BCAG SB 743 Implementation

JUNE 2021

BCAG
BUTTE COUNTY ASSOCIATION OF GOVERNMENTS

FEHR PEERS

Acknowledgements

This study was sponsored by the Butte County Association of Governments (BCAG) to help its member agencies advance their implementation of Senate Bill (SB) 743 changes to the California Environmental Quality Act (CEQA).

The information, analysis, and recommendations are not binding on any agencies as they have discretion to select their preferred methodology, thresholds, and mitigation related to CEQA compliance.

Photo Chico Paper Co Exterior, www.downtownchico.com
Cover photo: Highway 70 between Ophir and Palermo Roads south of Oroville, Oroville Mercury Register, www.orovillemr.com, July 2019.

Photo: Butte County Pictures & Information Facebook, Jeremy Dunn, May 2021

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Executive Summary

This executive summary is intended to provide a brief introduction of the BCAG 743 Implementation Study and summarizes the work and findings of the technical working papers completed to date. The working papers are included as individual chapters following this Executive Summary.

INTRODUCTION

Senate Bill (SB) 743 changes how transportation impacts are measured under the California Environmental Quality Act (CEQA) from using vehicle level of service (LOS) to using vehicle miles traveled (VMT). This change is intended to capture the impacts of driving on the environment compared to the impact on drivers. Concerns about the impact of projects on drivers through the use of LOS or other delay metrics may still occur as part of land use entitlement reviews but LOS will no longer be allowed as a basis for transportation impacts under CEQA. To implement SB 743, lead agencies will need to determine appropriate VMT methodologies, thresholds, and feasible mitigation measures.

The purpose of this project is to help BCAG member agencies understand the specific questions that need to be addressed when making these determinations and to provide research, analysis, and other evidence to support their final SB 743 implementation decisions. BCAG chose to lead this effort to help reduce the SB 743 implementation costs that would have otherwise been incurred by each member agency pursuing independent implementation efforts. BCAG provides this documentation as a resource for its member agencies and does not make any specific recommendations regarding SB 743 implementation. Each member agency will be required to make its own SB 743 implementation decisions and may rely on this information to the extent it is relevant.

The project team prepared seven working papers for this project covering the following key issues that each jurisdiction must address when developing VMT impact analysis procedures.

- Methodology – what methodology should be used to forecast 'projected generated VMT' and the 'project's effect on VMT' under baseline and cumulative conditions and how does the selection of a threshold influence the methodology decision?
- Thresholds – what threshold options are available and what substantial evidence exists to support the selection of a specific VMT threshold?
- Mitigation – what would constitute feasible mitigation measures for a VMT impact given the land use and transportation context of the BCAG region?

Below is a summary of the main working paper findings or suggestions. While the overall study is focused on the analysis of land use projects, the working papers also cover transportation project impact analysis where appropriate

METHODOLOGY

A modified version 1.1-3.17.21 of the BCAG RTP/SCS travel demand model was developed for SB 743 applications and is available to member agencies to produce the following suggested VMT metrics.

- Home-based VMT per resident (used to evaluate residential land use projects)
- Home-based work VMT per workers (used to evaluate office or work-related land use projects)
- Total VMT (used to evaluate emissions and can be processed by speed bin)
- Total VMT per service population (optional metric for evaluating large area land use plans such as general plans and specific plans)

The modified version of the model has a 2020 forecast year suggested as the starting point for baseline conditions. Linear interpolation can be used to estimate other baseline years beyond 2020 using the model's 2040 horizon year.

For purposes of VMT impact screening, the VMT per resident, worker, and service population metrics have been calculated for 2020 and 2040 conditions and integrated into a web application tool that is available to member agencies. The tool allows individual land use projects to be quickly assessed for potential VMT impacts using a variety of threshold values presented in the study.

THRESHOLDS

Potential VMT thresholds were assessed within the context of the objectives of SB 743, legal opinions related to the legislation, substantial evidence, as well as the guidance contained in the CEQA Guidelines and the *Technical Advisory on Evaluating Transportation Impacts in CEQA*, California Governor's Office of Planning and Research (OPR), December 2018 (OPR Technical Advisory). Three specific threshold options were introduced through the study and information was also provided about other options that lead agencies could investigate.

