function of existing or planned pedestrian or bicycle facilities.

iii. Increase demand for pedestrian or bicycle facilities that cannot be met by existing or planned facilities.

iv. Impede the operation of a transit system as a result of increased traffic congestion.

v. Create demand for transit services that cannot be met by current or planned services.

vi. Create the potential demand for cut-through traffic or redistribution of traffic to use local residential streets, based on the TIRE methodology described above.

vii. Create an operational safety hazard.

viii. Result in inadequate emergency access.

---

\(^2\) The Santa Clara Valley Transportation Authority (VTA) is the Congestion Management Agency (CMA) for Santa Clara County.
V. Remediation Measures

All Local Transportation Impacts under Section VI of this Policy must be addressed through the project’s adoption or use of appropriate local remediation measures, including funding their associated costs. The LTA must include proposed remediation measures and identify any potential impacts of such measures. Remediation measures shall reduce the project-related local impacts to a level without the proposed project, and should not themselves create potentially significant CEQA impacts. These remediation measures will be incorporated in the project conditions of approval and not as part of the CEQA analysis. The following is a list of potential remediation methods in priority order:

1. Projects and programs that reduce a project’s vehicle trip generation, including, but not limited to Transportation Demand Management (TDM) programs, capital improvements to transit, bicycle, and pedestrian facility enhancements within an influential project area. The following is a non-exhaustive list of potential remediation methods:
   i. Provide new or upgrade existing access to, from, and through the project for pedestrians and bicyclists.
   ii. Provide improvements to transit facilities or services.
   iii. Implement TDM programs such as flexible at-place working hours, telecommuting, carpoools, shuttles, transit passes, parking cash-out, among others.

2. Multimodal operational or facility improvements including intersection operational efficiency treatments. Proposed improvements or treatments with geometric changes to an intersection are limited to features that would not likely lead to substantial or measurable increase in vehicle travel.

3. If project impacts cannot be remediated through methods 1 and 2 above, a fair share of the cost for multimodal network remediation shall be contributed to the City’s transportation improvement funds.

While the remediation measures in method 1, above, should be proposed within an influential project area, methods 2 and 3 may apply outside the area. However, these proposed improvements should substantially contribute to the City’s Comprehensive Plan goals in expanding the City’s multimodal transportation system. By implementing or funding these types of improvements, the project would therefore be consistent with the Comprehensive Plan and this Policy.

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3 Area of influence of a project is defined as up to half-mile for pedestrian facilities and up to three miles for bicycle facilities, or bicycle facilities that provide a connection to the local or regional bicycle network.
**Unacceptable Measures**

In addition, remediation measures that will result in a physical reduction in the capacity and/or deterioration in the quality of any existing or planned transportation facilities are unacceptable. The following is a list of remediation methods that would be considered generally unacceptable without special justification, but are not limited to:

1. Roadway widening not directly related to site access and circulation, or specific conditions that reduce local impacts as a result of the project.
2. Negatively affecting a sidewalk or reducing the width of a sidewalk without substantial improvement to the overall pedestrian circulation.
3. Maintaining an existing sidewalk in the immediate vicinity that is below the current city standard.
4. Negatively affecting existing bicycle infrastructure or reducing the length of a bicycle infrastructure.
5. Maintaining existing bicycle infrastructure that is below the current city standard.
6. Eliminating a bus stop without adequate replacement or improvement to the system.
7. Encouraging neighborhood cut-through traffic (intrusion effects along local residential streets).

**VI. Authority to Adopt Guidelines**

The Chief Transportation Official is authorized to adopt guidelines to implement this Policy.
ATTACHMENT A
CONGESTION MANAGEMENT PROGRAM INTERSECTIONS

Source: Santa Clara Valley Transportation Authority Congestion Management Program Document 2017
ATTACHMENT B
CITY OF PALO ALTO – TRAFFIC INFUSION ON RESIDENTIAL ENVIRONMENTS (TIRE) ANALYSIS

Excessive vehicular speed and traffic volume on residential streets pose a major threat to quality of life. Most Palo Alto streets are bordered by residential uses, and it is the City’s priority to preserve local neighborhood characteristics. Additionally, the City has designated some streets as residential arterials to recognize that they carry large traffic volumes of through-traffic but also have residential uses on both sides of the streets. The objective of this analysis is to address the desires of residents of these streets who prefer slower vehicular speeds and to determine if implementation of a project would cause a substantial change in the character of these streets.

The City of Palo Alto uses the Traffic Infusion on Residential Environments (TIRE) methodology to estimate residential perception of traffic effects based on anticipated average daily traffic growth. Although not required under the California Environmental Quality Act (CEQA) or pursuant to the Santa Clara Valley Transportation Authority (VTA) guidelines, this methodology intends to determine new potential traffic disturbances – cut-through traffic (intrusion effects) and direct traffic (infusion effects) – along local residential streets due to a proposed development project.

For projects on a local residential street, new traffic disturbances along that specific street will likely be unavoidable. Thus, the potential infusion effects generated along a specific local residential street of which a project is proposed will be used only for informational purposes. A map of Palo Alto’s local residential streets can be found in Map 1 in this attachment.

The City aims to reduce potential adverse intrusion effects along local residential streets. Significant amount of vehicle intrusion on these streets may need to be addressed through traffic management strategies.

Traffic Infusion on Residential Environments (TIRE) Index
The TIRE methodology assigns a numerical value to “residents’ perception of traffic effects on activities such as walking, bicycling, and maneuvering out of a driveway on local residential streets.” The TIRE index scale ranges from 0 to 5 depending on daily traffic volume. An index of 0 represents the least traffic disturbances and 5 the greatest, and thereby, the poorest residential environment. Streets with a TIRE index of 3 and above are considered to function primarily as a traffic street and exhibit an impaired residential environment. Therefore, streets with a TIRE index below 3 are better suited for residential activities.

Any projected change in the TIRE index of 0.1 or less is considered to have no noticeable effects. A change of 0.1 would be barely noticeable, and a change of 0.2 or greater would be noticeable. The TIRE Index can be found in Table 1 in this attachment.
I. Standards for Determining Analysis
A proposed development project expecting to add 10 or more peak hour vehicles per any direction to a local residential street.

II. Selection and Data Collection of Roadway Segments
Roadway segments should be included in the LTA if a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street. Data collected under the TIRE methodology must be supported by 24-hour weekday traffic counts.

For projects on a local residential street including both single- or multi-family, as defined in the City’s Comprehensive Plan 2030, the TIRE analysis must include the following:

1. Direct routes to the project;
2. Immediate connections to a project’s direct collector or arterial streets; and
3. Based on engineering judgement, City staff determines what roadway segments should be included in the analysis.

A Palo Alto land use map can be found in Map 2 in this attachment.

III. Standards for Determining Noticeable Effect
Projected change in the TIRE index of 0.1 or more under existing and background conditions, is considered to cause noticeable effects on the character of local residential streets. These traffic effects may need to be addressed through traffic management strategies.
Table 1: Traffic Infusion on Residential Environments (TIRE) Index

<table>
<thead>
<tr>
<th>TIRE Index</th>
<th>Existing Daily Traffic Volume</th>
<th>Volume to Cause +0.1 Change in TIRE Index</th>
<th>Volume to Cause +0.2 Change in TIRE Index</th>
<th>Volume Description</th>
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<tbody>
<tr>
<td>1.5</td>
<td>29-35</td>
<td>6</td>
<td>15</td>
<td>Low</td>
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<tr>
<td>1.6</td>
<td>36-44</td>
<td>8</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>45-56</td>
<td>10</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>57-70</td>
<td>13</td>
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<td></td>
</tr>
<tr>
<td>1.9</td>
<td>71-89</td>
<td>17</td>
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<tr>
<td>2.0</td>
<td>90-110</td>
<td>22</td>
<td>52</td>
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<td>2.1</td>
<td>111-140</td>
<td>29</td>
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<td>181-220</td>
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<td>2.4</td>
<td>221-280</td>
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<td>351-450</td>
<td>94</td>
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<td>2.7</td>
<td>451-560</td>
<td>114</td>
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<td>2.8</td>
<td>561-710</td>
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<td>711-890</td>
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<td>891-1,100</td>
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<td>1,801-2,200</td>
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<td>71,001-89,000</td>
<td>18,000</td>
<td>43,000</td>
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Source: Goodrich Traffic Group
Map 1  City of Palo Alto Local Residential Streets

Source: City of Palo Alto Comprehensive Plan 2030
Map 2: City of Palo Alto Comprehensive Plan 2030 Land Use Designations

Source: City of Palo Alto Comprehensive Plan 2030
SB 743 Implementation
Decisions for Palo Alto

Prepared for:
City of Palo Alto

June 1, 2020

SF20-1094

Fehr & Peers
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Executive Summary

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

As a result of changes to the CEQA Guidelines, there are several changes in general transportation impact analysis metrics, methods, and thresholds. The purpose of this white paper is to help the City of Palo Alto (“City”) meet the new requirements of CEQA under SB 743 by providing curated SB 743 implementation information that includes substantial evidence to support decisions for VMT metrics, VMT calculation methods, VMT impact thresholds, and VMT mitigation actions for use by the City. As a lead agency, the City will need to make several policy decisions to implement these changes and this report provides detailed technical information concerning each change area. The Summary of Decisions, Options, and Recommendations, presented as Appendix A, provides an overview of this white paper’s contents and corresponding decisions.

Background

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

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

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

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

However, VMT does not accurately predict changes such as increased delay at intersections near a project, or how traffic will affect roadways immediately surrounding a project, in the same way traditional traffic...
analysis would. It is more focused on how efficiently designed and located a land use project might be; whether the project is located near a wide variety of jobs, housing, or retail uses; and whether alternative modes of transportation are available.

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

Because reporting the VMT associated with a given project or plan requires a different method than traditional traffic analysis, the City will need to set clear guidelines and expectations for how a VMT analysis should be conducted. With the CEQA Guidelines expectations for an environmental impact analysis in mind, this white paper discusses seven questions, grouped by the specific decisions about VMT metrics, VMT calculation methods, VMT significance thresholds, and VMT mitigation actions. We highlight options and limitations for each question from a technical transportation planning and engineering perspective, with a particular emphasis on addressing the CEQA Guidelines expectations for an environmental impact analysis.

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

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

**VMT Metrics**

**VMT Measured and Expressed in Multiple Ways**

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

**Table ES-1** summarizes the common VMT metrics available.

---

1 Typical CEQA practice focuses on environmental effects that occur on a typical weekday, so all references to VMT in this white paper are intended to mean VMT that occurs on a typical weekday.
Table ES-1: Summary of Common VMT Metrics

<table>
<thead>
<tr>
<th>VMT Metric1</th>
<th>Definition</th>
<th>Recommended by OPR2</th>
<th>VMT Used for Other CEQA Sections?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Project Generated VMT</td>
<td>Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, presented as a total project generated VMT.</td>
<td>Yes, for land use plans, and discussed in Appendix 1 of the OPR Technical Advisory.</td>
<td>Yes</td>
</tr>
<tr>
<td>Total Project Generated VMT per Service Population3, 4 (aka Total Project Generated VMT Rate)</td>
<td>Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, divided by the sum of residents plus employees.</td>
<td>No, although may be helpful for mixed-use projects and comparing land use scenarios, particularly when using a travel forecasting model.</td>
<td>Yes</td>
</tr>
<tr>
<td>Partial Home-Based VMT per Resident5 (aka Home-Based VMT Rate)</td>
<td>VMT generated by light-duty vehicles for all trips that begin or end at a residential land use, divided by residents.</td>
<td>Yes, for residential projects on page 5 and Appendix 1 of OPR Technical Advisory.</td>
<td>No</td>
</tr>
<tr>
<td>Partial Home-Based Work VMT per Employee5 (aka Home-Based Work VMT Rate)</td>
<td>VMT by light-duty vehicles only for work trips (that is, trips that have one end at a workplace and one end at a residence), divided by number of employees.</td>
<td>Yes, for office projects on page 6 and Appendix 1 of OPR Technical Advisory.</td>
<td>No</td>
</tr>
<tr>
<td>Project’s Effect on VMT within the Boundary of a Specific Area (aka Boundary VMT)</td>
<td>VMT that occurs within a selected geographic boundary (e.g., City, County, or region) by any type of vehicle. This captures all on-road vehicle travel on a roadway network for any purpose and includes local trips as well as trips that pass through the area without stopping.</td>
<td>Yes, for retail projects and transportation projects on pages 5, 6 and 23 and Appendix 1 of the OPR Technical Advisory.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

Total VMT and Partial VMT

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

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

Project Generated VMT and Project’s Effect on VMT

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

Key Take-Aways

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

1. Total Project Generated VMT
2. Total Project Generated VMT per Service Population²

² Service population includes residential population plus employment and may include students or visitors; it is intended to include all independent variables used in estimating trips.
3. Household Generated VMT per Resident (requires an activity/tour-based travel forecasting model)
4. Home-Based VMT per Resident (a partial VMT estimate)
5. Home-Based Work VMT per Employee (a partial VMT estimate)
6. Project’s Effect on VMT within the Boundary of a Specific Area (Boundary VMT)

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

**VMT Calculation Methods**

**VMT Calculation Using Several Methods**

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

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

**Key Take-Aways**

Practically speaking, the use of a travel model is preferable for projects large enough to be accurately represented in that model. In areas under the City of Palo Alto’s jurisdiction, use of the VTA travel model is
most appropriate for this analysis. **Appendix B** summarizes the activity-based (also called tour-based) Metropolitan Transportation Commission (MTC) travel forecasting model and the trip-based VTA-C/CAG Bi-County travel forecasting model ("VTA travel forecasting model"), including their analytical strengths and weaknesses.

Some limitations of these methods include the following:

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

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

**VMT Impact Significance Thresholds**

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

SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts to drivers, to measuring the impact of driving. A lead agency has discretion to set its significance threshold for VMT impacts, provided that the basis for that threshold is grounded in substantial evidence. With regard to establishing thresholds for VMT, lead agencies have at least four options:

1. **Use Screening Criteria.** The concept of project screening is that some projects have characteristics that readily lead to the conclusion that they would not cause a VMT impact, and therefore could be screened out of doing a detailed VMT analysis. Some types of screening criteria include transit proximity, low-VMT area, local-serving retail, transportation projects that do not add capacity, and projects with no net VMT increase.

2. **Rely on the OPR Technical Advisory suggestion to set thresholds consistent with state goals for air quality, greenhouse gas (GHG), and energy conservation.** The OPR Technical Advisory contains suggested VMT thresholds. The basic suggested threshold is that each project achieves a VMT level that is at least 15% below baseline conditions. In the case of a jurisdiction, its "region" would most likely be the nine-county Bay Area.

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

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

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

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

4. **Develop City-specific VMT thresholds consistent with the existing Comprehensive Plan.** Agencies may decide to set their own thresholds, which must be supported by substantial evidence and should support the three objectives laid out in SB 743: 1) reducing GHG emissions, 2) encouraging infill development, and 3) promoting active transportation. The process of setting thresholds should consider the policies and standards set in the Regional Transportation Plan (RTP)/ Sustainable Communities Strategies (SCS), and should consider how much priority a jurisdiction wants to place on the statewide GHG reduction goals. A targeted study could determine what level of VMT in a jurisdiction would be consistent with the VMT forecasts presented in Plan Bay Area and would represent a jurisdiction’s “fair share” of the State’s GHG reduction goals. Another option for setting a local threshold is to consider what level of VMT reduction is feasible to achieve in the local context.
Key Take-Aways

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

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

VMT Mitigation Actions

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

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

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

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

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

**Implementation Actions**

**The City will need to take administrative action to prepare for changes to CEQA analysis.**

The options in this white paper are intended to assist the City with developing a contextual implementation approach. This will likely require public input from elected or appointed policy-makers to balance community values with CEQA requirements. The City may decide to set a VMT threshold that is consistent with its Comprehensive Plan VMT growth budget or could select the screening approach described in the OPR *Technical Advisory*. Each agency has the discretion and responsibility to develop its own VMT methods for various project types, and sizes.

**Use of Vehicle Level of Service for Non-CEQA Analysis**

**The City has options to continue studying a project’s effects on vehicle delay.**

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

The City may decide to maintain a level of service standard and may continue to administer programs to collect impact fees that can be used for roadway improvements. However, these will no longer be subject to CEQA-level review and litigation. Instead, this analysis and any related agreements would need to be performed and presented during entitlements or development review. Any fees assessed to help ease the effects of a given project would be required to conform to State requirements for impact fees and present an appropriate study that identifies nexus between the impact and the fee assessed.
Other Core CEQA Tenets Remain Unchanged.

While this report focuses on the adoption of VMT as a metric for assessing transportation impacts, many other facets of CEQA practice remain unchanged. Transportation impact sections must still discuss other impact categories such as hazards, effects on pedestrians and cyclists, and site circulation concerns. In addition, the City will continue to have the opportunity to comment on EIRs prepared for consideration by other lead agencies if those EIRs may affect the City.

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

Taking the Next Steps

As a lead agency, the immediate next steps for the City of Palo Alto are to develop its VMT thresholds and provide staff and applicants with guidance pertaining to each of the questions posed above. This white paper provides an initial assessment of the City’s options and includes draft recommendations in Chapter 7; however, the decision on how to answer each implementation question must ultimately be made by the City. The Summary of Decisions, Options, and Recommendations, presented as Appendix A, provides an abbreviated overview of this report’s contents and corresponding action items and decision points.

The implementation of SB 743 is just beginning for many lead agencies. Current CEQA practices have developed over several decades, incorporating a large body of case law and periodic updates to the CEQA Guidelines. Because SB 743 implementation is brand new, there is not yet any case law to guide our understanding or interpretation. This white paper represents our current understanding of the options, limitations, and considerations, informed by our research into SB 743 and knowledge of past CEQA practice; this understanding will evolve over time as more agencies apply SB 743 concepts to their own CEQA procedures.
Chapter 1. Introduction

This white paper provides a summary of key information relevant to how Senate Bill 743 (SB 743) will be implemented in the City of Palo Alto (“City”). It begins with an introduction on the background and purpose of SB 743, and then provides a summary of policy actions required of the City, along with discussion of process guidance from state agencies.

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

Under CEQA, lead agencies must decide what constitutes a significant environmental impact. The CEQA Guidelines encourage the use of thresholds of significance; they can be quantitative or qualitative performance standards by which the agency can measure the amount of impact the project causes and thereby determine if the project’s impacts are significant. In fact, the new CEQA Guidelines Section 15064.3(b)(4) (cited below) establishes that the lead agency has discretion to choose the most appropriate VMT methods for transportation impact analysis.

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

\(^3\) VMT refers to “Vehicle Miles Traveled,” a metric that accounts for the number of vehicle trips generated as well as the length or distance of those trips. VMT is an accessibility performance metric that evaluates the changes in land use patterns, regional transportation systems, and other built environment characteristics, which is different from what the mobility performance metric vehicle level of service measures – vehicle mobility. The white paper will use the terms project generated VMT and project’s effect on VMT using boundary VMT metrics for specific geographic areas. Project generated VMT is the sum of the “VMT from” and “VMT to,” and within a project site. Project’s effect on VMT uses geographic boundary VMT to evaluate the change in VMT on all roadways without and with the project within a specific geographic area.
The expectations for environmental impact analysis highlighted within the CEQA Guidelines are listed below.

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

With the CEQA Guidelines expectations for an environmental impact analysis in mind, this white paper discusses seven questions, grouped by the specific decisions about VMT metrics, VMT calculation methods, VMT significance thresholds, and VMT mitigation actions. We highlight options and limitations for each question from a technical transportation planning and engineering perspective with a particular emphasis on addressing the CEQA Guidelines expectations for an environmental impact analysis.

For simplicity, a Decisions, Options, Considerations, and Recommendations matrix accompanies this white paper as Appendix A and summarizes the seven questions mentioned above.

**Approach**

The purpose of this white paper is to help the City meet the new requirements of CEQA under SB 743 by providing curated SB 743 implementation information that includes substantial evidence to support decisions for VMT metrics, VMT calculation methods, VMT impact thresholds, and VMT mitigation actions for use by the City. Because VMT is also used as an input for air quality, greenhouse gases, and energy consumption impact analyses in CEQA, the white paper will also discuss how VMT significance thresholds affect other aspects of the CEQA process.

For each of the seven questions, there are three separate categories of projects that are subject to CEQA review and for which VMT evaluation will be needed. The City will need to address how each of these three project categories will be evaluated, and consider all three project types when responding to policy questions:

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

4 Typical CEQA practice focuses on environmental effects that occur on a typical weekday, so all references to VMT in this white paper are intended to mean VMT that occurs on a typical weekday.
The implementation of SB 743 is just beginning for many lead agencies. Current CEQA practices have developed over several decades, incorporating a large body of case law and periodic updates to the CEQA Guidelines. Because SB 743 implementation is brand new, there is not yet any case law to guide our understanding or interpretation. This white paper represents our current understanding of the options, limitations, and considerations, informed by our research into SB 743 and knowledge of past CEQA practice; this understanding will evolve over time as more agencies apply SB 743 concepts to their own CEQA procedures.

Outline

This report includes a background discussion about SB 743 and then transitions to the five sections: Background, VMT Metrics, VMT Calculation Methods, VMT Significance Thresholds, and VMT Mitigation Actions. The white paper is outlined below.