To help lead agencies understand how state threshold recommendations could affect project outcomes, four case studies were conducted. The case studies were based on previously approved projects to allow comparisons to previous transportation impact conclusions. Key findings revealed the potential for smaller projects to be screened out of performing VMT impact analysis while larger projects, or projects located outside the larger cities, would likely result in significant VMT impacts based on state thresholds.

MITIGATION

On-site and off-site VMT mitigation actions were evaluated within the land use and transportation context of Butte County. These actions considered both the built environment (e.g., land use density, diversity, etc.) and transportation demand management (TDM) strategies. A limited number of mitigation actions were identified as being applicable in Butte County given the land use context. To expand mitigation actions and their effectiveness, information was provided about developing a VMT mitigation program such as an impact fee program.

PUTTING IT ALL TOGETHER

The flowchart on the next page explains how lead agencies can apply the information from this study into a standardized transportation impact review process. Annotations are included with the flowchart to help explain each key step.

MORE INFORMATION

More information about SB 743 implementation can be found at the following websites.

OPR SB 743 Resources - https://opr.ca.gov/ceqa/updates/sb-743/

Caltrans SB 743 Resources – https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743

Fehr & Peers SB 743 Resources - http://www.fehrandpeers.com/sb743/.

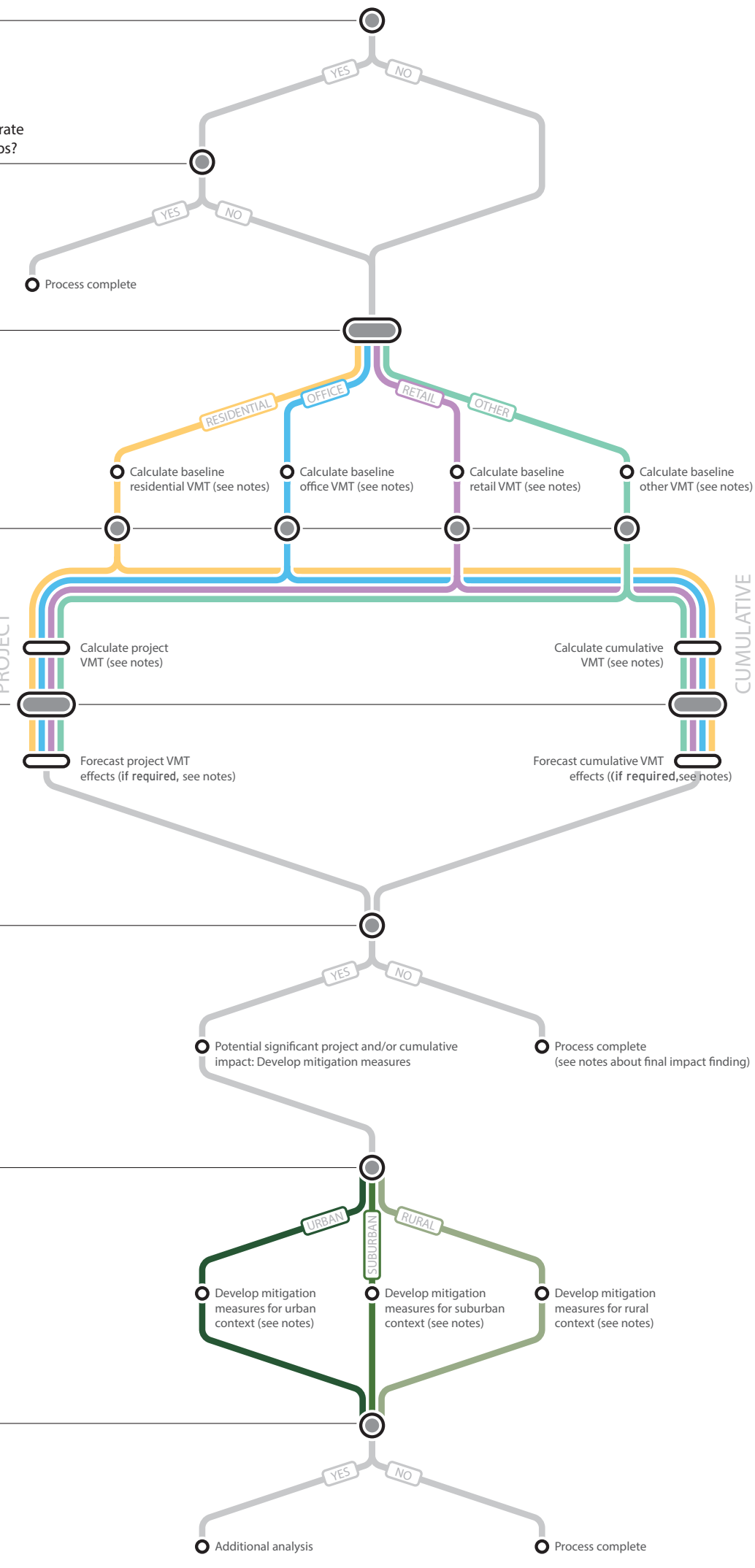
Navigating Land Use Projects Through SB 743