- **Chapter 2: Background.** A background discussion of transportation analysis before and after SB 743 implementation to provide context for the decisions in the following sections. This section will also include a summary of relevant local land use and transportation polices planning documents, including Plan Bay Area 2040 and the Comprehensive Plan.

- **Chapter 3: VMT Metrics.** As a lead agency, the City has the discretion to choose the most appropriate methods to evaluate a project’s VMT, including how the results of that method are expressed. Generally, VMT is expressed in several ways: total project generated VMT, project generated rates (total project generated VMT per service population or partial project generated VMT per resident/per employee), in total (all VMT associated with a project or plan), or as the net “effect” a project will have on VMT (listed as project’s effect on VMT). This section will describe the benefits and shortcomings of each metric.

  - Question 1: What form of VMT metrics could be used? 5
    - Total project generated VMT
    - Project generated VMT rates
      - Total project generated VMT per service population
      - Partial project generated VMT per resident (per employee)
    - Project’s effect on VMT (within a selected geographic boundary)

- **Chapter 4: VMT Calculation Methods.** VMT forecasts are generated using various forms of models that range from simple spreadsheets (off-model) based on historic traffic growth trends to complex computer models that account for numerous factors that influence travel demand. In some cases, VMT can be estimated using sketch models or spreadsheet tools. VMT can also be estimated directly by multiplying the number of trips by an average trip length. Given the availability of two travel forecasting modes, the white paper will provide each agency with a

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5 Each VMT metric will be defined in the white paper.
review of Metropolitan Transportation Commission (MTC) and the Santa Clara County Valley Transportation Authority (VTA) travel forecasting models for VMT calculations in Santa Clara County, including analytical strengths and weaknesses of each option.

- **Question 2: What methods are available to use in estimating and forecasting VMT?**
  - Select a non-model “accounting method” or a travel forecasting model for estimating and forecasting VMT at a regional, county, and/or local geographic area.

- **Chapter 5: VMT Impact Significance Thresholds.** Each lead agency has discretion to choose its threshold of significance for identifying a VMT impact. The intent of a VMT threshold is to identify whether a project has substantial environmental impacts due to traffic (such as noise, air, pollution, and safety concerns), and whether a project balances the needs of congestion management with statewide goals, such as the promotion of infill development. This chapter will also discuss the opportunity for “screening” projects in low VMT or transit priority areas. This chapter will describe possible thresholds and summarize the supporting evidence for each.

- **Question 3: Is the use of VMT impact screening desired?**
  - Projects located near frequent and high capacity transit
  - Projects located in low-VMT generating area
  - Local-serving retail projects
  - Specific transportation projects
  - Projects with no net VMT increase
  - Small projects

- **Question 4: What is the VMT impact significance threshold for land use projects and land use plans under baseline conditions?**
  - Set a threshold consistent with state goals for air quality, greenhouse gas, and energy conservation.
  - Set a threshold consistent with the Comprehensive Plan or the Sustainability and Climate Action Plan (S/CAP)

- **Question 5: What is the VMT impact significance threshold for land use projects under cumulative conditions?**
  - Fair share of regional VMT allocation
  - Cumulative VMT thresholds similar to baseline VMT thresholds
  - Long-term air quality and greenhouse gas expectations

- **Question 6: What is the VMT impact significance threshold for transportation projects under baseline conditions?**
  - Consider transportation project screening criteria and Caltrans’ pending VMT threshold.
• **Chapter 6: VMT Mitigation Actions.** The City will also need to determine if projects will be able to mitigate significant VMT impacts, and whether those measures can reduce the severity of a potential VMT impact. This chapter will include a review of how other jurisdictions have incorporated transportation demand management into their VMT mitigation measures for VMT impacts, and a discussion of the potential risks and uncertainties related to VMT mitigation measures. This white paper will also discuss program-based VMT mitigation approaches which may be more effective than project-site only strategies and provide a way for development contributions to be pooled to pay for VMT reduction strategies that would not be feasible for individual projects to implement.

  ◦ **Question 7:** What VMT reduction mitigation strategies are feasible?

    ▪ Possible options include a VMT cap, VMT fee, VMT bank, and VMT exchange.

• **Chapter 7: Implementation Actions for City of Palo Alto.** This chapter describes recommendations for initial VMT significance thresholds to be applied by the City of Palo Alto as of July 1, 2020. These recommendations are generally consistent with State guidance. Following the ongoing Sustainability and Climate Action Plan (S/CAP) Update, the City of Palo Alto will have the opportunity to review and adjust the CEQA VMT thresholds to align with the City’s S/CAP goals or policies.

At the end or within Chapters 3 through 6, the decision options, limitations and considerations are summarized, which matches the decisions matrix (**Appendix A**). Also included in these summaries are two draft threshold recommendations for Near-Term and Far-Term SB 743 implementation in Palo Alto:

- **Option 1 Near-Term:** Rely on the OPR Technical Advisory thresholds
- **Option 2 Far-Term:** Set thresholds consistent with the 2020 S/CAP or Comprehensive Plan future year VMT projections
Chapter 2. Background

Use of CEQA Prior to SB 743

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

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

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

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

Overview of Senate Bill 743 and Legal Framework

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

- **New methodologies** under the California Environmental Quality Act are **needed for evaluating transportation impacts** that are better able to promote the state’s goals of reducing greenhouse gas emissions and traffic-related air pollution, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations.

- More appropriately **balance the needs of congestion management with** statewide goals related to **infill development**, promotion of public health through **active transportation**, and **reduction of greenhouse gas emissions**.

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

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

Following several years of draft proposals and related public comments, OPR settled upon VMT as the preferred metric for assessing passenger vehicle-related impacts and issued revised CEQA Guidelines in December 2018, along with a Technical Advisory On Evaluating Transportation Impacts in CEQA (December 2018; referred to in this document as the Technical Advisory) to assist practitioners in implementing the CEQA Guidelines revisions. Under the revised CEQA Guidelines, vehicle level of service (LOS)\(^6\) is no longer to be used as a determinant of significant environmental impacts, and analysis of a project’s impacts will now be based on assessment of VMT. Lead agencies have until July 2020 to

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\(^6\) LOS refers to “Level of Service,” a metric that assigns a letter grade to network performance. The typical application in towns and cities is to measure the average amount of delay experienced by vehicle drivers at an intersection during the most congested time of day and assign a report card range from LOS A (fewer than 10 seconds of delay) to LOS F (more than 80 seconds of delay). Vehicle level of service is used to measure vehicle mobility.
implement the new VMT methods, after which all transportation analysis performed under CEQA must be consistent with the revised CEQA Guidelines.

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

The CEQA Guidelines and the associated OPR Technical Advisory are largely consistent with the legislative direction noted above. Specifically, the use of VMT as a metric focuses on the total amount of driving, rather than the driving experience. This new view presents an impact filter intended to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. VMT can help identify how projects (land development and infrastructure) influence accessibility (i.e., access to places and people), noise, and emissions; thus, its selection as a metric is aligned with the objectives of SB 743.

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

State of SB 743 Implementation

As Appendix B summarizes, the California lead agencies that have adopted VMT thresholds as of approximately January 2020 are as follows:

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

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

Summary of Regional Transportation Policies

In the Bay Area, the regional Sustainable Community Strategy (SCS) is Plan Bay Area, developed and managed by the Metropolitan Transportation Commission (MTC), and updated roughly every five years. All metropolitan regions in California are required to prepare a sustainable communities strategy under Senate Bill (SB) 375; these strategies are intended to provide an integrated plan for housing, land use, and transportation that will meet the GHG reduction targets set by the California Air Resource Board. In short, Plan Bay Area serves as the bridge between statewide GHG reduction targets and local land use and transportation decisions.

Plan Bay Area includes a number of policy and land use strategies to meet these statewide goals. Generally, it focuses on supporting growth in designated Priority Development Areas (PDAs), which include many areas near transit, in dense urban or suburban centers, or that have otherwise been designated as having high potential for growth by local jurisdictions. In doing so, the plan is intended to indicate how the region can accommodate expected population growth, job growth, and transportation demands into the future. In many ways, Plan Bay Area can be seen as the “budget” for how regional growth can occur without resulting in GHG and VMT generation above what our goals aim to achieve.

Santa Clara County Congestion Management Program

The Congestion Management Agency (CMA) legislation requires establishment of a congestion management program (CMP) in urbanized counties. The legislation requires “a program to analyze the impacts of land use decisions made by local jurisdictions on regional transportation systems” and, a “uniform methodology” for analyzing level of service. VTA is the CMA and maintains the CMP for Santa Clara County.

SB 743 amends CMP law to reinstate the ability of cities and counties to designate “Infill Opportunity Zones” where the CMP LOS standard would not apply. These areas may be established in Transit Priority Areas or high-quality transit corridors with 15-minute or better service frequencies. A previous provision in CMP law allowing the establishment of Infill Opportunity Zones expired in 2009.

Outside of designated Infill Opportunity Zones, the SB 743 does not alter the use of LOS to evaluate and monitor traffic operations on the CMP roadway network. Should a project or other action from a local agency result in a CMP facility exceeding the designated LOS standard, CMP legislation requires local agencies prepare a “Deficiency plan” that improve systemwide traffic level of service and contribute to
significant improvements in air quality. Jurisdictions with CMP facilities exceeding the LOS standard and do not have Congestion Management Agency (CMA) approved deficiency plans risk losing new Proposition 111 gas tax revenues. Since 2013, VTA retitled “Deficiency Plans” as “Multimodal Improvement Plans” (MIP) which expand emphasis on multimodal networks to reduce auto travel demand on the CMP network. Traffic growth projections from the City of Palo Alto’s Comprehensive Plan 2030, was found to result in LOS exceeding CMP standards at the El Camino Real / San Antonio Road intersection. However, the City is currently participating in the City of Mountain View’s MIP which addresses this intersection and was accepted by the VTA Board of Directors in 2018.

Caltrans Guidance

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

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

Local Framework and Summary of Existing Policies

The City of Palo Alto has several planning and policy documents that outline the City’s approach to transportation, land use, environmental sustainability and inform the policy decisions necessary to implement SB 743. Chief among them is the Comprehensive Plan 2030, which, as the City’s “constitution for future development” is the coordinating policy document for two key supporting plans related to VMT policy decisions: the Sustainability and Climate Action Plan Framework (S/CAP) and the Bicycle and Pedestrian Transportation Plan.

Comprehensive Plan 2030

Adopted in 2017, the City of Palo Alto’s Comprehensive Plan 2030 goals, policies, and programs emphasize environmentally sustainable forms of transportation and land use planning. The Comprehensive Plan’s Transportation Element includes three policy topic areas and corresponding goals associated with VMT: Sustainable Transportation, Traffic Delay and Congestion, and Streets. The following highlights goals, polices, and programs within each of these topic areas related to VMT and SB 743 implementation.
Sustainable Transportation

- Goal T-1: Create a sustainable transportation system, complimented by a mix of land uses, that emphasizes walking, bicycling, use of public transportation and other methods to reduce greenhouse gas (GHG) emissions and the use of single occupancy motor vehicles.
- Program T1.2.3: Formalize TDM requirements by ordinance and require new developments above a certain size threshold to prepare and implement a TDM plan to meet specific performance standards. Require regular monitoring/reporting and provide for enforcement with meaningful penalties for non-compliance.
- Policy T-1.3: Reduce GHG and pollutant emissions associated with transportation by reducing VMT and per-mile emissions through increasing transit options, supporting biking and walking, and the use of zero-emission vehicle technologies to meet City and State goals for GHG reductions by 2030

Goal T-1 establishes the linkage between transportation, land use, and greenhouse gas emissions and the City’s intent to promote decisions that reduce GHG emissions. Policy T-1.3 defines VMT as a potential metric for evaluating progress toward achieving Goal T-1, and further defines 2030 City and State GHG reduction targets as key indicator of success. As discussed in the following section, the City’s Sustainability and Climate Action Plan Framework (S/CAP) includes 2030 GHG reduction targets and could be used to inform the city’s future VMT thresholds of significance. Program T1.2.3 relates to establishing a performance-based transportation demand management (TDM) program and standards for new development that is based on vehicle trip reduction targets. The trip reduction target and monitoring requirements could align with potential mitigation strategies for projects that are found to result in VMT impacts.

While the Transportation Element leads with an emphasis on reducing GHG travel related to transportation, traffic delay and congestion remains a key issue of City concern and is addressed within the Traffic Delay and Congestion topic area.

Traffic Delay and Congestion

- Goal T-2: Decrease delay, congestion and VMT with a priority on our worst intersections and our peak commute times, including school traffic.
- Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.
- Program T2.3.1: When adopting new CEQA significance thresholds for VMT compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standard for multimodal level of service (MMLOS), which includes motor vehicle LOS, at signalized intersections.

Policy T-2.3 continues the use of motor vehicle LOS as a measure of traffic congestion, driver delay, and to evaluate the effects of a project on the transportation network. Program T2.3.1 provides guidance for implementing SB 743 in parallel with LOS standards to continue evaluate the vehicle mobility effects on
projects. Notably, specific LOS standards, targets, or goals are not defined in this, nor any other section of the Comprehensive Plan.

Streets

- Goal T-3: Maintain an efficient roadway network for all users.
- Policy T-3.3 Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with pedestrians and bicyclists.

The Streets topic area concerns multimodal roadway design parameters, policies, and guidance. Policy T-3.3 mirrors the SB 743 legislative intent which seeks to balance congestion management with the need to develop multimodal transportation networks. At a local scale, minor isolated intersection vehicle capacity and operations enhancements are unlikely to lead to VMT impacts, but the City's policy closely aligns with local, and regional planning practices that support the State's transportation policy intent.

Sustainability and Climate Action Plan Framework

Adopted in 2016, the Sustainability and Climate Action Plan Framework (S/CAP) contains strategies for accelerating Palo Alto’s GHG emission reductions from 36% below 1990 levels to 80% below 1990 levels by 2030, which is 20 years ahead of the State of California target. The name of this strategy is "80x30." The S/CAP framework notes that road transportation represents 61% of Palo Alto's baseline carbon footprint and identifies the following transportation strategies to reduce GHG emissions:

- Expand Bicycle Infrastructure
- Expand Transit Options
- Grow Ridersharing services and mobility apps
- Provide Universal Transit Passes
- Implement Parking Pricing
- Develop Zero-Impact Mixed-Use Housing
- Electrify Palo Alto-Based Vehicles
- Electrify Inbound Vehicles

The two electric-vehicle based strategies were estimated to achieve approximately 45% of the emissions reductions from all eight mobility strategies. To align VMT thresholds with S/CAP targets, careful documentation and understanding of the VMT metric and vehicle fleet GHG emissions is necessary because the VMT metric used in a CAP may influence the VMT threshold metric and how clean the vehicle fleet is assumed influences how much a VMT reduction is needed. An update to the S/CAP is currently underway, and the City could consider aligning VMT thresholds with S/CAP targets.
Bicycle and Pedestrian Transportation Plan

Adopted in July 2012, the Bicycle and Pedestrian Transportation Plan (BPTP) is the City’s consolidated bicycle and pedestrian transportation policy and project planning document. The BPTP identifies two key objectives related to reducing transportation GHG emissions and promoting non-auto modes:

- Objective 1: Double the rate of bicycling for both local and total work commutes by 2020 (to 15% and 5%, respectively)
- Objective 2: Convert discretionary vehicle trips into walking and bicycling trips in order to reduce city transportation-related greenhouse gas (GHG) emissions 15% by 2020.

Santa Clara Countywide VMT Estimation Tool

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

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

The SCC VMT Estimation Tool consists of three separate modules:

- **VMT Screening** – The location of the project is used to determine if the project site is within a low VMT generating area, including low VMT generating traffic analysis zones (TAZ) or parcels and transit priority areas (TPA).

- **Project Generated VMT** – A combination of the project's location and project details is used to estimate VMT generated from the project, which is expressed as a VMT rate (i.e., VMT per population generating the VMT). This process can use the Santa Clara Valley Transportation Authority (VTA)’s parcel-level VMT data or TAZ level VMT generation rates to estimate the project's VMT.

- **VMT Reductions** – A series of VMT mitigation measures are applied to potentially reduce the project generated VMT. The project VMT is compared to the applicable VMT threshold to determine whether it falls below the threshold at the start, or whether it is reduced below the
threshold after applying additional VMT reduction measures. The VMT threshold used in this module is calculated in the VMT Screening module.

**VTA Transportation Impact Analysis Guidelines**

As a member agency of the Santa Clara County Congestion Management Program (CMP), the City of Palo Alto follows the *Santa Clara Valley Transportation Authority (VTA) Congestion Management Program Transportation Impact Analysis Guidelines* (2014) when conducting a transportation impact analysis for a land use or transportation project that affects congestion management program intersections or freeway segments. For consistency, City staff has also used these guidelines alongside city criteria for local transportation impact analysis. The VTA Guidelines are established to provide a clear and consistent technical approach for projects that could have transportation effects (adverse and beneficial) on the transportation system and services, and the resulting reports provide essential information for decision-makers and the public when evaluating individual development and transportation infrastructure projects.
Chapter 3. VMT Metrics

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

Many jurisdictions find it useful to express VMT as an efficiency metric (e.g., VMT per person or VMT per employee). This form of the metric is unrelated to the level of activity in a particular location and more about how efficiently the people at that location travel. A project that contributes to a more efficient use of the transportation system would reduce the total VMT per person as compared to a no-project scenario. One example of an efficiency metric is home-based VMT per resident, which looks at how much vehicle travel residents in one place generate, compared to a regional average.

Recommendations in OPR Technical Advisory

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

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

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

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

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

1. Total VMT (used in the OPR metric for the retail land use), as compared to partial VMT (used in the OPR metrics for office and residential land uses).
2. Project-Generated VMT (used in the OPR metrics for office and residential land uses), as compared to project’s effect on VMT (used in the OPR metric for the retail land use).
What Form of VMT Metrics Could be Used?

VMT can be expressed in a variety of forms, depending on specific objectives of the analysis. Examples of these forms include as follows:7

- **Total Project Generated VMT**: VMT including all vehicle trips, vehicle types, and trip purposes. This can be expressed as total project generated VMT or total project generated VMT per service population (residents plus employees).

- **Partial Home-Based VMT**: VMT generated by light-duty vehicles for all trips that begin or end at a residential land use. This is used in describing the VMT effects of residential land uses and is often expressed as home-based VMT per resident.

- **Partial Home-Based Work VMT**: VMT generated by light-duty vehicles only for commute trips (that is, trips that have one end at a workplace and one end at a residence). This is used in describing the VMT effects of workplaces and is often expressed as home-based work VMT per employee.

- **Total Boundary VMT**: VMT that occurs within a selected geographic boundary (e.g., city, county or region) by any type of vehicle. This captures all on-road travel occurring on a roadway network for any purpose and includes local trips as well as trips that pass through the area without stopping.

**VMT Metric Options: Total VMT and Partial VMT**

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

To the extent that SB 743 is designed to promote infill development, and there is substantial evidence that building projects in one area will have similar VMT effects to existing conditions in that area, a total VMT analysis may not be necessary, or total VMT may be estimated using simpler approaches than a unique travel demand forecasting model run (methodology options are discussed in Chapter 4). However, for projects that are large, complex, controversial, or represent a unique land use for the study area, a total VMT metric will likely be the most appropriate way to assess project effects. In addition, total VMT metrics derived from a transportation forecasting model are necessary to measure a project’s effect on VMT, or how the project changes the total VMT in a given geographic area. This Total Boundary VMT is discussed further in a later section, Project’s Effect on VMT.

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7 The definitions in this white paper describe VMT metrics that can be extracted from a trip-based travel forecasting model such as the VTA travel forecasting model. A tour-based travel forecasting model like the Metropolitan Transportation Commission’s (MTC) model estimates different VMT metrics (e.g., household generated VMT per capita, total VMT per employee, or work tour VMT per employee).
Total VMT is also useful for consistency with other EIR sections, namely greenhouse gases, air quality, and energy consumption. Each of these sections uses total VMT as an input for its analysis, although they may consider VMT on an annual rather than daily basis.

**Partial VMT** refers to the use of only particular trip purposes and/or vehicle types for assessing a project’s impacts. The efficiency metrics recommended by OPR for use in analyzing office and residential projects are partial VMT metrics, because they include only light-duty passenger vehicles and only trips for a specific purpose or made by a specific population. The benefits of these partial VMT metrics include the following: they allow for sketch-level analysis using findings from a prior model run; they are easier to understand and visualize; and for single land uses that are similar to existing development patterns, they are likely reflective of the same impact patterns as would be present with analysis of total VMT.

Understanding where built environment conditions lead to VMT-efficient residential and workplace activity is substantial evidence that could help support conclusions that adding similar land uses to those areas would create similar outcomes. This can be considered analogous to collecting vehicle counts at a nearby existing project and developing custom local rates. For projects that may be subject to further scrutiny, only reporting a portion of VMT from select trip purposes and limiting the VMT to light-duty vehicles could be considered an incomplete analysis of VMT.

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

**VMT Metric Options: Project-Generated VMT and Project’s Effect on VMT**

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

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

The project-generated VMT and project’s effect on VMT (using boundary VMT) accounting methods are presented in Figure 1 as a generic representation of the VMT metrics. Figure 2 shows the same metrics using.

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8 An often-cited example of how a project can affect VMT is the addition of a grocery store in a food desert. Residents of a neighborhood without a grocery store have to travel a great distance to an existing grocery store. Adding the grocery store to that neighborhood will shorten many of the grocery shopping trips and reduce the VMT to/from the neighborhood.
based on the City of Cupertino city limits and street system. Both of these metrics are needed for a comprehensive view of a project’s VMT effects. As discussed in the OPR Technical Advisory, "... new retail development redistributes shopping trips rather than creating new trips," estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project’s transportation impact.”

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Measuring Vehicle Miles Traveled (VMT)

**Project Generated VMT**

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

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

**Project Effect on VMT**

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

Notes: Boundary VMT is all the VMT on the streets within the Project Limits / Jurisdiction Limits.

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Figure 1
Measuring Vehicle Miles Traveled (VMT)
Measuring Vehicle Miles Traveled (VMT) in Palo Alto with City Streets and City Limits

Notes: External to External (XX) trips are excluded from this VMT metric. Adjustments to project generated VMT made to include the full length of trips that leave the Palo Alto to capture inter-city travel.

Notes: Boundary VMT is all the VMT within the Palo Alto (city limits).

Figure 2
Project-generated VMT is calculated by summing the “VMT from” and “VMT to” the project site (or a larger area when the project is a plan such as a Specific Plan or General Plan). These calculations are usually performed using outputs from a travel forecasting model. Most travel forecasting models will output information on the project generated VMT associated with the land use in a given transportation analysis zone (TAZ); that total is typically as follows:

\[ \text{Project Generated VMT} = \text{VMT From} + \text{VMT To} = (II + IX) + (II + XI) = 2 \times II + IX + XI \]

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

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

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

Project’s effect on VMT is estimated within a selected geographic boundary (e.g., city, county, or region) and captures all VMT on the roadway network, including both local trips and longer-distance travel that

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10 Many jurisdictions find it useful to express VMT as an efficiency metric (e.g., VMT per person or VMT per employee). This form of the metric is unrelated to the level of activity in a particular location and more about how efficiently the people at that location travel. A project that contributes to a more efficient use of the transportation system would reduce the total VMT per person as compared to a no-project scenario. A commonly used efficiency metric is “total VMT per service population,” in which the denominator called “service population” includes all of the variables that generate vehicle trips in the travel forecasting models that estimate VMT; in most instances this will include residents plus employees, and may also include other categories of people such as visitors or students if those categories are used in the trip generation estimates in the travel forecasting model.
does not have an origin or destination within the area. It is often referred to as boundary VMT. It is a more complete evaluation of the potential effects of the project because it captures the combined effect of new VMT, shifting of existing VMT to/from other neighborhoods, and/or shifts in existing VMT to alternate travel routes or modes. The absolute change in VMT between a without project and with project condition can be compared directly if the land use totals are equal between scenarios. If the land use totals are different, the VMT should be divided by the service population (typically residents plus employees but may include other VMT generators like students and visitors) to distinguish the effects of population and/or employment growth from the effects of changes in personal travel behavior.

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

**VMT Metrics for Other Resource Areas**

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

- **Project generated VMT**: Total project generated VMT with adjustments for trips that travel outside the model area and disaggregated by speed bin.\(^{11}\) (This VMT metric may vary based on a local jurisdictions Comprehensive Plan, Climate Action Plan, and regional air district requirements.)
- **Project’s effect on VMT within a select geography**: Boundary VMT on all roadways within a geographic area disaggregated by speed bin.

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

**Summary of VMT Metric Options**

The following summary table (Table 1) clarifies the VMT metric, definition, VMT accounting specification, and potential use as an input for other CEQA sections, including greenhouse gases, air quality, and energy consumption impact analysis. With the exception of Total Project Generated VMT per service population, each VMT metric listed in this table are described in the Technical Advisory: On Evaluating Transportation

\(^{11}\) Total VMT by speed bin is the VMT on the roadway for a given speed range (typically a five-mile-an-hour increment of speed from 0 to ~80 miles per hour). Emissions rates of criteria pollutants and greenhouse gases, and energy consumption vary based on vehicle speed. Thus, segmenting VMT by speed bin provides a more precise estimate of these emissions.
Impacts in CEQA (December 2018); see pages 5, 6 and 23, and Appendix 1 of the Technical Advisory. It is suggested that each of these VMT metrics be included so that all forms of VMT needed for screening and complete analysis are available (including boundary VMT by speed bin for air quality, GHG, and energy impact analysis).

Table 1: Summary of Common VMT Metrics

<table>
<thead>
<tr>
<th>VMT Metric1</th>
<th>Definition</th>
<th>Location of VMT Accounting Specification in this White Paper</th>
<th>Recommended by OPR</th>
<th>VMT used for other CEQA Sections?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Project Generated VMT</strong></td>
<td>Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, presented as a total project generated VMT.</td>
<td>Project Generated VMT Accounting on page 17</td>
<td>Yes, for land use plans, and discussed in Appendix 1 of the OPR Technical Advisory.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Total Project Generated VMT per Service Population2 3 (aka Total Project Generated VMT Rate)</strong></td>
<td>Daily VMT of all vehicle trips, vehicle types, and trip purposes for all project land uses, divided by the sum of residents plus employees.</td>
<td>Project Generated VMT Accounting on page 16 using Total VMT per Service Population.</td>
<td>No, although may be helpful for mixed-use projects and comparing land use scenarios, particularly when using a travel forecasting model.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Partial Home-Based VMT per Resident4 (aka Home-Based VMT Rate)</strong></td>
<td>VMT generated by light-duty vehicles for all trips that begin or end at a residential land use, divided by residents.</td>
<td>Project Generated VMT Accounting on page 17 using Home-Based VMT per Resident.</td>
<td>Yes, for residential projects on page 5 and Appendix 1 of OPR Technical Advisory.</td>
<td>No</td>
</tr>
<tr>
<td><strong>Partial Home-Based Work VMT per Employee4 (aka Home-Based Work VMT Rate)</strong></td>
<td>VMT by light-duty vehicles only for work trips (that is, trips that have one end at a workplace and one end at a residence), divided by number of employees.</td>
<td>Project Generated VMT Accounting on page 16 using Home-Based Work VMT per Employee.</td>
<td>Yes, for office projects on page 6 and Appendix 1 of OPR Technical Advisory.</td>
<td>No</td>
</tr>
</tbody>
</table>
### Table 1: Summary of Common VMT Metrics

<table>
<thead>
<tr>
<th>VMT Metric</th>
<th>Definition</th>
<th>Location of VMT Accounting Specification in this White Paper</th>
<th>Recommended by OPR</th>
<th>VMT used for other CEQA Sections?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project’s Effect on VMT within the Boundary of a Specific Area (aka Boundary VMT; Total VMT)</strong></td>
<td>VMT that occurs within a selected geographic boundary (e.g., City, County, or region) by any type of vehicle. This captures all on-road vehicle travel on a roadway network for any purpose, and includes local trips as well as trips that pass through the area without stopping.</td>
<td>Boundary VMT on page 21</td>
<td>Yes, for retail projects and transportation projects on pages 5, 6 and 23 and Appendix 1 of the OPR Technical Advisory.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes:**
1. Each VMT metric is an option for baseline and/or cumulative impact analysis.
2. Total project generated VMT is derived from this VMT rate.
3. The project generated VMT accounting is similar to an origin-destination accounting used for many Climate Action Plans.
4. A partial VMT estimate.

OPTIONS, LIMITATIONS, AND CONSIDERATIONS: VMT METRICS

COMMON OPTIONS

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

COMMON LIMITATIONS

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

CONSIDERATIONS

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

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

OPTION 1 NEAR-TERM: RELY ON THE OPR TECHNICAL ADVISORY THRESHOLDS

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

- Total Project Generated VMT
- Total Project Generated VMT per Service Population
- Home-Based VMT per Resident
- Home-Based work VMT per Employee
- Boundary VMT for an appropriate area affected by the Project (needed for air quality, GHG, and energy analysis)

OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020 S/CAP OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS

Include the following so that forms of VMT needed for a complete VMT analysis are available:

- Total Project Generated VMT
- Total Project Generated VMT per Service Population
- Boundary VMT for an appropriate area affected by the Project (needed for air quality, GHG, and energy analysis)
Chapter 4. VMT Calculation Methods

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

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

- **Travel Forecasting Models:** A travel forecasting model is a computer model used to estimate travel behavior for a specific horizon year based on land use and transportation network supply inputs. VMT is one output of a travel forecasting model run. The Caltrans Statewide Travel Forecasting Model, Metropolitan Transportation Commission (MTC) Regional Travel Forecasting Model, and Santa Clara County/San Mateo County (VTA-C/CAG) Bi-County Travel Forecasting Model are all examples of travel forecasting models.

- **Non-Model “Accounting Methods:”** In some cases where a travel model is not available or not appropriate, VMT can be estimated using sketch models or spreadsheet tools. VMT can also be estimated directly by multiplying the number of trips by an average trip length. Trips can be estimated using the results of local trip generation surveys or trip generation rate data published by the Institute of Transportation Engineers (ITE). Trip lengths can be extracted from models or from standardized averages or travel pattern data from the regional or sub-regional planning organization. Using trip length averages does not consider changes to the roadway network or traffic congestion, or the project’s potential effects on overall travel patterns. These non-model “accounting methods” could also be paired with a travel model and used between major model updates or to estimate project generated VMT for small projects that would “get lost” in a model. The forthcoming Santa Clara Countywide VMT Estimation Tool is an example of a VMT screening tool that uses outputs from a travel forecasting model and conducts off-model VMT reduction calculations to test potential transportation demand management strategies to reduce VMT.

Model Selection for Calculating VMT

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

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

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

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

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

The VTA travel forecasting model includes a more detailed representation of the transportation network and land use patterns in Santa Clara County, and is the model that has traditionally been used for most project-specific applications in Santa Clara County. A comparison of available travel forecasting models is shown in Appendix C.

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

A travel forecasting model should have a base year and a future year, which are needed to evaluate project and cumulative impacts. As noted above, lead agencies have discretion to choose their analysis methods. However, if they prefer to establish thresholds that rely on regional averages of baseline VMT, then the travel forecasting model must cover a large enough area. The OPR Technical Advisory cites the importance of not truncating trip lengths based on travel forecasting model or political boundaries:
**Considerations for All Projects.** Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a “good faith effort at full disclosure.” (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project’s short-term and long-term effects on VMT. (Quote from page 6 of the *Technical Advisory: On Evaluating Transportation Impacts in CEQA*, December 2018).

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

In addition to concerns around truncating trips, most models cannot analyze transportation effects at the parcel or project level because the most disaggregate level of land use in a travel model is the transportation analysis zone.12 These TAZ boundaries are not artificial and substantial effort is usually applied when designing a TAZ system. While a project may be one or several parcels, the finest level a VMT analysis should be conducted on (absent supporting substantial evidence of statistical validity) is the TAZ. As such, it does present a limitation for analysis of smaller areas at the sub-TAZ level. The response to this type of limitation is to modify the model to add detail and split TAZs.

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

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

Lead agencies should be aware that regional models ‘off the shelf’ are often not sufficiently accurate or sensitive to local-scale applications such as individual land use project analysis. Calibration and validation of the model within the project study area are typically needed, including refinements and modifications to better represent the project and its effects.

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12 As defined by *NCHRP Report 716, Travel Demand Forecasting: Parameters and Techniques*, TRB, 2012, “TAZ boundaries are usually major roadways, jurisdictional borders, and geographic boundaries and are defined by homogeneous land uses to the extent possible.”
The OPR Technical Advisory states that sketch-level models may be used for project VMT analysis if the trip lengths are replaced with those from the local or regional model that was used to establish the lead agency’s VMT thresholds. To be fully consistent, the trip generation estimates of the sketch model would also have to be replaced. Unfortunately, most travel forecasting models do not use typical project land uses as trip generation inputs, making this substitution difficult.

Non-Model Spreadsheets and Sketch Planning Tools

Sketch planning tools are generally designed for project-scale applications to estimate VMT or to evaluate VMT reduction strategies associated with transportation demand management (TDM). Given their project-scale focus, a major limitation for all these tools is that they are not capable of producing region-wide or city-wide average VMT metrics for purposes of threshold setting. In addition, they may not be able to account for land use that is substantially different from existing land uses.

The OPR Technical Advisory on Evaluating Transportation Impacts in CEQA contains the following specification for models and methods (page 5 of OPR Technical Advisory).

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

If travel forecast model outputs from the VTA-C/CAG Bi-County travel forecasting model (“VTA travel model”) are used to identify the VMT baseline value that sets the threshold for significance determination, then the VTA travel model (or its inputs/outputs) would need to be used for project analysis to determine project generated VMT. As a result, current sketch tools “off-the-shelf” would not be appropriate to estimate project generated VMT for SB 743 purposes. The sketch models would require modification, such as using VMT generation rate outputs from the local or regional travel forecasting model used to set thresholds. A potential off-the-shelf application for some of these tools is to test VMT reduction strategies. Even for this type of application, care must be taken by the analyst to understand what VMT reduction strategies may have already been captured in the VTA travel model to avoid double counting.

This review evaluated eleven sketch model tools using the following criteria. We also incorporated information from reviews conducted through academic research by UC Davis and UC Berkeley.

1. **Defensibility** – How defensible is the use of this tool in terms of the accuracy of its outputs and frequency of use by other agencies.
2. **Sensitivity** – How sensitive is to the tool to the specific land use contexts and TDM strategies (e.g., does the tool allow the user to import details related to the context surrounding the project site and the proposed TDM mitigation measures).

3. **Utility** – How easy is the tool to use to evaluate VMT and TDM strategies.

The eleven sketch model tools reviewed are listed below.

- **CalEEMod** – is a statewide computer model designed to estimate emissions of criteria air pollutant and greenhouse gas (GHG) associated with land use projects. This model also provides VMT estimates that are a part of the emissions modeling process.\(^\text{13}\)
- **Sketch 7** – is a spreadsheet tool that estimates percent reductions to VMT based on the 7 Ds (i.e., density, diversity, distance, design, destination, demographics, and development scale).
- **VMT Impact Tool/Salon** – is a spreadsheet tool created by Deborah Salon at UC Davis for the California Air Resources Board that quantifies how much VMT will change in response to changes in land use and transportation system variables at a policy level.
- **GreenTRIP Connect** – is an online tool for residential projects that allows users to evaluate the VMT and GHG emissions of their project and to test a limited set of built-in TDM strategies.
- **MXD/MXD+** – is a mixed-use development trip generation tool developed for U.S. EPA that adjusts ITE daily trip generation estimates to reflect built environment effects. MXD+ incorporates the ITE mixed-use trip generation method to produce a.m. and p.m. peak hour trip generation estimates for mixed use projects. To estimate VMT, the trip generation results from MXD/MXD+ must be multiplied by trip lengths from observed data or regional/local travel forecasting models.
- **UrbanFootprint (UF)** – is a scenario planning tool that produces VMT estimates relying on the MXD trip generation methodology. Trip lengths are calculated within the model but do not reflect network-based routing.
- **Envision Tomorrow** – is a scenario planning tool that produces VMT estimates.
- **California Smart-Growth Trip Generation Adjustment Tool** – is a spreadsheet tool that provides the number of trips generated by land use projects implementing smart growth principles.
- **TRIMMS** – is a visual basic application spreadsheet model that estimates mode share and VMT changes brought about by a number of TDM strategies.
- **VMT+** – is a web-based application that estimates VMT and emissions using ITE trip rates and user-defined trip and land use inputs.
- **TDM+** – is a spreadsheet tool that estimates the percent reduction in VMT due to the implementation of one or many different TDM strategies identified in the *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, 2010.

\(^{13}\) CalEEMod uses ITE trip generation rates, but does not currently have a license to use ITE trip generation rates, which could affect the usefulness of this sketch tool.
Table 2 provides a summary of the tool review. Each of the sketch models reviewed, except for the CA Smart Growth Tool and MXD/MXD+, provide direct estimates of project generated VMT or calculates the percent change in VMT. None of the models are capable of producing city-wide or region-wide VMT estimates for threshold setting, fully evaluating the project’s effect on VMT, or evaluating cumulative VMT impacts. Only CalEEMod, GreenTRIP Connect, TRIMMS, and TDM+ evaluate the impacts of TDM strategies for VMT mitigation.

In addition to the tools shown in Table 2, VTA is currently in the process of developing a web application that will screen and estimate project generated VMT and VMT reductions for land use projects in Santa Clara County. The types of land use projects would include residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without ancillary retail space. The Santa Clara Countywide VMT Evaluation Tool will be modular, such that VTA, along with the cities and towns in Santa Clara County can include their specific VMT screening requirements or VMT data within the Santa Clara Countywide VMT Evaluation Tool. The web application will be scalable such that it can be used for a range of project sizes and locations within any jurisdiction in Santa Clara County. This web application will include the partial home-based VMT per resident and partial home-based work VMT per employee, and has the potential to include total VMT per service population, boundary VMT, and a project’s effect on VMT screening.
<table>
<thead>
<tr>
<th>Sketch Tool</th>
<th>Output</th>
<th>Technical &amp; Legal Defensibility</th>
<th>Parameter Sensitivity</th>
<th>Administrative Utility</th>
<th>Comments</th>
<th>User Experience: Benefits (UC Davis3)</th>
<th>User Experience: Drawbacks (UC Davis3)</th>
<th>Conclusions (UC Berkeley4)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CalEEMod</td>
<td>VMT</td>
<td>Widespread use, used by SCAQMD</td>
<td>++</td>
<td>++</td>
<td>Trinity Consultants product, may not be able to make changes. CalEEMod uses ITE trip generation rates, but does not currently have a license to use ITE trip generation rates.</td>
<td>Many, customizable inputs; program interface reduces back-end error</td>
<td>Many, customizable inputs; defaults and land use categories may misrepresent project and/or context area</td>
<td>Easier data demands; difficult to determine location attributes, especially to avoid double counting; documentation did not provide enough guidance on method selection</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Sketch 7</td>
<td>% Change in VMT</td>
<td>HH VMT</td>
<td>+</td>
<td>No internalization, no TDM reduction, no trip purpose</td>
<td>Straightforward inputs &amp; interface; system-level outputs; outputs include walk, bike, and transit trips</td>
<td>Spreadsheet interface can become ’buggy’, break; regional TAZ data used to calibrate tool may be difficult to obtain</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>VMT Impact Tool/Salon</td>
<td>% Change in VMT</td>
<td>HH VMT</td>
<td>+</td>
<td>No internalization, no TDM reduction, no trip purpose</td>
<td>Scenario testing for census tract level &amp; above; not project-level</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>GreenTRIP Connect</td>
<td>% Change in VMT</td>
<td>Recent</td>
<td>+</td>
<td>Affordable housing, TDM credit for 4 strategies</td>
<td>Would need to work with TransForm</td>
<td>Simple user interface; straightforward outputs</td>
<td>Measures only residential travel, even in mixed-use projects</td>
<td>Candidate for TDM impacts; great interface, would need to integrate more land uses and strategies; rural results may not be valid</td>
<td>Not recommended</td>
</tr>
<tr>
<td>UrbanFootprint</td>
<td>VMT</td>
<td>Used by SCAG for RTP/SCS</td>
<td>+++</td>
<td>Many parameters, no TDM reduction, mixed-used is not by land use</td>
<td>Primarily scenario planning; need to check with Calthorpe re editing open source code</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Envision Tomorrow</td>
<td>VMT</td>
<td>Added parameters of diluted research</td>
<td>+++</td>
<td>Many parameters, no TDM reduction</td>
<td>Primarily scenario planning; owned by Fregonese</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>CA Smart Growth Tool</td>
<td>Trips</td>
<td>No trip purpose, no TDM reduction</td>
<td>++</td>
<td>Many parameters, no TDM reduction</td>
<td>Few, intuitive inputs with direction of where to find them</td>
<td>Calculates trips one land use at a time, and in limited context areas; calculates trips, not VMT</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>TRIMMS</td>
<td>VMT</td>
<td>Used by SKCOS</td>
<td>++</td>
<td>TDM reduction</td>
<td>Has a few elements that do not exist in CAPCOAs; integrate into another tool?</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>MVD+</td>
<td>Trips; VMT</td>
<td>++</td>
<td>Many parameters, no TDM reduction</td>
<td>Simple inputs categories; straightforward outputs</td>
<td>Important input data may be difficult to find</td>
<td>High data input demands; obtaining data required GIS capability3</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
</tr>
<tr>
<td>VMT+</td>
<td>VMT</td>
<td>Surpassed by MVD+</td>
<td>+</td>
<td>Limited parameters</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Not recommended</td>
<td></td>
</tr>
<tr>
<td>TDM+</td>
<td>% Change in VMT</td>
<td>++</td>
<td>CAPCOA-based</td>
<td>May want to add more TDM measures</td>
<td>Only does TDM reductions; needs to be coupled with VMT estimator</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>[Not reviewed]</td>
<td>Best option for TDM impacts, no rural option</td>
</tr>
</tbody>
</table>


Notes: 1Amy Lee, Kevin Fang, and Susan Handy; “Evaluation of Sketch-Level Vehicle Miles Traveled (VMT) Quantification Tools,” National Center for Sustainable Transportation, August 2017.
3Analysis based on earlier, public spreadsheet tool; more advanced proprietary versions available.
OPTIONS, LIMITATIONS, AND CONSIDERATIONS: VMT CALCULATION METHODS

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

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

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

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

OPTION 1 NEAR-TERM: RELY ON THE OPR TECHNICAL ADVISORY THRESHOLDS
Use the Santa Clara Countywide VMT Evaluation Tool for baseline VMT screening. And most likely the VTA-C/CAG Bi-County Travel Forecasting Model, Local City of Palo Alto Travel Forecasting Model, or Non-model “Accounting Methods” such as sketch planning tool or spreadsheet for more complete VMT analysis.

OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020 S/CAP OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS
Most likely the VTA-C/CAG Bi-County Travel Forecasting Model, or the Local City of Palo Alto Travel Forecasting Model.
Chapter 5. VMT Impact Significance Thresholds

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

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

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

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

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

1) **Use Screening Criteria.**

The concept of project screening is that some projects have characteristics that readily lead to the conclusion that they would not cause a VMT impact, and therefore could be screened out of doing a detailed VMT analysis. The CEQA Guidelines state that projects within ½ mile of a major
transit stop or a stop along a high-quality transit corridor (i.e., with at least 15-minute headways during peak hours) should be presumed to have no impact on VMT.

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

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

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

The OPR Technical Advisory contains suggested VMT thresholds. The basic suggested threshold is that each project achieves a VMT level that is at least 15% below baseline conditions. In the case of the City of Palo Alto, the “region” would be the nine-county Bay Area.

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

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

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

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

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

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

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

Another option for setting a local threshold is to consider what level of VMT reduction is feasible to achieve in the local context. Analysis tools are available to estimate the amount of VMT reduction that can be achieved from different types of mitigation strategies deployed in different settings. Applying these tools to the range of settings that exists in a jurisdiction would yield an estimate of the amount of VMT mitigation that could feasibly be achieved, and that figure could then be incorporated into a VMT threshold. Setting a threshold based on the feasibility of mitigation may not be fully supported by past CEQA practices.

The City of Palo Alto is currently updating the Sustainability and Climate Action Plan (S/CAP) adopted in 2016. The 2016 Plan includes a goal of reducing greenhouse gas emissions 80 percent below 1990 levels by 2030 (i.e., 80 x 30 goal). The purpose of the 2020 S/CAP is to determine the Goals and Key Actions needed to meet the community’s sustainability goals, including the goal of
reducing greenhouse gas (GHG) emissions. The outcome of the 2020 S/CAP update process is the best framework for developing a jurisdiction specific VMT threshold based on Palo Alto GHG reduction goals and strategies. The City of Palo Alto may decide on a revised set of VMT thresholds based on the outcome of the 2020 S/CAP process.

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

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

**Context for Setting VMT Impact Thresholds**

California law\(^\text{14}\) states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses.

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

On the other hand, if VMT is treated more like LOS, then lead agencies would have a similar level of discretion to establish thresholds based on context (i.e., sensitivity to the amount of vehicle travel). Past practice allowed lead agencies to set LOS thresholds based largely on the local community’s sensitivity to travel delay. This is consistent with CEQA Guidelines Section 15064: “...An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.” Rural areas that were more sensitive were allowed to establish LOS thresholds that equated to lower levels of delay.

\(^{14}\) Section 21099 of California Public Resources Code codifies the required changes to the guidelines implementing CEQA as mandated in Senate Bill 743. Section 21099 includes a requirement that the criteria for determining the significance of transportation impacts must “promote the reduction of greenhouse emissions, the development of multimodal transportation networks, and a diversity of land uses.”
Using this analogy, a lead agency could set VMT thresholds based on a community’s sensitivity to the amount of vehicle travel or its associated effects.

Is the use of VMT Impact Screening Desired?

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

Projects Located Near Frequent and High Capacity Transit

CEQA Guidelines § 15064.3(b) explicitly states that projects within ½ mile of a high-quality transit corridor or major transit station should be presumed to have no impact on VMT. A major transit station is a rail or ferry terminal, or a location where two high-frequency bus lines intersect. A major transit corridor is defined as a corridor with high-frequency bus service in the peak hour. The City of Palo Alto has some discretion whether to define these areas as ½-mile walksheds or ‘as the crow flies.’ Applying a ½ mile walkshed method would be consistent with the concept of screening land uses on parcels that have good access to transit and is a more conservative and defensible approach.

Projects Located in Low-VMT Generating Area

In addition, the OPR Technical Advisory presents a method for “map-based” screening, where projects located in low-VMT areas may require only a qualitative discussion provided they comply with planning best practices for infill development. A low VMT area is generally defined as one where the VMT per capita under existing conditions (based on a model run) is below the impact threshold adopted by the lead agency. The rationale behind screening based on location in a low-VMT area is that future residents, employees, and visitors are likely to have similar travel patterns to current populations in the study area. Therefore, if a project includes elements that are substantially different from existing development patterns, additional analysis may be necessary even if the area has a low level of VMT generation under existing conditions.

Local-Serving Retail Projects

Local-serving retail is unlikely to have a substantial influence on local VMT. Smaller retail uses such as grocery stores, dry cleaners, pharmacies, and convenience stores tend to attract visitors from nearby neighborhoods. As an example, consider the effect of a new grocery store in an area without one. Residents of a neighborhood without a grocery store have to travel a great distance to an existing grocery store. Adding the grocery store to that neighborhood will shorten many of the existing grocery shopping trips and reduce the VMT to/from the neighborhood, while it is unlikely to attract visitors who are already
near an existing grocery store. The OPR *Technical Advisory* indicates that screening for local-serving retail may be applied for uses up to 50,000 square feet.

**Specific Transportation Projects**

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

**Projects with No Net VMT Increase**

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

**Affordable Housing Projects**

The OPR *Technical Advisory* (pages 14-15) indicates that 100 percent affordable housing projects in infill locations may be screened from further analysis based on evidence that affordable housing both generates less VMT per capita than market-rate housing, and may help improve jobs-housing balance. The City of Palo Alto may apply its own screening criteria for residential projects (or residential portions of mixed-use projects) containing a particular amount of affordable housing based on evidence such as project location (i.e., proximity to jobs, shopping, services, and schools), project characteristics (i.e., parking supply), project trip reduction measures, access to transit and active transportation facilities, etc.

**Small Projects**

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

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15 Refer to technical memorandum on small project triggers in Appendix E.
OPTIONS, LIMITATIONS, AND CONSIDERATIONS: SCREENING

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

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

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

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

OPTION 1 NEAR-TERM: RELY ON THE OPR TECHNICAL ADVISORY THRESHOLDS
Rely on screening if consistent with applicable comprehensive plan and supported by substantial evidence demonstrating cumulative VMT is declining. For project-by-project VMT analysis with VMT screening, most projects will likely not screen out, which will require a more complete VMT analysis.

Apply screening for the following project types:
- Small Developments
- Projects in Low-VMT Areas
- Projects in Proximity to Major Transit Stops
- Affordable Housing
- Local-Serving Retail Projects less than 10,000 square feet
- Transportation Projects that do not add vehicle capacity

The Santa Clara Countywide VMT Estimation Tool will be applied for screening as follows:
- Low VMT generation map-based screening of residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without local serving retail space.
- A transit priority areas (TPAs)/major transit stops and high-quality transit corridor (HQTc) screen.

OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020 S/CAP OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS
Screening VMT is not used for this approach.
What is the VMT Impact Significance Threshold for Land Use Projects and Land Use Plans Under Baseline Conditions?

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

- **Residential projects:** A proposed project exceeding a level of 15% below existing (baseline) VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita, a citywide VMT per capita, or as geographic sub-area VMT per capita.

- **Office projects:** A proposed project exceeding a level of 15% below existing (baseline) regional VMT per employee may indicate a significant transportation impact.

- **Retail projects:** A net increase in total (boundary) VMT may indicate a significant transportation impact.

- **Mixed-use projects:** Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project’s dominant use. In the analysis of each use, a project should take credit for internal capture.

- **Other non-residential project types:** OPR recommends using the quantified thresholds above, thus a proposed project exceeding a level of 15% below existing regional VMT per employee for the proposed non-residential project type or resulting in a net increase in total (boundary) VMT may be considered significant. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types.

- **Redevelopment projects:** Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As shown above, OPR does not make consistent recommendations for employment land use projects. In some cases, OPR recommends a 15% reduction in per capita VMT, in some cases no increase in boundary VMT, and in some cases OPR leaves threshold selection to jurisdiction discretion.

The OPR Technical Advisory suggests that a VMT per capita of 15% below existing development may be an appropriate threshold for a significant impact. The 15% reductions specified in the Technical Advisory are based on light-duty vehicle project generated VMT (i.e., passenger cars and light trucks). This presumption was included in the CARB modeling of MPO regional transportation plan/sustainable communities strategies (RTP/SCSs). The CARB Scoping Plan and Mobile Source Strategy identifies that a 14.3% reduction in total VMT per capita or a 16.8% reduction in light-duty vehicle VMT per capita from 2018 baseline levels is necessary to meet state GHG reduction goals by 2050. These reduction values are
based on a fair share estimate of new development’s responsibility for VMT reduction and presume that all California residents in the year 2050 will be performing at the reduced VMT levels. If existing residents (meaning those present in 2018) do not change their travel behavior and the full reduction in VMT had to be allocated only to new growth, then the reduction goal for new developments would be much higher. Further, if VMT per capita trends continue to increase as noted in the 2018 Progress Report California’s Sustainable Communities and Climate Protection Act, California Air Resources Board, November 2018, then these reduction percentage values will have to increase. This number is discussed further in Appendix D.

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

It should be noted that the recommendation above for mixed-use projects to focus the VMT analysis on the “dominant use” may present new challenges. The term “dominant use” is not defined in the CEQA statute or CEQA Guidelines. As such, there are many ways to define it, which could simply create more legal arguments for challenging projects.

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

The VTA used its travel model to prepare baseline (2015) and cumulative (2040) VMT estimates for the home-based VMT per resident and home-based work VMT per employee (see Appendix F).

**Set a Threshold Based on State Goals**

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

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

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

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

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

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

Another factor for consideration is whether the project is consistent with the applicable RTP/SCS. Although OPR recommends that such consistency not be the sole basis for impact analysis (p. 22), it can be considered in conjunction with other factors especially whether a project would jeopardize the RTP’s

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

17 Caltrans is developing a threshold recommendation for land use projects for intergovernmental review (IGR) purposes. Local jurisdictions should consider whether a Caltrans or (CARB) threshold constitutes a state threshold that must be applied in addition to their local threshold preference similar to past practices for LOS impact analysis of the state highway system.
air quality conformity, which is tied directly to VMT. These recommendations raise key questions for lead agencies, as addressed in the next section.

Set a Threshold Consistent with an Existing Comprehensive Plan

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

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

The main limitation of this approach is if a jurisdiction’s adopted Plan was developed prior to State of California approval of a variety of new laws related to climate change and GHG reduction. As such, the Comprehensive Plan may not be consistent with State expectations for emissions and VMT reductions and all the other local community objectives. The update of Palo Alto’s Comprehensive Plan was adopted in November 2017 and includes updated land use and transportation policies supportive of state goals to reduce GHG emissions, active transportation, and in-fill development. The forthcoming S/CAP update will inform of the most current VMT trends and possibly lead to an update of the city’s VMT thresholds consistent with the Comprehensive Plan future year VMT projections.

Additional Considerations for Land Use Plans

Rather than analyzing VMT for each proposed land use project individually, a jurisdiction may choose to complete VMT impact analysis as part of its Comprehensive Plan EIR and make specific use of CEQA Guidelines Section 15183 (See Appendix D for additional discussion). Setting a threshold for the Comprehensive Plan itself and analyzing VMT impacts in the Comprehensive Plan EIR could exempt projects consistent with the Comprehensive Plan from further VMT impact analysis. The City of Palo Alto may adopt a threshold that is based on substantial evidence\(^\text{18}\), use it in its Comprehensive Plan EIR,

\(^\text{18}\) CEQA Guidelines, § 15384 defines “substantial evidence” as:
determine if VMT impacts are significant, mitigate to the extent feasible, and adopt a statement of overriding consideration if determined to be appropriate. The lead agency can then tier off the Comprehensive Plan EIR for projects consistent with the Comprehensive Plan without doing additional VMT impact analysis. This could occur after adoption of the 2020 S/CAP.

(a) “Substantial evidence” as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency. Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.

(b) Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.
**Options, Limitations, and Considerations: Baseline VMT Thresholds**

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

**Common Limitations**

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

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

**Option 1 Near-Term: Rely on the OPR Technical Advisory thresholds**

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

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

Since VMT is already used in air quality, GHG, and energy impact analysis, lead agencies should review thresholds for those sections to help inform new thresholds exclusively for transportation purposes. Lead agencies should carefully consider how they value state goals for VMT/GHG reduction in light of other Comprehensive Plan and community objectives. Translating State of California goals into VMT thresholds should consider substantial evidence such as California Air Resources Board 2017 Scoping Plan - Identified VMT Reductions and Relationships to State Climate Goals, January 2019, CARB. Absent development of a specific VMT threshold, lead agencies may rely on those of other state agencies. The ARB thresholds are supported by substantial evidence related to state air quality and GHG goals, but do not consider recent VMT trends or the potential influence of emerging mobility options such as autonomous vehicles (AVs).

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

proposed new residential, office or retail land uses would individually exceed their respective thresholds.

**Area Plans: A comprehensive plan, area plan, or community plan may have a significant impact on transportation if the proposed new land uses would individually exceed their respective thresholds or cause the total project generated VMT per service population to exceed 15 percent below the baseline VMT per service population. Baseline total project generated VMT per service population may be measured as regional VMT per service population, a citywide VMT per service population, or as geographic sub-area VMT per service population.

**OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020S/CAP GOALS OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS**

Set baseline VMT threshold based on long-term Comprehensive Plan expectations for air quality and GHG emissions. The analysis to determine these thresholds would be completed if the City Council selects this option. Example baseline thresholds are as follows.

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

- **Land Use Plans:**
  - Project Impact: A significant impact would occur if the VMT rate for the plan area would exceed a level of X% below the applicable baseline VMT rate.
What is the VMT Impact Significance Threshold for Land Use Projects and Land Use Plans Under Cumulative Conditions?

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

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

**Retail Projects.** Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns. (Quote from page 5 of the Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018; footnote 11 in this quote is a reference to see Appendix 1 of the OPR Technical Advisory, which discusses evaluation of Total VMT – OPR is referring to boundary VMT.).

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

**Cumulative Impacts.** A project’s cumulative impacts are based on an assessment of whether the “incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.” (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) (Quote from page 6 of the Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018).
The inclusion of project’s effect for retail has raised the question about whether it would also be appropriate for other land uses. A complete analysis that considers the project’s effect on VMT is important because land use projects can influence the routing of existing trips and the VMT generation of surrounding land uses. Combined with the expectations established in the CEQA Guidelines and CEQA case law, ignoring the project’s effect on VMT may not fully disclose the potential effects on the environment.

**Cumulative VMT Threshold Options**

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

- **Fair Share of Regional VMT Allocation**: Use the VTA travel model to analyze the project’s effect on VMT based on RTP/SCS consistency (projects should not increase the total project generated regional VMT forecast used to support the RTP/SCS air quality conformity and SB 375 GHG targets).

- **Cumulative VMT Thresholds is the Same as Baseline VMT Threshold**: Use the baseline VMT threshold (used for a Project Conditions evaluation of the project) if the baseline VMT efficiency metric is trending downward under Cumulative Conditions.

- **Long-Term Air-Quality and GHG Expectations**: Establish a VMT reduction threshold for Cumulative Conditions consistent with long-term air pollution and GHG reduction expectations.

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

COMMON OPTIONS

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

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

COMMON LIMITATIONS

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

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

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

CONSIDERATIONS

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

- Land Use Projects:
  - Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.
- Land Use Plans:
  - Project Effect: A significant impact would occur if growth in the plan area increases total VMT in the study area compared to cumulative no project conditions.
- Transportation Projects: A significant impact would occur if the project cause a net increase in total regional VMT compared to cumulative no project conditions.

ALL LAND USE AND TRANSPORTATION PROJECTS: A SIGNIFICANT IMPACT WOULD OCCUR IF THE PROJECT IS INCONSISTENT WITH THE REGIONAL TRANSPORTATION PLAN/SUSTAINABLE COMMUNITY STRATEGY PLAN (PLAN BAY AREA).

OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020 S/CAP OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS

Use the same cumulative thresholds as Option 1.
What is the VMT Impact Significance Threshold for Transportation Projects Under Baseline Conditions?

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

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

Assuming VMT is used as the metric, transit (except for on-demand transit) and active transportation projects may be considered to have less than significant impact.
OPTIONS, LIMITATIONS, AND CONSIDERATIONS: BASELINE TRANSPORTATION THRESHOLDS

COMMON OPTIONS

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

COMMON LIMITATIONS

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

CONSIDERATIONS

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

OPTION 1 NEAR-TERM: RELY ON THE OPR TECHNICAL ADVISORY THRESHOLDS

BASELINE TRANSPORTATION THRESHOLD

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

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

OPTION 2 FAR-TERM: SET THRESHOLDS CONSISTENT WITH THE 2020 S/CAP OR COMPREHENSIVE PLAN FUTURE YEAR VMT PROJECTIONS

- Use the same cumulative thresholds as Option 1.
Chapter 6. VMT Mitigation Actions

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

Existing Programs

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

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

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

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

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

- **Suburban areas, such as Palo Alto, have only moderate TDM options available for non-office land uses.** Overall, CAPCOA indicates that projects in suburban areas may be able to achieve up to a 15% reduction in daily vehicle miles traveled (VMT). However, achieving this level of reduction requires that the project either meet certain land use diversity and/or densities

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19 Comprehensive Plan Program T1.2.3 requires projects in various areas of Palo Alto to achieve a 20 to 45 percent trip reduction through TDM programs. The trip reduction goal applies to peak hour trips. A common TDM strategy used to achieve this peak hour trip reduction goal involves adopting flexible schedules where employees travel outside peak commute hours. While flextime and related strategies accomplish the goal of reducing peak hour travel and congestion levels during the heaviest travel periods, they have a much smaller or negligible effect on reducing daily vehicle trips that are accounted for in daily VMT values.
or adopt parking pricing, parking supply limits, or transit expansions—all of which may have a high financial or political cost.

- **Effectiveness of VMT reduction may diminish with each additional TDM strategy implemented.** Each of the CAPCOA TDM strategies can be combined with others to increase the effectiveness of VMT mitigation; however, the interaction between the various strategies is complex and sometimes counterintuitive. Generally, with each additional measure implemented, a VMT reduction is achieved, but the incremental benefit of VMT reduction may diminish.

- **TDM program effectiveness is highly dependent on individual tenants.** For office or retail TDM programs, the level of commitment by individual tenants determines the level of success. For most projects, the tenants will be unknown at the time of environmental review, and tenants can change frequently over the life of the building; this makes it more difficult to forecast TDM reductions.

- **TDM program implementation requires ongoing monitoring.** If used as a mitigation measure, TDM programs will require ongoing monitoring for compliance. This may require additional staff time on the part of the lead agency. In addition, there are several possible ways to monitor TDM effectiveness, ranging from vehicle counts to travel surveys, and results from different monitoring methods may not be directly comparable.

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

**What VMT Reduction Mitigation Strategies are Feasible?**

The effectiveness of different TDM strategies varies widely based on local context, scale of intervention, and availability of non-automotive transportation. TDM strategies are most effective when implemented in a policy environment that encourages land use location efficiency and infrastructure investments that support transit, walking, and bicycling. Measures that more typically come to mind when considering TDM, such as building-specific subsidy and marketing programs for transit or other non-drive-alone modes, or installation of bicycle racks, tend to be less effective than community-wide strategies and investments. Furthermore, programs tied to individual projects or buildings may vary in efficacy based solely on the final building tenants. **Figure 2** presents a conceptual illustration of the relative importance of scale.
Of the 50 transportation measures presented in the CAPCOA report, 41 are applicable at building and site level (see Appendix G for more information). Building and site-based strategies are typically more easily included as mitigations for individual projects, as the project sponsor has a greater amount of control over the specific implementation and outcomes. The remaining nine CAPCOA strategies are functions of, or depend on, site location and/or actions by local and regional agencies or funders. Table 4 summarizes the strategies according to the scope of implementation and the agents who would implement them.

Table 3: Summary of Transportation Related CAPCOA Measures

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

Note: Disruptive trends, including but not limited to, transportation network companies (TNCs), autonomous vehicles (AVs), internet shopping, and microtransit may affect the future effectiveness of these strategies.
Source: Fehr & Peers, 2020
Of these strategies, we have identified 15 that would be appropriate and potentially effective in Palo Alto. The following list of strategies were identified for more detailed review based on how land use context and potential land use changes in Palo Alto could influence each strategy’s effectiveness.

**Transportation Demand Management (TDM)**

1. **Employ marketing and encouragement strategies to promote non-drive-alone travel:** This strategy encompasses the aspects of typical TDM programs that rely on providing information and incentives to individuals interested in changing their commute patterns. Examples include providing transit schedules or trip planning assistance, hosting promotional events such as a bike to work day, or leading contests or challenges for changing travel behavior. This process is usually undertaken by employers, but some jurisdictions form public agencies or private associations that can facilitate promotions between multiple different employers.

2. **Encourage telecommuting and alternative work schedules:** This strategy relies on effective internet access and speeds to individual project sites/buildings to provide the opportunity for telecommuting. The effectiveness of the strategy depends on the ultimate building tenants and this should be a factor in considering the potential VMT reduction. Based on recent experiences during the 2020 COVID-19 Shelter-in-Place order, there may be near-term increases in the number of businesses with the necessary infrastructure to allow telecommuting.

3. **Provide ride-sharing programs:** This strategy focuses on encouraging carpooling and vanpooling by project site/building tenants and has similar limitations to strategy (2) above.

4. **Require employer-based shuttle or transit service:** This strategy involves working with individual employers or building managers to offer shuttle services. For large employers with corporate campuses, this may include running private shuttles to and from neighborhoods where employees live. For smaller employers, or buildings with multiple employer tenants, it may involve a shuttle connecting to regional transit, such as a Caltrain station, funded through an organization such as a Transportation Management Association (TMA).

**Site Design**

5. **Provide pedestrian network improvements:** This strategy focuses on creating a pedestrian network within new projects and connecting to nearby destinations. Projects in Palo Alto tend to be smaller, so the emphasis of this strategy would likely be the construction of network improvements that connect the project site directly to nearby destinations. Alternatively, implementation could occur through an impact fee program or benefit/assessment district based on regional or local plans.

6. **Provide traffic calming measures and low-stress bicycle network improvements:** This strategy combines the CAPCOA research focused on traffic calming with new research on providing a low-stress bicycle network. Traffic calming creates networks with low vehicle speeds and volumes that are more conducive to walking and bicycling. Building a low-stress bicycle network produces a similar outcome. Implementation options are similar to strategy (5) above. One potential change in this strategy over time is that e-bikes (and e-scooters)
could extend the effective range of travel on the bicycle network, which could enhance the effectiveness of this strategy.

7. **Implement car-sharing program:** This strategy reduces the need to own a vehicle or reduces the number of vehicles owned by a household by making it convenient to access a shared vehicle for those trips where vehicle use is essential. Examples include programs such as ZipCar, Car2Go, and Gig.

8. **Limit parking supply:** When combined with companion TDM measures, reduced parking supply discourages driving by limiting easy and convenient parking options. Implementation of this strategy may involve adjustments to parking requirements, allowing developers to use shared parking strategies, and potential other changes to the existing parking requirement adjustments present in City code.

9. **Unbundle parking costs:** Unbundling separates parking costs from property cost, for instance by not including a parking space in a residential unit’s rent, or by requiring employers to lease each parking space separately from the building owner. This strategy ensures that the user understands that the cost of driving includes parking and can encourage people to use an alternative mode to save money.

10. **Implement on-street market pricing for parking:** This strategy focuses on implementing a pricing strategy for parking by pricing all on-street parking in central business districts, employment centers, and retail centers. Priced parking would encourage “park once” behavior and may also result in area-wide mode shifts.

**Location Efficiency, Regional Policies, and Regional Infrastructure**

11. **Increase density of land uses:** This strategy focuses on increasing density of land uses, where allowed by the General Plan and/or Zoning Ordinance, to reduce distances people travel and provide more travel mode options. This strategy also provides a foundation for many other strategies. For example, densification makes it more efficient to operate increased transit services.

12. **Increase diversity of land uses:** This strategy focuses on inclusion of mixed uses within projects or in consideration of the surrounding area to minimize vehicle travel in terms of both the number of trips and the length of those trips.

13. **Increase transit accessibility:** This strategy focuses on encouraging the use of transit by locating a project with high density near transit. A project with a residential/commercial center designed around a transit hub is referred to as a transit-oriented development (TOD).

14. **Integrate affordable and below market rate (BMR) housing:** This strategy provides greater opportunities for lower-income families to live closer to job centers, which makes transit a more feasible commute mode, and also reduces the distance between workplaces and homes.

15. **Increase transit service frequency and speed:** This strategy focuses on improving transit service convenience and travel time competitiveness with driving. This could include changes to local Caltrain, VTA or SamTrans service, implementation of public shuttles, or other demand-responsive services. A demand-responsive service could be provided as subsidized trips by contracting to private TNCs or taxi companies. Alternatively, a public transit operator could provide the subsidized service but would need to improve on traditional cost effectiveness. Note that implementation of this strategy would require regional or local agency implementation,
substantial changes to current transit practices, and would not likely be applicable for individual development projects.

The 15 strategies listed above are those that may be most appropriate for the greatest range of projects in Palo Alto, based on the existing land use context and vision set forth in the Comprehensive Plan. However, in suburban environments, CAPCOA indicates that the maximum reasonable VMT reduction from all TDM measures combined will likely not exceed 15%. This research does not necessarily reflect the nature of employer shuttle and TDM programs in 21st Century Silicon Valley; however, it does present a general assessment of total VMT reduction potential for most development projects.

**New VMT Mitigation Concepts**

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

A jurisdiction’s transportation impact fee and CMP would not qualify as VMT impact mitigation programs if both programs are largely focused on vehicle capacity expansion or congestion management objectives. The current focus of many such programs is to expand roadway capacity to address vehicle LOS deficiencies. This strategy may have the result of inducing new vehicle travel that, in the long run, would diminish congestion relief benefits and generate new VMT and emissions. Refer to the following websites for more research information and technical details.

- [https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf](https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf)

Four possible mitigation approaches that do not focus on vehicle capacity improvements are described in the following sections:

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

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

VMT Cap

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

VMT Based Impact Fee Program

Although establishing any impact fee program is time consuming, it is a common and well-understood process governed by the Mitigation Fee Act. Using a VMT reduction goal linked to the agency’s SB 743 thresholds to establish the nexus would result in a capital improvement program (CIP) consisting mostly of transit, bicycle, and pedestrian projects. These types of fee programs are recognized as an acceptable form of CEQA mitigation if they can demonstrate that the CIP projects will be fully funded and implemented.

VMT Mitigation Exchange

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

VMT Mitigation Banks

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

**Summary of Mitigation Action Options**

Overall, CAPCOA indicates that projects in suburban areas may be able to achieve up to a 15% reduction in VMT. However, achieving this level of reduction requires that the project implement many individual project-level strategies (such as TDM and site design strategies) and be sited in an efficient, transit-adjacent location. In addition, project-level TDM strategies are often implemented by individual building tenants (i.e., employers), so their use requires ongoing monitoring and adjusting to account for changes in tenants and their travel behavior.

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

COMMON OPTIONS

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

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

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

- Impact fee program based on a VMT reduction nexus.
- In-lieu fee program for VMT reducing actions.
- VMT mitigation bank or exchange program.
- TDM ordinance applying to all employers.
Chapter 7. Implementation Actions for City of Palo Alto

As stated at the start of this document, the purpose of this white paper is to help the City of Palo Alto meet the new requirements of CEQA under SB 743 by providing curated SB 743 implementation information that includes substantial evidence to support decisions for VMT impact thresholds, metrics, VMT calculation methods, and VMT mitigation actions.

SB 743 takes full effect on July 1, 2020; after that time, all transportation impact analysis for CEQA must rely on VMT. CEQA Statute Section 21099(b)(2) states that upon certification of the 2018 CEQA Guidelines, LOS shall not be considered as a metric for measuring significant impact on the environment under CEQA. CEQA transportation studies should continue to evaluate the effect of a project on transit, pedestrian, and bicycle service or facilities as well as safety.

This chapter describes recommendations for initial VMT significance thresholds to be applied by the City of Palo Alto as of July 1, 2020. These recommendations are generally consistent with State guidance. Following the ongoing Sustainability and Climate Action Plan (S/CAP) Update, the City of Palo Alto will have the opportunity to review and adjust the CEQA VMT thresholds to align with the City's S/CAP goals or policies.

The Santa Clara County Valley Transportation Authority (VTA) is also preparing a forthcoming Santa Clara Countywide VMT Estimation Tool. This VMT tool can be used by Palo Alto staff to conduct a baseline VMT screening for land use projects that are exempt from further VMT analysis using project generated VMT thresholds and transportation priority areas.

VMT Significance Thresholds

The following recommendations for initial VMT significance thresholds to be applied by the City of Palo Alto as of July 1, 2020 are based largely on guidance provided by the Governor’s Office of Planning and Research (OPR). The following excerpt from the OPR Technical Advisory provides the overarching recommendation for VMT significance thresholds (Quote from page 10 of the Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018).

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

OPR recommends a series of baseline VMT screening thresholds to identify when a project should be expected to cause a less-than-significant impact without the need for a more complete VMT analysis. The City of Palo Alto would need to confirm that Cumulative VMT trends are not increasing over time to use this baseline VMT screening approach. This is similar to the process used by the City of Palo Alto and most agencies to determine when a detailed Level of Service (LOS) study should be conducted for a project.

The VMT screening process is for project types known to be low VMT generators or cause a reduction in VMT. The City of Palo Alto will screen projects that are deemed to be low VMT generators or reduce VMT based on criteria described in more detail below, with a qualitative discussion in the CEQA document. This screening approach enables project streamlining by eliminating the need to prepare a quantitative VMT analysis for low VMT-generating projects that meet the baseline VMT screening criteria. This is most appropriate for projects that are consistent with long-term air quality and greenhouse gas expectations and/or those that would reduce VMT based on their characteristics. As with all CEQA screening, an impact presumption of less-than-significant would be based on substantial evidence for the project.

Based on a review of project characteristics and related evidence, the City of Palo Alto may screen out VMT impacts for small projects, residential and office projects located in low-VMT areas, projects located in proximity to a major transit stop, affordable housing developments, local-serving retail projects, and transportation projects that would not result in an increase to vehicle capacity. Since land use plans affect a larger area and serve as the basis for environmental analysis of future projects, all land use plans (including the Comprehensive Plan, Precise Plans, and Specific Plans) would conduct a quantitative VMT analysis and not utilize screening.

Screening for Small Projects

The City of Palo Alto may choose to screen projects that generate less than 836 VMT per day. Based on research for small project triggers, this would equate to non-residential (e.g., office) projects of 10,000 square feet or less and multi-family residential projects of 20 units or less.

Screening for Projects Located in Low-VMT Areas

The City of Palo Alto may choose to screen residential and office projects located in low-VMT areas that incorporate similar features to the nearby developments (i.e., density, mix of uses, and transit accessibility) on the basis that the project will exhibit similarly low VMT.

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20 Residential projects that locate in areas 15% below existing regional home-based VMT per resident average (similar to county average), and office projects that locate in areas 15% below existing regional home-based work VMT per employee average (similar to county average) could presume to be low-VMT areas. These areas will be identified through a map-based screening using the Santa Clara Countywide VMT Estimation Tool developed by the Santa Clara County VTA.
Screening for Projects in Proximity to a Major Transit Stop

The City of Palo Alto may choose to screen projects that are located within a half mile of an existing major transit stop\(^{21}\) or an existing stop along a high quality transit corridor\(^{22}\).

Projects would not be screened, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. The presumption that a project would cause a less-than-significant impact might not be appropriate if a project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking than required by the City of Palo Alto
- Is inconsistent with the region’s Sustainable Communities Strategy, as determined by the City of Palo Alto with input from the Metropolitan Transportation Commission (MTC)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

Proximity to transit is explicitly listed in the CEQA Guidelines as a reason to presume a project has no significant impacts based on VMT. In Palo Alto, this includes the existing Caltrain stations (Downtown Palo Alto, California Avenue, and San Antonio stations) and at stops for bus routes with headways of 15 minutes or less (e.g., current high frequency bus routes are located along El Camino Real).

Screening for Affordable Housing

The City of Palo Alto may choose to screen residential projects containing a particular amount of affordable housing (based on local circumstances and substantial evidence as determined by the City) on the basis that affordable housing generates less VMT than market-rate housing. Affordable housing located within infill locations generally improves jobs-housing balance and may thus result in shorter commutes for low-income workers.

Screening for Local-Serving Retail

The City of Palo Alto would screen local-serving retail projects of less than 10,000 square feet, on the basis that they attract trips that would otherwise travel longer distances. The screening for local-serving retail also aligns with the small project screening described above. Regional-serving retail projects would not be screened out and would require a more complete VMT analysis.

\(^{21}\) Pub. Resources Code, § 21064.3 (“‘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 interval of 15 minutes or less during the morning and afternoon peak commute periods.”).

\(^{22}\) Pub. Resources Code, § 21155 (“For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.”).
Screening for Transportation Projects

The City of Palo Alto would screen transit projects, bicycle and pedestrian projects, and roadway operational improvement projects that do not result in a measurable or substantial increase in vehicle travel.

Numeric VMT Thresholds for Land Use Projects

The following VMT thresholds vary by project and land use type. The thresholds are based on applying one of the following VMT metrics.

- Total Project Generated VMT
- Partial Home-Based VMT per Resident
- Partial Home-Based Work VMT per Employee
- Project’s Effect on Total VMT within a selected geographic boundary

The description of thresholds below includes a discussion of the relative substantial evidence available. Regardless of the specific threshold the City selects, Palo Alto will still need to consider other substantial evidence related to VMT impacts when analyzing specific projects and making determinations of VMT impact significance.

Thresholds – Land Use Projects and Plans

The OPR baseline VMT screening threshold generally requires office and residential land use projects to achieve a VMT reduction of 15 percent below the city or regional (e.g., Bay Area or Santa Clara County) baseline average. Palo Alto is supportive of the State’s goal to reduce GHG emissions and has several Comprehensive Plan goals and policies that strive to reduce GHG emissions and air quality impacts, reduce single-occupancy vehicle use, and encourage multi-modal transportation.

In order to align the City with current state VMT reduction targets by July 1, 2020, the City will apply an initial set of VMT thresholds that are consistent with OPR’s recommendations. For individual land use projects that are not screened out and require a quantitative VMT assessment, this would mean the following:

- Residential projects – A proposed project exceeding a level of 15 percent below existing (baseline) County home-based VMT per resident may indicate a significant transportation impact.
- Office projects – A proposed project exceeding a level of 15 percent below existing (baseline) regional home-based work VMT per employee may indicate a significant transportation impact.
- Retail projects – A net increase in total (boundary) VMT may indicate a significant transportation impact.
• Mixed-use projects – The City will evaluate each component of a mixed-use project independently, and apply the above residential, office, or retail thresholds.

• Other project types – The City will either develop an Ad Hoc (i.e., project-specific) VMT threshold for a unique land use type or apply the most applicable of the above thresholds depending on project characteristics.

• Redevelopment projects – Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project may cause a less than significant VMT impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant VMT impact proposed new residential, office or retail land uses would individually exceed their respective thresholds.

• Land Use Plans – A comprehensive plan, area plan, or community plan may have a significant impact on transportation if the proposed new land uses would individually exceed their respective thresholds or cause the total project generated VMT per service population to exceed 15 percent below the baseline VMT per service population. Baseline total project generated VMT per service population may be measured as regional VMT per service population, a citywide VMT per service population, or as geographic sub-area VMT per service population.

When applying the above thresholds for residential or office uses, a project’s VMT is compared to a threshold based on the lower Countywide or regionwide baseline VMT value. Based on the baseline VMT data, the City of Palo Alto will compare home-based VMT per resident values for residential uses to a threshold based on the countywide averages for Santa Clara County. While for home-based work VMT per employee values for office uses a threshold will be based on the regionwide baseline VMT averages. The City of Palo Alto will be using the VTA travel model to conduct CEQA VMT assessments for larger projects that require a quantitative evaluation. The VTA travel model will be used both to identify the countywide and regionwide baseline VMT data used to establish the VMT threshold for office and residential uses as well as to estimate the project generated VMT rates for a quantitative VMT project assessment. The baseline VMT represents existing conditions and changes over time. The 15 percent reductions specified in the Technical Advisory for residential or office uses are based on light-duty vehicle project generated VMT (i.e., passenger cars and light-duty trucks).

These thresholds could be refined later, following adoption of the City’s Sustainability and Climate Action Plan (S/CAP). Refinements, if desired, would reflect more aggressive GHG reduction targets identified by the City in comparison to state targets.

Thresholds – Transportation Projects

OPR and Caltrans recommend that a net increase in total VMT may indicate a significant impact for transportation projects. A net decrease or no change in VMT would be evidence of a less than significant VMT impact.
• Transportation projects – A net increase in total VMT would indicate a significant transportation impact.

Projects that reduce or have no impact on VMT include most active transportation projects, road diets, and minor operational changes to local roadways. However, capacity increases (i.e., lane additions) on arterial roadways or roadways that carry regional traffic have the potential to induce new vehicle traffic, and therefore new VMT. As an example, adding an additional lane on an arterial street that reduces delay, may make driving even more competitive than walking, and shift some trips from walking to driving.

A no net new VMT threshold is recommended by Caltrans for assessment of impacts to Caltrans facilities based on interim guidance published in 2018. As a threshold, it is also reflective of whether a project simply improves operations for existing users (decreasing delay with no change in VMT) or if it also results induces demand for driving.

Next Steps

The following is a series of steps the City of Palo Alto may undertake to implement SB 743 and related programs.

• **Adopt a CEQA Analysis Approach:** The City Council would adopt, by resolution, VMT thresholds to be used for land use projects, land use plans, and transportation projects as recommended above.

• **Update Transportation Impact Analysis (TIA) Guidelines:** Based on City Council action on VMT thresholds, City staff would update transportation impact analysis guidelines that specify the process by which impacts due to new developments are identified. These guidelines should include specific performance measures and thresholds for the identification of impacts and mitigation measures in accordance with the new VMT analysis approach and Comprehensive Plan objectives.

• **TDM Ordinance Update:** To provide guidance and articulate expectations, the City’s TDM program would be updated including incorporating requirements of SB 1339. The purpose of a TDM program is to reduce vehicle trips and provide transportation options to achieve the City’s vision to improve the environment and quality of life for residents and employees.

• **2020 S/CAP:** Based on GHG reduction goals and strategies identified for the 2020 Sustainability and Climate Action Plan (S/CAP) Update, review and determine whether to adjust the CEQA VMT thresholds to align with the updated S/CAP.

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24 Senate Bill No. 1339 Commute benefit policies. (2011-2012)
• **Programmatic VMT Mitigation Options:** To provide programmatic options for projects to mitigate VMT impacts, consider implementation of VMT-based transportation impact fee program and/or local VMT Mitigation Exchange. As available, consider future VMT Mitigation Banks as mitigation options for projects.

• **Comprehensive Plan and EIR Update:** Rather than analyzing VMT for each proposed land use project individually, the City of Palo Alto may choose to utilize VMT analysis performed during the development of a Comprehensive Plan Update and EIR as the basis for determination of impact of proposed projects. Section 15183 of the CEQA Guidelines includes a potential exemption for consideration by lead agencies, particularly for addressing potential cumulative VMT impacts. Analyzing VMT impacts in a Comprehensive Plan EIR could help projects qualify for this exemption.

• **VMT as Measure of Congestion:** VMT may be used as a proxy or alternative to LOS, particularly to provide an indication of congestion over the city’s transportation network. This would be accomplished by isolating VMT that occurs during peak periods or on congested roadways (i.e., congested VMT). Congested VMT is commonly measured by accumulating VMT on roadway links with volume-to-capacity (V/C) ratios greater than 1.0 while peak period VMT tends to isolate the portion of daily VMT occurring during the morning and evening commute periods (e.g., 6-9 AM and 4-7 PM). Efforts to reduce peak period or congested VMT can have the co-benefit of reducing travel delays presuming the level of improvement does not induce new vehicle travel.
Appendix A: Summary Matrix of Decisions, Options, and Recommendations
## What form of VMT metrics could be used?

<table>
<thead>
<tr>
<th>Lead Agency Decisions</th>
<th>Common Options</th>
<th>Common Limitations</th>
<th>Considerations</th>
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<tbody>
<tr>
<td>What form of VMT metrics could be used?</td>
<td>1. Total Project Generated VMT</td>
<td>Metrics other than total project generated VMT and total project generated VMT per service population typically only represent partial VMT, i.e., some vehicle types and trip purposes are excluded in the models used to estimate VMT. This may be acceptable for screening purposes but not for a complete VMT impact analysis. Project-generated VMT metrics cannot capture how a project changes behavior of non-project residents or employees.</td>
<td>The expectations of a CEQA impact analysis to strive to provide a complete picture of the effects of a project on the environment are highlighted within the CEQA Guidelines. For lead agencies, VMT metrics and method should consider current practice for air quality, greenhouse gases, and energy consumption impact analysis. In general, VMT is used as an input for these other analyses and current practice is to produce VMT estimates and forecasts that comply with CEQA Guidelines expectations.</td>
<td>Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds. Include the following so that all forms of VMT needed for screening and complete VMT analysis are available. 1. Total Project Generated VMT 2. Total Project Generated VMT per Service Population 3. Home-based VMT per Resident 4. Home-based work VMT per Employee 5. Boundary VMT for an appropriate area affected by the Project (needed for air quality, GHG, and energy analysis)</td>
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<td>2. Total Project Generated VMT per Service Population</td>
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<td>3. Household generated VMT per Resident (requires an activity/tour-based travel forecasting model)</td>
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<td>4. Home-Based VMT per Resident (a partial VMT estimate)</td>
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<td>5. Home-Based Work VMT per Employee (a partial VMT estimate)</td>
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<td>6. Project's Effect on VMT using Boundary VMT for a specific area</td>
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### Metrics other than total project generated VMT and total project generated VMT per service population typically only represent partial VMT, i.e., some vehicle types and trip purposes are excluded in the models used to estimate VMT. This may be acceptable for screening purposes but not for a complete VMT impact analysis. Project-generated VMT metrics cannot capture how a project changes behavior of non-project residents or employees.

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

## What methods are available to use in estimating and forecasting VMT?

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<tr>
<td>What methods are available to use in estimating and forecasting VMT?</td>
<td>1. Caltrans Statewide Travel Demand Model</td>
<td>Statewide and regional models have limited sensitivity and accuracy for local scale applications off the shelf. Regional and local models often truncate trips at model boundaries. Sketch and spreadsheet tools do not capture the 'project effect on VMT'.</td>
<td>Selection of an appropriate travel forecasting approach is an important step because the tool used to develop VMT thresholds must also be used to evaluate a project's direct and cumulative VMT impacts. Regional or local models should be calibrated and validated for local project-scale sensitivity/accuracy (including appending trip length data for trips with external trip ends) before using these models to analyze both 'project generated VMT' and 'project effect on VMT'.</td>
<td>Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds. Use the Santa Clara Countywide VMT Evaluation Tool for baseline VMT screening. And most likely the VTA-C/CAG Bi-County Travel Forecasting Model, Local City of Palo Alto Travel Forecasting Model, or Non-model “Accounting Methods” such as sketch planning tool or spreadsheet for more complete VMT analysis.</td>
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<tr>
<td>2. Metropolitan Transportation Commission (MTC) Regional Travel Forecasting Model</td>
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<tr>
<td>3. VTA-C/CAG Bi-County Travel Forecasting Model</td>
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<tr>
<td>4. Non-model “Accounting Methods” such as sketch planning tool or spreadsheet</td>
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### Selection of an appropriate travel forecasting approach is an important step because the tool used to develop VMT thresholds must also be used to evaluate a project's direct and cumulative VMT impacts. Regional or local models should be calibrated and validated for local project-scale sensitivity/accuracy (including appending trip length data for trips with external trip ends) before using these models to analyze both 'project generated VMT' and 'project effect on VMT'.

## References

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

2. Sketch planning tool or spreadsheet method has limitations if using a citywide or regional average for a threshold.
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<tr>
<td>Is use of VMT impact screening desired?³</td>
<td>Projects that reduce VMT or are located within transit priority areas (TPAs) should be presumed to have a less than significant impact on VMT. Additional screening options identified in the OPR Technical Advisory: 1. Map based screening for residential and office projects 2. Local-Serving Retail Projects 3. Transportation projects that do not add vehicle capacity 4. Projects that would not result in a net increase of VMT 5. Affordable housing projects 5. Small projects</td>
<td>Screening does not provide information about the actual VMT changes associated with the project.</td>
<td>Screening most appropriate if consistent with applicable general plan and supported by substantial evidence.</td>
<td>Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds Rely on screening if consistent with applicable comprehensive plan and supported by substantial evidence demonstrating cumulative VMT is declining. For project-by-project VMT analysis with VMT screening, most projects will likely not screen out, which will require a more complete VMT analysis. Apply screening for the following project types: • Small Developments • Projects in Low-VMT Areas • Projects in Proximity to Major Transit Stops • Affordable Housing • Local-Serving Retail Projects less than 10,000 square feet • Transportation Projects that do not add vehicle capacity The Santa Clara Countywide VMT Estimation Tool will be applied for screening as follows: • Low VMT generation map-based screening of residential, office, and industrial land uses, those land uses in combination with each other, and those land uses with or without local serving retail space. • A transit priority areas (TPAs)/major transit stops and high-quality transit corridor (HQTC) screen.</td>
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³ CEQA Guidelines Section 15064.3 states that projects that would reduce VMT or are located in a TPA should be presumed to have a less than significant impact on VMT. The OPR Technical Advisory contains other potential screening options.
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| 1. Lead agency discretion consistent with general plan and expectations for project scale VMT reductions not accounted for in general plan EIR and supported by substantial evidence. | Difficult for lead agencies to determine what level of VMT change is unacceptable when viewed solely through a transportation lens. Uncertainty of VMT trends contributes to difficulty in setting thresholds. Connecting a VMT reduction expectation to baseline helps to reduce uncertainty associated with future conditions. | Since VMT is already used in air quality, GHG, and energy impact analysis, lead agencies should review thresholds for those sections to help inform new thresholds exclusively for transportation purposes. Lead agencies should carefully consider how they value state goals for VMT/GHG reduction in light of other general plan and community objectives. Translating state goals into VMT thresholds should consider substantial evidence such as California Air Resources Board 2017 Scoping Plan - Identified VMT Reductions and Relationships to State Climate Goals, January 2019, CARB. | Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds:  
- Residential projects: A proposed project exceeding 15 percent below existing (baseline) County home-based VMT per resident may indicate a significant transportation impact.  
- Office projects: A proposed project exceeding a 15 percent below existing (baseline) regional home-based work VMT per employee may indicate a significant transportation impact.  
- Retail projects: A net increase in total (boundary) VMT may indicate a significant transportation impact.  
- Mixed-use projects: Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project’s dominant use. In the analysis of each use, a project should take credit for internal capture.  
- Other non-residential project types: OPR recommends using the quantified thresholds above, thus a proposed project exceeding a level of 15 percent below existing regional VMT per employee for the proposed non-residential project type or resulting in a net increase in total VMT may be considered significant. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types.  
- Redevelopment projects: Where a proposed project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would cause a less than significant transportation impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant transportation impact if proposed new residential, office or retail land uses would individually exceed their respective thresholds.  
- Area Plans: A comprehensive plan, area plan, or community plan may have a significant impact on transportation if the proposed new land uses would individually exceed their respective thresholds or cause the total project generated VMT per service population to exceed 15 percent below the baseline VMT per service population. Baseline total project generated VMT per service population may be measured as regional VMT per service population, a citywide VMT per service population, or as geographic sub-area VMT per service population. |  |
| 2. OPR 15% below baseline average of jurisdiction (light-duty vehicles only) | | |  |
| 3. CARB 14.3% below baseline (2018) average of jurisdiction (all vehicles) | | |  |
| 4. CARB 16.8% below baseline (2018) average of jurisdiction (light-duty vehicles only) | | |  |
| 5. Pending Caltrans-recommended threshold (net zero VMT) | | |  |

Option 2 Far-Term: Set Thresholds Consistent with the 2020 S/CAP or Comprehensive Plan Future Year VMT Projections

Set baseline VMT threshold based on long-term Comprehensive Plan expectations for air quality and GHG emissions. The analysis to determine these thresholds would be completed if the City Council selects this option. An example threshold: X% below baseline VMT per capita average of City, County or region (all vehicles, and trip purposes) Example baseline thresholds are as follows.

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

- **Land Use Plans:**
  - Project Impact: A significant impact would occur if the VMT rate for the plan area would exceed a level of X% below the applicable baseline VMT rate.

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

5 Caltrans has released draft Interim Guidance on “Determining CEQA Significance for GHG Emissions for Projects on the State Highway System” that recommends that any increase in GHG emissions would constitute a significant impact. This has been referred to as the “Net Zero VMT threshold”. Caltrans has thus far signaled that this threshold would be applied only to transportation projects.
## What is the VMT impact significance threshold for land use projects under cumulative conditions?

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<tr>
<td>1. Use a regional model to analyze the project's effect on VMT based on RTP/SCS consistency (projects should not increase the total regional VMT (either project generated or boundary VMT) forecast used to support the RTP/SCS air quality conformity and SB 375 GHG targets).</td>
<td>Uncertainty of VMT trends makes a cumulative impact finding less certain. Ability for a lead agency to identify the project's effect on land supply and corresponding VMT. Land use projects change land supply and the allocation of future population and employment growth. As such cumulative analysis should maintain the same control totals of regional population and employment growth. Requires knowledge of the forecasting tools available to test the project's effect on land supply and VMT.</td>
<td>Analyze the project's effect on land supply and VMT using an appropriate valid model. For impact findings, consider all available substantial evidence including 2018 Progress Report, California's Sustainable Communities and Climate Protection Act, November 2018, CARB and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Specific research examples include Fehr &amp; Peers AV effect model testing.</td>
<td>Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds&lt;br&gt;OPR does not present cumulative thresholds. Analyze the project's effect on land supply and VMT using an appropriately valid travel model. For impact findings, consider all available substantial evidence including California Air Resources Board 2017 Scoping Plan Identified VMT Reductions and Relationships to State Climate Goals, January 2019, and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). The following are suggested cumulative thresholds.</td>
<td>Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds&lt;br&gt;OPR does not present cumulative thresholds. Analyze the project's effect on land supply and VMT using an appropriately valid travel model. For impact findings, consider all available substantial evidence including California Air Resources Board 2017 Scoping Plan Identified VMT Reductions and Relationships to State Climate Goals, January 2019, and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). The following are suggested cumulative thresholds.</td>
</tr>
<tr>
<td>2. A lead agency can use the project analysis above if based on an efficiency metric form of VMT and evidence exists to demonstrate that cumulative trends in VMT rates are declining.</td>
<td>• Land Use Projects:</td>
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<tr>
<td>3. Establish a VMT reduction threshold for cumulative conditions consistent with long-term air pollution and GHG reduction expectations.</td>
<td>• Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.</td>
<td>• Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.</td>
<td>• Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.</td>
<td>• Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.</td>
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</tbody>
</table>

## What is the VMT impact significant threshold for transportation projects under baseline conditions?

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

<table>
<thead>
<tr>
<th>Lead Agency Decisions</th>
<th>Common Options</th>
<th>Common Limitations</th>
<th>Considerations</th>
<th>City of Palo Alto Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Continuation use of LOS is uncertain because of CEQA Guidelines Section 15064.3(b)(2) and 15064.7(d)(2). Transit, especially on-demand transit service, can generate new VMT, which should be considered as part of impact conclusions.</td>
<td>Consult CEQA legal advice about whether lead agency discretion allows continued use of LOS and whether VMT is required. VMT is required as an input to air quality, GHG, and energy impact analysis and should include induced vehicle travel effects.</td>
<td>Option 1: Rely on OPR Technical Advisory Thresholds&lt;br&gt;• Baseline Transportation Threshold: A significant impact would occur if a project causes a net increase in total regional VMT compared to baseline conditions or opening year no project conditions.&lt;br&gt;• Cumulative Transportation Threshold: A significant impact would occur if the project causes a net increase in total regional VMT compared to cumulative no project conditions.</td>
<td>Option 2: Set Thresholds Consistent with the 2020 S/CAP or Comprehensive Plan Future Year VMT Projections&lt;br&gt;Use the same cumulative thresholds as Option 1.</td>
<td></td>
</tr>
<tr>
<td>• OPR recommends treating projects that reduce, or have no impact on, VMT to be presumed to have a less than significant impact.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Option 1 Near-Term: Rely on the OPR Technical Advisory Thresholds

- **Land Use Projects:**
  - Project Effect: A significant impact would occur if the project increases total regional VMT compared to cumulative no project conditions.
  - Transportation Projects: A significant impact would occur if the project causes a net increase in total regional VMT compared to cumulative no project conditions.

### Option 2 Far-Term: Set Thresholds Consistent with the 2020 S/CAP or Comprehensive Plan Future Year VMT Projections

Use the same cumulative thresholds as Option 1.
Appendix A: City of Palo Alto SB743 Implementation: Summary of Decisions, Options, and Recommendations

<table>
<thead>
<tr>
<th>Lead Agency Decisions</th>
<th>Common Options</th>
<th>Common Limitations</th>
<th>Considerations</th>
<th>City of Palo Alto Recommendations</th>
</tr>
</thead>
</table>
| **What VMT reduction mitigation strategies are feasible?** | Menu of built environment and transportation demand management (TDM) mitigation strategies contained in Quantifying Greenhouse Gas Mitigation Strategies, CAPCOA, 2010. | Built environment strategies require modifying the project, which may create inconsistencies with the project description and financial feasibility. TDM strategies are often building tenant dependent so their use requires ongoing monitoring and adjusting to account for changes in build tenants and their travel behavior. Ad-hoc project-by-project mitigation is less effective for reducing VMT than larger scale program-based approaches such as an impact fee program. | Develop a VMT mitigation program using any of the following approaches.  
1. Impact fee program based on a VMT reduction nexus.  
2. In-lieu fee program for VMT reducing actions.  
3. VMT mitigation bank or exchange program.  
4. TDM ordinance applying to all employers. | **VMT Impact Mitigation Strategies**  
Apply relevant mitigation strategies from one of the following four VMT mitigation categories in near-term.  
- Change the project land use mix or density  
- Reduce proposed vehicle parking supply levels  
- Implement on-site or off-site capital improvements for transit, bicycle, or pedestrian travel  
- Implement trip reduction programs as described in a Transportation Demand Management (TDM) program  
Adopt Updated TDM Ordinance.  
In long-term, consider other available new options such as VMT Mitigation Bank or Exchange. |
Appendix B: VMT Threshold Examples
# Adopted VMT Thresholds

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

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Potential Threshold</th>
</tr>
</thead>
</table>
| Santa Barbara County      | **Option 1:** Daily VMT is no higher than the baseline regional average VMT  
**Option 2:** Daily VMT is at least 16.8% below baseline conditions (refers to CARB target) |
| City of South San Francisco | 15% below regional VMT per capita                                                                                                                      |
| City of San Bruno         | 14.3% below existing VMT per service population (based on CARB assessment)                                                                               |
| Nevada County             | **Option 1:** Total weekday VMT per service population is less than or equal to the baseline subarea average  
**Option 2:** Consistent with the jurisdiction’s general plan and the Nevada County Regional Transportation Plan |
Appendix C: Comparison of Available Travel Forecasting Models
Appendix C – Travel Model Comparison

Date: May 29, 2020
To: Joanna Chan and Sylvia Star-Lack, City of Palo Alto
From: Bob Grandy, Daniel Rubins and Teresa Whinery, Fehr & Peers
Subject: Comparison of Available Travel Forecasting Models for the City of Palo Alto

Comparison of Available Travel Demand Models for the City of Palo Alto

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

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

¹ Also considered was the Caltrans Statewide Travel Demand Model; however, the Caltrans travel forecasting model is meant for statewide analysis and does not have enough detail in the travel forecasting model to be applied in the City of Palo Alto.
The MTC travel model is an activity-based (or tour-based) model, meaning it can track VMT separately for different categories of people (residents, workers, students). Our investigations and applications of the MTC travel model have revealed the use of input parameters that are not reasonably foreseeable, such as land use growth allocations inconsistent with local general plans, substantial increases in telecommuting or other TDM strategies, and implementation of travel pricing.

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

Additional detail is summarized below for the MTC and VTA travel models based on Association of Bay Area Government (ABAG) 2017 land use projections (Plan Bay Area 2040 land use projections) and future regional transportation infrastructure consistent with Plan Bay Area 2040 (July 2017).

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

**Travel Analysis Zones**

Land use and socioeconomic data are represented in models by Travel Analysis Zones, or TAZs. A comparison of various TAZ elements between the MTC and VTA travel models is provided in Table 1. In summary, the VTA travel model TAZ system has a higher resolution than the MTC travel model, in addition to more precise alignment with freeways, as well as city/town and natural boundaries. The MTC travel model TAZ system is less refined within Palo Alto, which could result in a higher percentage of internalized trips and a more incomplete accounting of VMT generated by projects in the City of Palo Alto.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>MTC Travel Model</th>
<th>VTA Travel Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Coverage</td>
<td>Nine-county Bay Area.</td>
<td>Nine-county Bay Area, AMBAG (3 counties), and portions of Central Valley.</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>Coarse TAZ system, roughly matching Census Tract geography.</td>
<td>Smaller TAZ system than the MTC travel model, allowing for more land use detail in San Mateo County and Santa Clara County.</td>
</tr>
<tr>
<td>Alignment</td>
<td>Boundaries are generally aligned with natural and freeway boundaries, but does not match boundaries for all communities due to larger size of zones.</td>
<td>Boundaries are more precisely aligned to natural and manmade boundaries (e.g. city boundaries, freeways, main thoroughfares, etc.).</td>
</tr>
<tr>
<td>Land Use Input Type</td>
<td>Model utilizes separate year-specific land use input files for each scenario that include year-specific socio-economic data.</td>
<td>Model utilizes separate year-specific land use input files for each scenario that include year-specific socio-economic data.</td>
</tr>
</tbody>
</table>

**Summary**

The MTC travel model TAZ system is less refined within Santa Clara County and significantly less refined within the unincorporated portions of the county, which could result in a higher percentage of internalized trips and a more incomplete accounting of localized VMT generated by projects in Palo Alto and Santa Clara County. The VTA travel model TAZ system has a higher resolution, as well as more precise alignment with freeways and city/natural boundaries; may result in more complete VMT estimates.


**Highway Network**

The highway networks between the MTC and VTA travel models were compared, as summarized in Table 2. Based on our review, the VTA travel model network is more detailed than the MTC travel model network, although both have a very coarse level of roadway representation for local roads in areas west of I-280.
Table 2: Highway Network Comparison

<table>
<thead>
<tr>
<th>Criteria</th>
<th>MTC Travel Model</th>
<th>VTA Travel Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Detail</td>
<td>Low-Medium: Network only includes major collectors and above streets.</td>
<td>Medium-High: Network includes some local streets and minor collectors and above streets. Network west of I-280 includes</td>
</tr>
<tr>
<td>Centroid Connectors</td>
<td>Collectors and residential streets are generally represented by centroid connectors.</td>
<td>Residential streets are generally represented by centroid connectors.</td>
</tr>
<tr>
<td>Attributes</td>
<td>Link: List of attributes include distance, number of lanes, improvement years, area type, facility type, free flow speed, travel time, capacity, etc.</td>
<td>Link: Similar to MTC travel model.</td>
</tr>
<tr>
<td></td>
<td>Speed/Capacity: Uses speed/capacity look-up table (limited capacity to modify link speed/capacity).</td>
<td>Speed/Capacity: Similar to MTC travel model.</td>
</tr>
<tr>
<td></td>
<td>Node: Nodes do not have detailed attributes.</td>
<td>Node: Similar to MTC travel model.</td>
</tr>
<tr>
<td>Network Type</td>
<td>Model utilizes separate year-specific highway network input files for each scenario.</td>
<td>Similar to MTC travel model</td>
</tr>
<tr>
<td>Non-Auto Modes</td>
<td>Non-motorized skims and transit accessibility.</td>
<td>Non-motorized skims and transit accessibility.</td>
</tr>
<tr>
<td>Summary</td>
<td>The network has a reasonable amount of detail but not a sufficient amount to accurately measure VMT in unincorporated areas, particularly west of I-280.</td>
<td>Regional roadways and major arterial. More detailed roadway networks in both San Mateo and Santa Clara counties. The network has more detail than the MTC travel model and the ability to estimate VMT to the minor arterial/collector level.</td>
</tr>
</tbody>
</table>


Model Methods

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

<table>
<thead>
<tr>
<th>Criteria</th>
<th>MTC Travel Model</th>
<th>VTA Travel Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime</td>
<td>Base year model runtime of roughly 24 hours on a server-based computer with 32 computing cores and 128 GB of RAM.</td>
<td>Base year model runtime of roughly 8 to 12 hours on virtually any desktop machine.</td>
</tr>
<tr>
<td>Type</td>
<td>4-step model</td>
<td>4-step model</td>
</tr>
<tr>
<td>Type</td>
<td>Activity-based model: socio-economic-based trip generation at the person-level that maintains a linkage of trips throughout the day to ensure modal consistency, making it capable of measuring VMT generated by residents and workers separately, as well as a total measure of VMT generation.</td>
<td>Trip-based model: socio-economic-based trip generation that gets generalized and aggregated into unlinked trips at the TAZ-level, making it difficult to measure VMT generated by residents and workers separately but fully capable of providing a total measure of VMT generation.</td>
</tr>
<tr>
<td>Model Software</td>
<td>Citilabs – Cube/Voyager</td>
<td>Citilabs – Cube/Voyager</td>
</tr>
<tr>
<td>Platform</td>
<td>Java, R</td>
<td>None</td>
</tr>
<tr>
<td>Other Required</td>
<td>Python Windows Server</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use</td>
<td>Few consultants and no municipal agencies will have access to a server-based multi-core platform and the Java expertise required to run the model, limiting the pool of potential users of the model. There is not a few to use the MTC travel model, but specialized software and knowledge is needed to run it properly.</td>
<td>VTA staff has access to edit the model, and VTA member agencies use the model based on the terms of a model use agreement (a fee is charged to member agencies to acquire the travel model). Non-member agencies, consultants, and developers have limited access to the travel model.</td>
</tr>
<tr>
<td>Base Year</td>
<td>2015</td>
<td>2015</td>
</tr>
<tr>
<td>Forecast Years</td>
<td>2020 2030 2035 2040</td>
<td>2025 (an intermediate scenario) 2040</td>
</tr>
<tr>
<td>Summary</td>
<td>The MTC travel model can only be run on a server-based computer by a small handful of consultants and is capable of measuring VMT generated by residents and workers separately.</td>
<td>The VTA travel model can be run in 8 to 12 hours on virtually any desktop machine by most agency staff or consultants; a trip-based model type makes it difficult to measure VMT generated by residents and workers that is not home-based or work-based.</td>
</tr>
</tbody>
</table>

Appendix D: Additional VMT Thresholds Background and Options Discussion
Appendix D – VMT Thresholds

Date: May 29, 2020
To: Joanna Chan and Sylvia Star-Lack, City of Palo Alto
From: Bob Grandy, Daniel Rubins and Teresa Whinery, Fehr & Peers
Subject: Additional Background on VMT Thresholds

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

VMT Thresholds

Background on CEQA Thresholds

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

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

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

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

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

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

New Section 15064.3. Determining the Significance of Transportation Impacts.

(a) Purpose.

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

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

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

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

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

(c) Applicability.

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


Appendix D – VMT Thresholds

§ 15064.7. Thresholds of Significance.

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

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

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

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

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

2. adopted for the purpose of environmental protection;

3. addresses the environmental effect caused by the project; and,

4. applies to the project under review.

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

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

**OPR VMT Threshold Recommendations for Land Use Projects**

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

- *New methodologies under the California Environmental Quality Act are needed for evaluating transportation impacts that are better able to promote the state’s goals of reducing greenhouse gas emissions and traffic-related air pollution, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations.*

- *More appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions.*

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

**CEQA Guidelines Section 15064.3**

*(b) Criteria for Analyzing Transportation Impacts.*

*(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.*
(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

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

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

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

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

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

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

- **Senate Bill 32** (2016) requires at least a 40% reduction in greenhouse gas emissions by 2030.
- Pursuant to **Senate Bill 375** (2008), the California Air Resources Board establishes greenhouse gas reduction targets for MPOs to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies. At the time the Technical Advisory was released, target reductions
Appendix D – VMT Thresholds
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by 2035 for the largest MPOs ranged from 13% to 16%. The current targets for these MPOs are 19%.

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

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

*The VMT metric can support the three statutory goals: “the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” (Public Resources Code, § 21099, subdivision (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.*
While this is one of the SB 743 legislative intent objectives, a less clear connection is made to the other legislative intent objectives to encourage infill development and promote active transportation. SB 743 [Section 21099(b)(1)] also makes it explicit that criteria for determining the significance of transportation impacts shall promote “...the reduction of greenhouse gas emissions, the development of multimodal networks, and a diversity of land uses.” If GHG impacts are already being adequately addressed in another CEQA section, then more evidence may be desired about VMT threshold relationships to the other criteria. In particular, how should lead agencies balancing the accommodation of housing needs that contribute to land use diversity but also contribute to VMT increases? Given the status of housing supply shortages and affordability in California, this is not a small issue. The use of VMT as a new impact metric will likely trigger more significant impacts in suburban and rural areas that have the highest VMT generation rates and limited or costly mitigation options. Adding more impact mitigation costs to suburban and rural housing projects may be counter to land use diversity and adequate/affordable housing goals.

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

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

**Lead Agency Discretion in Setting VMT Thresholds**

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

- **Question 1:** Do lead agencies have discretion to set a different VMT threshold than recommended by OPR?
• **Question 2:** Do lead agencies need to establish VMT thresholds for cumulative impacts?
• **Question 3:** Do lead agencies need to use the same VMT methodology for setting thresholds and for conducting project VMT forecasts?

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

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

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

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

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

In addition to direct impact analysis, lead agencies should address VMT impacts in the cumulative context. The CEQA Guidelines (and the case law) are clear that consideration of cumulative impacts is important to CEQA compliance. That said, a separate quantitative threshold may not be required if the threshold applied for project-specific impacts is cumulative in nature. VMT thresholds based on an efficiency form of the metric, such as VMT per capita, can address both project and cumulative impacts in a similar manner that some air districts do for criteria pollutants and GHGs.
As explained in OPR’s *Technical Advisory*, when using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate.

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

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

**Figure 1: California VMT Trends**

![Statewide CO₂ and Vehicle Miles Traveled (VMT) Per Capita Trend with Respect to Anticipated Performance of Current SB 375 SCSs²](image)

Source: 2018 Progress Report California’s Sustainable Communities and Climate Protection Act, California Air Resources Board, 2018
For some projects, measuring project-generated VMT will only tell part of the impact story, especially if they exceed a project threshold based on VMT per capita or a similar efficiency metric. Measuring the “project’s effect on VMT” may be necessary to fully explain the project’s impact, especially under cumulative conditions. This occurs because of the nature of discretionary land use decisions. Cities and counties influence land supply through changes to general plan land use designations and zoning for parcels. These changes rarely, if ever, influence the long-term amounts of regional population and employment growth. Viewed through this lens, a full disclosure of VMT effects requires capturing how a project may influence the VMT generated by the project and nearby land uses. Also, some mitigation strategies that improve walking, bicycling, or transit to/from the project site can also reduce VMT from neighboring land uses (for example, installing a bike-share station on the project site would influence the riding behavior of project residents and those living and working nearby).

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

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

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

<table>
<thead>
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<th>VMT Method</th>
<th>Existing Home-Based VMT per Capita</th>
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<tr>
<td></td>
<td>City (9.86)</td>
<td>Region (11.97)</td>
</tr>
<tr>
<td>Travel demand model</td>
<td>9.86 (8.38)</td>
<td>11.97 (10.17)</td>
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<tr>
<td>ITE + CHTS</td>
<td>23.90 (20.32)</td>
<td>25.67 (21.82)</td>
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produce thresholds, but it does not include a similar recommendation for trip generation rates. Input variables, trip lengths, and trip generation rates need to be consistent with the travel forecasting model to produce accurate project impact analysis results.

**Options for the City of Palo Alto**

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

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

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

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

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

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

15130. DISCUSSION OF CUMULATIVE IMPACTS

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

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

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

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

Each of these options is discussed below.

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

The first option is to simply rely on the threshold recommendations contained in the OPR Technical Advisory. As noted above, the general expectation is that land use projects should be measured against VMT per capita or VMT per worker threshold of 15% below that of baseline conditions (i.e., existing development). Specific VMT thresholds for residential, office (work-related), and retail land uses are summarized below.
• **Residential projects** – A proposed project exceeding a level of 15% below existing (baseline) VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita, a citywide VMT per capita, or as geographic sub-area VMT per capita.

• **Office projects** – A proposed project exceeding a level of 15% below existing (baseline) regional VMT per employee may indicate a significant transportation impact.

• **Retail projects** – A net increase in total (boundary) VMT may indicate a significant transportation impact.

• **Mixed-use projects** – Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project’s dominant use. In the analysis of each use, a project should take credit for internal capture.

• **Other non-residential project types** – OPR recommends using the quantified thresholds above, thus a proposed project exceeding a level of 15 percent below existing regional VMT per employee for the proposed non-residential project type or resulting in a net increase in total (boundary) VMT may be considered significant. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types.

• **Redevelopment projects** – Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

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

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

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

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

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

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

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

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

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

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

**Figure 2: Statewide Total VMT/Capita**

![Figure 2: Statewide Total VMT/Capita](https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf)

Source: 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, CARB (p. 10)

**Figure 3: Statewide Light-Duty VMT/Capita**

![Figure 3: Statewide Light-Duty VMT/Capita](https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf)

Source: 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, CARB (p. 11)
One benefit of relying on CARB or other state agencies for a threshold recommendation is the CEQA Guidelines provision in Section 15064.7(c) highlighted below.

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

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

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

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

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

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

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

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

VMT is a composite metric that is created as an output of combining a community’s long-term population and growth projections with its long-term transportation network (i.e., the General Plan). Other variables are also in play related to travel behavior, but land use changes and transportation network modifications are the items largely influenced or controlled by cities and counties. As such, each jurisdiction already has a VMT growth budget. This is the amount of VMT that is forecast to be generated from the jurisdiction’s General Plan and the jurisdiction’s buildout scenario assumptions combined with other travel behavior inputs for the region as captured in the travel forecasting model. This VMT growth has already been planned for and determined to be “acceptable” by the jurisdiction. Regional and state agencies also use the General Plan growth as part of their plans and environmental impact analysis. This level of VMT could serve as the basis of a VMT threshold expressed as a VMT growth budget or as a VMT efficiency metric based on the future year VMT per capita, VMT per employee, or VMT per service population. The measurement of VMT could occur at the geographic subarea level.
Potential limitations of this approach relate to the lack of a “baseline plus project” analysis and travel forecasting model sensitivity. If a General Plan includes policies or implementation programs designed to reduce VMT through transportation demand management (TDM) strategies, the current local and regional models did not include these effects. Further, current local and regional models do not capture major disruptive trend effects such as TNCs, AVs, and internet shopping. Including baseline and baseline plus project analysis could help capture some of these effects to the extent they are already influencing travel behavior.

**Option 4: Set thresholds based on baseline VMT performance**

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

Under this option, a separate quantitative VMT threshold may not be set for cumulative conditions unless VMT trends are increasing over time. At a minimum, a qualitative assessment of RTP and General Plan consistency may still be included, depending on whether that analysis is already being conducted for the purposes of GHG impact analysis. In general, projects should avoid jeopardizing the air quality conformity and GHG reduction performance of other relevant plans.
Appendix E: Small Project Guidance
SMALL PROJECT SCREENING FOR SB743

The following document provides substantial evidence to support the screening on ‘small’ projects for SB 743 purposes. The OPR Technical Advisory relies on a trip trigger based on CEQA exemptions.

Two potential limitations of this trigger have been identified. First, the trigger is not tied to a VMT estimate. Second, the trigger does not consider residential land uses. To strengthen the evidence, we used specific CEQA exemptions related to residential projects and 2012 California Household Travel Survey (CHTS) household VMT estimates to develop the following modification to the OPR approach. The CEQA exemption sections are provided below (yellow highlight added).

15303. NEW CONSTRUCTION OR CONVERSION OF SMALL STRUCTURES

Class 3 consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. The numbers of structures described in this section are the maximum allowable on any legal parcel. Examples of this exemption include, but are not limited to:
(a) One single-family residence, or a second dwelling unit in a residential zone. In urbanized areas, up to three single-family residences may be constructed or converted under this exemption.

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

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

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

15315. MINOR LAND DIVISIONS
Class 15 consists of the division of property in urbanized areas zoned for residential, commercial, or industrial use into four or fewer parcels when the division is in conformance with the General Plan and zoning, no variances or exceptions are required, all services and access to the proposed parcels to local standards are available, the parcel was not involved in a division of a larger parcel within the previous 2 years, and the parcel does not have an average slope greater than 20 percent.

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

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

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

SACOG Average – 42.9 VMT per household
- 2 units = 85.8 VMT per day
- 4 units = 171.6 VMT per day
- 6 units = 257.4 VMT per day (urban areas only)

Another option is to rely on the maximum level of development allowed by CEQA exemptions and convert that value to a ‘dwelling unit equivalent’ measure similar to impact fee programs. OPR estimated that non-residential uses could generate 110-124 daily trips based on a maximum project exemption size of 10,000 square feet (KSF). Using the lower end of the range and CHTS trip lengths produces a VMT equivalent for 10 KSF for CA and SACOG of 836 and 869, respectively. This equates to about 20 residential households.
Appendix F: VMT Characteristics in Palo Alto
## VMT Characteristics in Palo Alto

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<tr>
<th>VMT Metric</th>
<th>2015 Baseline – Average VMT Value</th>
<th>2040 Cumulative – Average VMT Value</th>
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<tr>
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<td>City of Palo Alto</td>
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<td>Home-Based VMT per Resident</td>
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<td>(for office uses)</td>
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Source: Santa Clara County Valley Transportation Authority (VTA), 2020.
Appendix G: Comparison of CAPCOA Strategies Versus Research Since 2010
## Land Use/Location 3.1.1 LUT-1 Increase Density

**0.8% - 30% VMT reduction due to increase in density**

Adequate

Increasing residential density is associated with lower VMT per capita. Increased residential density in areas with high jobs access may have a greater VMT change than increases in regions with lower jobs access. The range of reductions is based on a range of elasticities from -0.04 to -0.22. The low end of the reductions represents a -0.04 elasticity of demand in response to a 10% increase in residential units or employment density and a -0.22 elasticity in response to a 50% increase to residential/employment density.

0.4% - 10.75%

**Primary sources:**

**Secondary sources:**

## Land Use/Location 3.1.9 LUT-9 Improve Design of Development

**3.0% - 21.3% reduction in VMT due to increasing intersection density vs. typical ITE suburban development**

Adequate

No update to CAPCOA literature; advise applying CAPCOA measure only to large developments with significant internal street structure.

Same

**N/A**

## Land Use/Location 3.1.4 LUT-4 Increase Destination Accessibility

**6.7% - 20% VMT reduction due to decrease in distance to major job center or downtown**

Adequate

Reduction in VMT due to increased regional accessibility (jobs gravity). Locating new development in areas with good access to destinations reduces VMT by reducing trip lengths and making walking, biking, and transit trips more feasible. Destination accessibility is measured in terms of the number of jobs (or other attractions) reachable within a given travel time, which tends to be highest at central locations and lowest at peripheral ones.

0.5% - 12%

**Primary sources:**


**Secondary sources:**
### Comparison of CAPCOA Strategies Versus New Research Since 2010

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<th>CAPCOA Reduction</th>
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</table>
| Land Use/ Location | 3.1.5 | LUT-5 Increase Transit Accessibility | 0.5%-24.6% reduce in VMT due to locating a project near high-quality transit | Adequate | 1] VMT reduction when transit station is provided within ½ mile of development (compared to VMT for sites located outside ½ mile radius of transit). Locating high density development within ½ mile of transit will facilitate the use of transit by people traveling to or from the Project site. The use of transit results in a mode shift and therefore reduced VMT. | 0%-5.8% | 1] Lund, H. et al. (2004). Travel Characteristics of Transit-Oriented Development in California. Oakland, CA. Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans.  

Land Use/ Location | 3.1.6 | LUT-6 Integrate Affordable and Below Market Rate Housing | 0.04%-1.20% reduction in VMT for making up to 30% of housing units BMR | Weak - Should only be used where supported by local data on affordable housing trip generation. | Observed trip generation indicates substantial local and regional variation in trip making behavior at affordable housing sites. Recommend use of ITE rates or local data for senior housing. | N/A | "Draft Memorandum: Infill and Complete Streets Study, Task 2.1: Local Trip Generation Study." Measuring the MIlos: Developing new metrics for vehicle travel in LA. City of Los Angeles, April 19, 2017. |

Neighborhood Site Enhancements | 3.2.1 | SDT-1 Provide Pedestrian Network Improvements | 0%-2% reduction in VMT for creating a connected pedestrian network within the development and connecting to nearby destinations | Adequate | VMT reduction due to provision of complete pedestrian networks. Only applies if located in an area that may be prone to having a less robust sidewalk network. | 0.5%-5.7% | Handy, S. et al. (2014). Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from https://www.arb.ca.gov/cc/sb375/policies/policies.htm |
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<tbody>
<tr>
<td>Neighborhood Site Enhancements</td>
<td>3.2.2</td>
<td>SDT-2 Provide Traffic Calming Measures</td>
<td>0.25%-1%</td>
<td>VMT reduction due to traffic calming on streets within and around the development</td>
<td>Adequate</td>
<td>Reduction in VMT due to expansion of bike networks in urban areas. Strategy only applies to bicycle facilities that provide a dedicated lane for bicyclists or a completely separated right-of-way for bicycles and pedestrians. Project-level definition: Enhance bicycle network citywide (or at similar scale), such that a building entrance or bicycle parking is within 300 yards walking or bicycling distance from a bicycle network that connects to at least one of the following: at least 10 diverse uses; a school or employment center, if the project total floor area is 50% or more residential; or a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal. All destinations must be 3-mile bicycling distance from project site. Include educational campaigns to encourage bicycling.</td>
<td>0%-1.7%</td>
</tr>
<tr>
<td>Neighborhood Site Enhancements</td>
<td>3.4.9</td>
<td>TRT-9 Implement Car-Sharing Program</td>
<td>0.4% - 0.7%</td>
<td>VMT reduction due to lower vehicle ownership rates and general shift to non-driving modes</td>
<td>Adequate</td>
<td>Vehicle trip reduction due to car-sharing programs; reduction assumes 1%-5% penetration rate. Implementing car-sharing programs allows people to have on-demand access to a shared fleet of vehicles on an as-needed basis, as a supplement to trips made by non-SOV modes. Transit station-based programs focus on providing the “last-mile” solution and link transit with commuters’ final destinations. Residential-based programs work to substitute entire household-based trips. Employer-based programs provide a means for business/day trips for alternative mode commuters and provide a guaranteed ride home option. The reduction shown here assumes a 1%-5% penetration rate.</td>
<td>0.3%-1.6%</td>
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<tbody>
<tr>
<td>Parking Pricing</td>
<td>3.3.1</td>
<td>PDT-1 Limit Parking Supply</td>
<td>5%-12.5% VMT reduction in response to reduced parking supply vs. ITE parking generation rate</td>
<td>Weak - not recommended. Fehr &amp; Peers has developed new estimates for residential land use only that may be used.</td>
<td>CAPCOA reduction range derived from estimate of reduced vehicle ownership, not supported by observed trip or VMT reductions. Evidence is available for mode shift due to presence/absence of parking in high-transit urban areas; additional investigation ongoing.</td>
<td>Higher</td>
<td>Fehr &amp; Peers estimated a linear regression formula based on observed data from multiple locations. Resulting equation produces maximum VMT reductions for residential land use only of 10% in suburban locations and 50% in urban locations based on parking supply percentage reductions.</td>
</tr>
<tr>
<td>Parking Pricing</td>
<td>3.3.2</td>
<td>PDT-2 Unbundle Parking Costs from Property Cost</td>
<td>2.6% -13% VMT reduction due to decreased vehicle ownership rates</td>
<td>Adequate - conditional on the agency not requiring parking minimums and pricing/managing on-street parking (i.e., residential parking permit districts, etc.).</td>
<td>Reduction in VMT: primarily for residential uses, based on range of elasticities for vehicle ownership in response to increased residential parking fees. Does not account for self-selection. Only applies if the city does not require parking minimums and if on-street parking is priced and managed (i.e., residential parking permit districts).</td>
<td>Adequate</td>
<td>Victoria Transport Policy Institute (2009). Parking Requirement Impacts on Housing Affordability. Retrieved March 2010 from: <a href="http://www.vtpi.org/park-hou.pdf">http://www.vtpi.org/park-hou.pdf</a>.</td>
</tr>
<tr>
<td>Parking Pricing</td>
<td>3.3.3</td>
<td>PDT-3 Implement Market Price Public Parking</td>
<td>2.8%-5.5% VMT reduction due to “park once” behavior and disincentive to driving</td>
<td>Adequate</td>
<td>Implement a pricing strategy for parking by pricing all central business district/employment center/street center on-street parking. It will be priced to encourage park once behavior. The benefit of this measure above that of paid parking at the project only is that it detours parking spillover from project supplied parking to other public parking nearby, which underminds the vehicle miles traveled (VMT) benefits of project pricing. It may also generate sufficient area-wide mode shifts to justify increased transit service to the area. VMT reduction applies to VMT from visitor/customer trips only. Reductions higher than top end of range from CAPCOA report apply only in conditions with highly constrained on-street parking supply and lack of comparably-priced off-street parking.</td>
<td>Adequate</td>
<td>Clinch, J.P. and Kelly, J.A. (2000). Temporal Variance Of Revealed Preference On-Street Parking Price Elasticity. Dublin: Department of Environmental Studies, University College Dublin. Retrieved from: <a href="http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf">http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf</a>. Cited in Victoria Transport Policy Institute (2017). Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior. Retrieved from: <a href="http://www.vtpi.org/btech101.htm">http://www.vtpi.org/btech101.htm</a></td>
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<tr>
<td></td>
<td>3.5.1</td>
<td>TST-1 Provide a Bus Rapid Transit System</td>
<td>Adequate</td>
<td>No new information identified. Same N/A</td>
<td>Same</td>
<td>N/A</td>
</tr>
<tr>
<td>Commute Trip Reduction</td>
<td>3.4.1</td>
<td>TRT-1 Implement CTR Program - Voluntary</td>
<td>Adequate - Effectiveness is building/tenant specific. Do not use with ‘TRT-2 Implement CTR Program - Required Implementation/Monitoring’ or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.</td>
<td>Reduction in vehicle trips in response to employer-led TDM programs. The CTR program should include all of the following to apply the effectiveness reported by the literature: 1) Carpooling encouragement 2) Ride-matching assistance 3) Preferential carpool parking 4) Flexible work schedules for carpools 5) Half time transportation coordinator 6) Vanpool assistance 7) Bicycle end-trip facilities (parking, showers and lockers)</td>
<td>1.0%-6.0%</td>
<td>Boarnet, M. et al. (2014). Impacts of Employee-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: <a href="https://arb.ca.gov/cc/sb375/policies/policies.htm">https://arb.ca.gov/cc/sb375/policies/policies.htm</a></td>
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<tr>
<td>Commute Trip Reduction</td>
<td>3.4.6</td>
<td>TRT-6 Encourage Telecommuting and Alternative Work Schedules</td>
<td>0.07%-5.5% commute VMT reduction due to reduced commute trips</td>
<td>Adequate - Effectiveness is building/tenant specific.</td>
<td>VMT reduction due to adoption of telecommuting. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks.</td>
<td>0.2%-4.3%</td>
<td>Handy, S. et al. (2012), Policy Brief on the Impacts of Telecommuting Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: <a href="https://www.arb.ca.gov/cc/cb375/policies/telecommuting/telecommuting_brief120313.pdf">https://www.arb.ca.gov/cc/cb375/policies/telecommuting/telecommuting_brief120313.pdf</a></td>
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<tr>
<td>Commute Trip Reduction</td>
<td>3.4.3</td>
<td>TRT-3 Provide Ride-Sharing Programs</td>
<td>7%-15% commute VMT reduction due to employer ride share coordination and facilities</td>
<td>Adequate - Effectiveness is building/tenant specific. Do not use with &quot;TRT-1 Implement CTR Program - Voluntary&quot; or &quot;TRT-2 Implement CTR Program - Required Implementation/Monitoring.&quot;</td>
<td>Commute vehicle trips reduction due to employer ride sharing programs. Promote ride-sharing programs through a multi-faceted approach such as: - Designating a certain percentage of parking spaces for ride-sharing vehicles - Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles - Providing an app or website for coordinating rides</td>
<td>2.5%-8.3%</td>
<td>Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: <a href="http://vtpi.org/tdm/tdm14.htm">http://vtpi.org/tdm/tdm14.htm</a></td>
</tr>
<tr>
<td>Commute Trip Reduction</td>
<td>3.4.13</td>
<td>TRT-13 Implement School Bus Program</td>
<td>39%-61% reduction in school VMT due to school bus service implementation</td>
<td>Adequate - School VMT only. VMT reduction for school trips based on data beyond a single school district. School district boundaries are also a factor to consider. VMT reduction does not appear to be a factor that was considered in a select review of CA boundaries. VMT reductions apply to school trip VMT only.</td>
<td>5%-30%</td>
<td>Wilson, E., et al. (2007). The implications of school choice on travel behavior and environmental emissions. Transportation Research Part D: Transport and Environment 12(2007), 506-518.</td>
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<td>Not Applicable - not a CAPCOA strategy</td>
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<td>Bikeshare car trip substitution rate of 7-19% based on data from Washington DC, and Minneapolis/St. Paul. Annual VMT reduction of 151,000 and 57,000, respectively. Includes VMT for rebalancing and maintenance. VMT reduction of 0.023 miles per day per member estimated for Bay Area bikeshare, utilizing Minneapolis/St. Paul data from study above.</td>
<td>57,000-151,000 annual VMT reduction, based on two large US cities. VMT reduction of 0.023 miles per day per member based on one large US city estimate.</td>
<td>Fishman, E., Washington, S., &amp; Haworth, N. (2014). Bike share’s impact on car use: Evidence from the United States, Great Britain, and Australia. Transportation Research Part D: Transport and Environment, 31, 15-20.</td>
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Appendix H: VMT Mitigation Through Banks and Exchanges: Understanding New Mitigation Approaches
VMT Mitigation Through Fees, Banks, & Exchanges

UNDERSTANDING NEW MITIGATION APPROACHES

A WHITE PAPER PREPARED BY

Fehr & Peers
VMT MITIGATION THROUGH FEES, BANKS, AND EXCHANGES

Understanding New Mitigation Approaches

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

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

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

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

- CEQA Guidelines Section 15364
Without feasible mitigation, significant VMT impacts would be significant and unavoidable (SAU). Under these circumstances a project must prepare an environmental impact report (EIR) adding extra time and cost to environmental review compared to a negative declaration (ND). Program-based approaches may be able to overcome the limitation of project-site only mitigation. Three specific concepts as described below have been identified for the purposes of this white paper.

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

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

- **VMT Mitigation Bank** – A mitigation bank attempts to create a monetary value for VMT reduction such that a developer could purchase VMT reduction credits. The money exchanged for credits could be applied to local, regional, or state level VMT reduction projects or actions. Like all VMT mitigation, substantial evidence would be necessary that the projects covered by the bank would achieve expected VMT reductions and some form of monitoring may be required. This is more complicated than a simple exchange and would require more time and effort to set up and implement. The verification of how much VMT reduction is associated with each dollar or credit would be one of the more difficult parts of the program.
With both exchanges and banks, another important test is that the VMT reduction would not have occurred otherwise such that mitigation program creates ‘additionality’. This means that additional VMT reduction will occur above and beyond what would have occurred without the program. A commonly accepted definition of ‘additionality’ has not yet been developed. One possible test of additionality is that the mitigation project is not included in the regional transportation plan (RTP). The RTP is a financially constrained plan so projects not included in the plan would not likely have been implemented within the typical cumulative timeframe.

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

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

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

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Pros</th>
<th>Cons</th>
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</table>
| Impact Fee Program | • Common and accepted practice  
• Accepted for CEQA mitigation  
• Adds certainty to development costs  
• Allows for regional scale mitigation projects  
• Increases potential VMT reduction compared to project site mitigation only | • Time consuming and expensive to develop and maintain  
• Requires strong nexus  
• Increases mitigation costs for developers because it increases feasible mitigation options  
• Limited to jurisdictional boundary unless a regional authority is created  
• Uncertainty about feasibility and strength of nexus relationship between VMT and pedestrian, bicycle, and transit projects (especially in suburban/rural jurisdictions) |
| Mitigation Exchange| • Limited complexity  
• Reduced nexus obligation  
• Expands mitigation to include costs for programs, operations, and maintenance  
• Allows for regional scale mitigation projects  
• Allows for mitigation projects to be in other jurisdictions  
• Increases potential VMT reduction compared to project site mitigation only | • Requires ‘additionality’  
• Potential for mismatch between mitigation need and mitigation projects  
• Increases mitigation costs for developers because it increases feasible mitigation options  
• Unknown timeframe for mitigation life  
• Effectiveness depends on scale of the program |
| Mitigation Bank    | • Adds certainty to development costs  
• Allows for regional scale projects  
• Allows for mitigation projects to be in other jurisdictions  
• Allows regional or state transfers | • Requires ‘additionality’  
• Time consuming and expensive to develop and maintain  
• Requires strong nexus  
• Political difficulty distributing mitigation dollars/projects |
Table 1 – VMT Mitigation Program Type Comparison

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<th>Program Type</th>
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<th>Cons</th>
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<td></td>
<td>• Expands mitigation options to include costs for programs, operations, and maintenance</td>
<td>• Increases mitigation costs for developers because it increases feasible mitigation options</td>
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<tr>
<td></td>
<td>• Increases potential VMT reduction compared to project site mitigation only</td>
<td>• Unknown timeframe for mitigation life</td>
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<tr>
<td></td>
<td></td>
<td>• Effectiveness depends on scale of the program</td>
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To better understand potential program differences, Table 2 contains a comparison of the VMT mitigation projects or actions that each program type could fund or implement. The information for an impact fee program is more certain than for exchanges or banks. Fee programs have been used in practice for decades and have been vetted through court decisions. While banks and exchanges do exist for other environmental mitigation purposes such as wetlands preservation and habitat conservation, these applications have largely focused on protecting fixed land amounts versus reducing a metric that fluctuates over time and may vary in value depending on economic conditions.

Table 2 – VMT Mitigation Projects and Actions Comparison

<table>
<thead>
<tr>
<th>Program Structure</th>
<th>Project Types that Reduce VMT</th>
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<tbody>
<tr>
<td>Impact Fee Program</td>
<td>• Pedestrian network expansion</td>
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<td>• Bicycle/Scooter network expansion (includes bike/scooter share stations)</td>
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<td></td>
<td>• Transit vehicles or facilities associated with service expansion</td>
</tr>
<tr>
<td></td>
<td>• Roadway gap closures that reduce trip lengths (bridges)</td>
</tr>
<tr>
<td>Mitigation Exchange</td>
<td>• All impact fee program project types</td>
</tr>
<tr>
<td></td>
<td>• Private or institutional projects that reduce VMT</td>
</tr>
<tr>
<td></td>
<td>• Transit service improvements and transit pass subsidies</td>
</tr>
<tr>
<td>Mitigation Bank</td>
<td>• All impact fee program project types</td>
</tr>
<tr>
<td></td>
<td>• All mitigation exchange project types</td>
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<td></td>
<td>• VMT reduction strategies associated with travel behavior changes</td>
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IMPLEMENTATION STEPS

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

<table>
<thead>
<tr>
<th>Table 3 – Potential VMT Mitigation Exchange/Bank Legal Requirements</th>
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<tr>
<td><strong>Program Type/Legal Requirements</strong></td>
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<td>Transportation Impact Fee Program</td>
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1. Mitigation Fee Act – Intended to create a program that allows individual development projects to pay for all or portion of the cost to implement public facilities necessary to support the project. Public facilities are generally limited to capital projects. The nexus study for the program must demonstrate how there is a reasonable relationship between the following.

- How there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
- How there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.
- How there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

The fees may not be applied to existing deficiencies or the maintenance and operation of an improvement. As such, clear standards should exist about the physical and operational performance expectations for each model of travel included in the program.
<table>
<thead>
<tr>
<th>Program Type/Legal Requirements</th>
<th>Statutory Reference</th>
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<tbody>
<tr>
<td>2. Constitutional – Court decisions have placed limits on what level of mitigation can be expected of land use development projects. The limits largely require a nexus between the mitigation and a legitimate government interest plus a rough proportionality between the mitigation and the adverse impact caused by the project.</td>
<td>• Nollan v. California Coastal Commission, 483 U.S. 825 (1987)</td>
</tr>
<tr>
<td></td>
<td>• Dolan v. City of Tigard, 512 U.S. 374 (1994)</td>
</tr>
<tr>
<td>3. CEQA – For mitigation to be imposed, a significant impact must occur. Impacts stem from changes to the baseline environment caused by the project. The significance of those impacts is determined by the lead agencies choice of thresholds. This limits mitigation to increment of VMT change that occurs above the threshold.</td>
<td>• CEQA Statute (CA Public Resources Code 21000-21189)</td>
</tr>
<tr>
<td></td>
<td>• CEQA Guidelines (CA Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387)</td>
</tr>
</tbody>
</table>

### VMT Mitigation Exchange or Bank

<table>
<thead>
<tr>
<th></th>
<th>Fish &amp; Game Code §1852(c)(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An explanation of the VMT mitigation purpose of and need for the bank or exchange.</td>
<td></td>
</tr>
<tr>
<td>2. The geographic area covered by the bank or exchange and rationale for the selection of the area, together with a description of the existing transportation and development dynamics that provide relevant context for the development of the bank or exchange.</td>
<td>§1852(c)(2)</td>
</tr>
<tr>
<td>3. The public transit and VMT reduction opportunities currently located within the bank or exchange area.</td>
<td>§1852(c)(3)</td>
</tr>
<tr>
<td>4. Important residential and commercial communities and transportation resources within the bank or exchange area, and an explanation of the criteria, data, and methods used to identify those important communities and resources.</td>
<td>§1852(c)(4)</td>
</tr>
<tr>
<td>5. A summary of historic, current, and projected future transportation stressors and pressures in the bank or exchange area, including economic, population growth and development trends.</td>
<td>§1852(c)(5-6)</td>
</tr>
<tr>
<td>6. Provisions ensuring that the bank or exchange will comply with all applicable state and local legal and other requirements and does not preempt the authority of local agencies to implement infrastructure and urban development in local general plans.</td>
<td>§1852(c)(7)</td>
</tr>
<tr>
<td>7. VMT mitigation goals and measurable objectives for regional transportation resources and important mitigation elements identified in the plan that address or respond to the identified stressors and pressures on transportation within the bank or exchange area.</td>
<td>§1852(c)(8)</td>
</tr>
</tbody>
</table>
Table 3 – Potential VMT Mitigation Exchange/Bank Legal Requirements

<table>
<thead>
<tr>
<th>Program Type/Legal Requirements</th>
<th>Statutory Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. VMT mitigation projects, including a description of specific projects that, if implemented, could achieve the mitigation goals and objectives, and a description of how the mitigation projects were prioritized and selected in relation to the mitigation goals and objectives.</td>
<td>• §1852(c)(9)</td>
</tr>
<tr>
<td>9. Provisions ensuring that the bank or exchange plan is consistent with and complements any local, regional or federal transportation or congestion management plan that overlaps with the bank or exchange area, a summary of any such plans, and an explanation of such consistency.</td>
<td>• §1852(c)(10-11)</td>
</tr>
</tbody>
</table>

Sources:
Implementing SB 743 An Analysis of Vehicles Miles Traveled Banking and Exchange Frameworks, October 2018, Institute of Transportation Studies, U.C. Berkeley.
http://leginfo.ca.gov/  http://ccr.oal.ca.gov/

A review of these potential legal requirements suggests that the creation of an exchange or a bank may not be less rigorous than that of a conventional transportation impact fee program. These legal requirements combined with the need to demonstrate additionality and provide verification could create implementation costs beyond those of a conventional transportation impact fee program. To explore this issue further, annotated flow charts were developed for each program concept. These flow charts are presented on the following pages and allow a reviewer to quickly surmise the differences and similarities associated with creating, operating, and maintaining these programs.
Mitigating VMT Impacts Under SB 743

VMT Bank

Implementation

Step 1
Determine Scale/Scope

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

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

Step 2
Determine Sponsor

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

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

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

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

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

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

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

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

* Caltrans - local office
* ARB
* CalEPA

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

* Equity
* Timeliness of Implementation
* Cost

Mitigation options can include:

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

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

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

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

Step 3
Formally Establish Bank & Review Team

Step 4
Determine & Prioritize Mitigation Options

Step 5
Administer Bank

Considerations

Procedural Flowchart

Implementation

Decision

Analytical process or procedural outcome

Program Scale

Maintaining the Bank in-house could:

Increase agency control

Potentially generate revenue

Allowing a third party to maintain the Bank can:

Decrease an agency’s administrative costs

Decrease agency control

Decrease burden on agency staff

Complete Legal Formation of Bank

Develop Review Team

Determine & Select Mitigation Options

Administer Bank and Complete Mitigation Agreements with Lead Agencies

STATE

LOCAL

REGIONAL

PUBLIC

PRIVATE

STATE

LOCAL

REGIONAL

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PRIVATE

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Mitigating VMT Impacts Under SB 743

**VMT Exchange**

### Implementation

**Step 1**
Determine Scale/Scope

To create a regional program requires all participating agencies to adopt the program. Programs with larger scopes can:
- Decrease administrative costs
- Decrease local authority
- Increase efficiency and effectiveness of the program

**Step 2**
Determine Sponsor

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

**Step 3**
Determine & Propose Mitigation Options

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

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

**Step 4**
Develop Review Team

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

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

**Step 5**
Administer Exchange

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

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

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

---

### Considerations

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

### Procedural Flowchart

**Program Scale**

- **Regional**
  - **Public**
    - Determine Mitigation Options
    - Develop Approved Process for Sponsor and Lead Agency
  - **Private**
    - Determine Mitigation Options
    - Develop Approved Process for Sponsor and Lead Agency

- **Local**
  - **Public**
    - Develop Review Team
    - Verify Effectiveness of Mitigation Options
    - Administer Exchange and Complete Mitigation Agreements with Lead Agencies
  - **Private**
    - Develop Review Team
    - Verify Effectiveness of Mitigation Options
    - Administer Exchange and Complete Mitigation Agreements with Lead Agencies

**Decision**

- Maintaining the Exchange internally could:
  - Increase the agency’s control over the program
  - Potentially generate revenue

- Allowing a third party to maintain the Exchange can:
  - Decrease administrative costs
  - Decrease agency control
  - Decrease burden on agency staff

---

**Allowing a third party to maintain the Exchange can**:
- Decrease administrative costs
- Decrease agency control
- Decrease burden on agency staff
Mitigating VMT Impacts Under SB 743

VMT Impact Fee

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Considerations</th>
<th>Procedural Flowchart</th>
</tr>
</thead>
</table>
| Step 1 Determine Scale/Scope | To create a regional program requires all participating agencies to adopt the program. Programs with larger scopes:  
* Decrease administrative costs  
* Decrease local authority  
* Increase efficiency and effectiveness of the program | Program Scale  
Determine Nexus (VMT) Approaches  
Determine Mitigation Options for CIP  
Identify CIP Priorities  
Prepare Nexus Study  
Prepare & Adopt Fee Ordinance  
Complete CEQA Review  
Administer the Fee Program  
Perform Cost Updates  
Monitor Fee Use (5-Year Check)  
Update Modeling & Analysis as Needed |
| Step 2 Determine Nexus (VMT) | An agency must determine its VMT reduction goal before it can show the relationship between new development and that goal. | |
| Step 3 Determine & Propose Mitigation Options | The CIP develops a list of capital improvement projects necessary to reduce VMT consistent with its desired goal. The agency should prioritize the projects so they are constructed in a logical order.  
The prioritization process should consider:  
* Equity  
* Timeliness  
* Cost  
* Modal Preference (Walking/Biking/Transit)  
* Stakeholder/Community Input | |
| Step 4 Prepare & Approve Nexus Study | Agencies must demonstrate that the projects in the fee program contribute to VMT reduction. The agency must also show that the fees are related and proportional to new development.  
Fees should take into account the delay in the time when fees are collected and when they are used. | |
| Step 5 Prepare & Adopt Fee Ordinance | For a fee to be regularly imposed, it must be adopted as an ordinance.  
The ordinance must include:  
* Reason for the fee  
* The relationship between the fee and new development  
* Methodology used in developing the fee  
* Projects to be included in the CIP | |
| Step 6 Complete CEQA Review for the Program | California courts have ruled that in order for a fee program to serve as acceptable CEQA mitigation, the program itself must first be reviewed in an EIR. | |
| Step 7 Administer the Program | For Regional Impact Fee Programs ensure that participating agencies have adopted the program such that payment of fees is considered a feasible mitigation measure. | |
PROGRAM EXAMPLES

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

City of Los Angeles Westside Mobility Plan Transportation Impact Fee Program

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

WRCOG Transportation Uniform Mitigation Fee (TUMF) Program

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

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

WRCOG serves as the Program Administrator and has three main responsibilities. First, WRCOG leads the development of regular AB 1600 compliant Nexus Studies. These Studies identify needed the transportation facilities to be funded by the fee, identify future growth projections, and set the resulting
fee, which is then adopted by WRCOG’s Executive Committee. The transportation projects included in the Nexus Study are identified through a collaborative process in which jurisdictions submit projects for consideration, which are then subject to an analysis process to verify that they meet applicable criteria. These two-step process ensures that the projects included in the Nexus Study reflect both local input and regional need. A similar process could be used to create a VMT reduction nexus and to select VMT reducing projects for either a separate VMT impact fee program or a modified TUMF that includes projects to achieve LOS and VMT reduction goals.

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

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

**Miles**

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

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

The purpose of rewarding green trips and the special challenges is to influence user behavior to reduce vehicle trips and VMT. With some additional accounting of user travel behavior before and after using the app, enough substantial evidence could be created to provide the VMT reduction verification described above and noted in the flow charts. The program already has administrative functions developed and
established relationships between the partner agencies. Some of the unknowns at this time are listed below.

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

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

**Metro Transit Pass Subsidy**

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

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

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

IMPLEMENTATION RISKS

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

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


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

> In a strongly worded amicus brief recently submitted to the 4th District Court of Appeal in San Diego, Becerra argued that the county’s offset strategy would “perpetuate current sprawling development patterns, which will impede the ability of the region and state to reach their long-term climate objectives.”

> “Without significant [vehicle miles traveled] reductions across the state, California simply will not be able to achieve its [greenhouse gas] reduction targets,” the 33-page document said.
The state does not appear to support reducing GHG emissions from land use development without those reductions coming from fundamental local land use and transportation network changes. The risk is that lower density suburban and rural parts of the state would continue their sprawling patterns leading to more VMT and emissions. If the state maintains this position, it could also be used to argue against the creation of VMT mitigation exchanges and banks that attempt to offset VMT increases. To minimize this risk, the mitigation options offered by exchanges and banks could be applied only after project site mitigation has been exhausted and should attempt to offer additional mitigation within the same area or community.

**GOVERNANCE**

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

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

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

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

  This option also allows for new VMT reducing projects to be added to the VMT mitigation CIP. The more projects that are added, the greater the potential VMT reduction, but also the greater the impact fees. Under this option, the TUMF would continue to serve a mitigation program for land use development projects. No mitigation would be available through the program for transportation infrastructure projects that generate new VMT.
- **New VMT Impact Fee Program** – This option involves creating a new VMT impact fee program focused solely on achieving VMT reduction through the CIP projects. The CIP would largely consist of active transportation and transit projects where sufficient evidence exists to demonstrate a VMT reduction nexus. The program would also be targeted exclusively for land use development project mitigation.

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

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

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

**How are decisions made?**
Any decision related to the implementation of any option identified above would ultimately be made by the Executive Committee after discussions, input, and voting has occurred at the various policy committees. On-going operation of the program would occur at the Executive Director, Transportation & Planning Director, and Public Works Committee (PWC) levels. Decisions and informational items are first brought to the Public Works and or Planning Directors Committee (PDC). Recommendations are then brought forth to the TAC. Following this would be the Administration & Finance Committee (AFC) who
provide budget and finance overview, which is comprised of a smaller group of elected officials who are also members of the Executive Committee. The final decision recommendations are lastly brought to the Executive Committee who make the final determination.

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

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

The table below summarizes the governance expectations above.

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

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

- TAC
- AFC
- Executive Committee
Prior to implementing any new Program, WRCOG would need to develop a concrete proposal for recommendation. Given WRCOG’s experience, this proposal should address each item below.

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

WRCOG Staff conducted a survey of its member agencies late in 2019 and early in 2020 to gauge their interest in either a VMT mitigation fee or exchange. The survey results are provided below. Based on the survey responses, it appears that a majority of our local agencies prefer a fee-based approach, though there is support for an exchange as well.
Based on that positive feedback, there appears to be merit in advancing a mitigation program. The next steps would generally focus on increased socialization of this concept and conceptual program development. Specific tasks WRCOG should undertake would include but not be limited to the following items.

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