FEHR & PEERS

Steps

Project Questions

Procedural Flowchart



SB 743 Procedural Notes: Land Use (1/2)

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Steps	Analysis Procedures	Technical Notes
	Land Use Color Coding: Residential Office Retail Other	
Step 1 Screening	Use BCAG VMT Impact Screening tool to determine if project is located in a low VMT area. If "yes" to any screening questions on flowchart, process complete. If "no" to the first question, go to Step 2.	Lead agencies make final determinations about general plan and RTP/SCS consistency, but BCAG may provide guidance or technical assistance. Final impact determination should consider other available evidence as required by CEQA Guidelines Section 15064(b)(2) such as the reports noted in Step 5 below.
Step 2 Establishing Baseline VMT Levels	**Residential** If project is located in an incorporated city, use the baseline year city-wide or region-wide average home-based VMT per resident from the BCAG VMT Impact Screening Tool. For unincorporated areas, use the region-wide average value. **Office** Use the baseline year region-wide average home-based work VMT per worker from the BCAG VMT Impact Screening Tool. **Retail** Calculate total VMT of the market area served by the proposed retail project. **Other** Work-related land uses may use the same metric and approach as the office land use if the project is located in existing urbanized area. Land uses that attract substantial visitors or shoppers may use the same metric and approach as retail.	Baseline should be tied to the date of the NOP release. The BCAG VMT Impact Screening Tool allows the user to specify the specific baseline year and interpolates between the BCAG RTP/SCS Model's 2020 and 2040 forecast years.
Step 3 Establishing VMT Threshold	**Project VMT Threshold** 85% of city-wide or region-wide VMT metric from Step 2 or the adopted threshold of the lead agency. No increase in VMT from Step 2. Lead agency discretion. Should consider SB743 objectives to encourage infill, promote active transportation, and reduce GHGs. Thresholds recommended for office or retail may also be considered. **Cumulative VMT Threshold** Same as project threshold plus consistency with the general plan and RTP/SCS.	Lead agencies have discretion to establish their own significance thresholds per CEQA Guidelines Section 15064.7, but substantial evidence is required to support those thresholds. If they differ from the OPR recommendations, substantial evidence should also be provided to explain why.
Step 4 Forecasting Project VMT Effects	**Project Forecasting** The latest version of the BCAG RTP/SCS travel demand model may be used to analyze the project generated VMT and project effect on VMT under Baseline Plus Project conditions. When using an efficiency metric such as home-based VMT per resident, the baseline plus project results may be sufficient for assessing project and cumulative impacts if evidence demonstrates that long-term VMT per resident/worker are trending downward. Current evidence noted in Step 5 suggests that VMT per resident/worker is trending up. This evidence should be consulted when determining whether to include a separate cumulative model run and impact analysis. Check production/attraction balance to determine if the model accurately represents full trip generation of the project. Divide resulting VMT forecasts by the project's residents or workers to produce per capita VMT values for specific land use types. Resident and worker forecasts for the project should rely on the model input values for the project's traffic analysis zone (TAZ). **Cumulative Forecasting** Land use projects influence land supply for permitted and conditional uses. They do not change the regional control totals for cumulative population and employment growth. As such, VMT effects should be analyzed by changing the allocation of population and employment growth based on the land supply changes associated with the project. The cumulative no project model run should represent the adopted general plan or RTP/SCS conditions while the cumulative plus project condition should represent the reallocation of the population and employment growth attributable to the project.	Project level analysis may overstate the project's effect on VMT because it does not fully consider the project's influence on the VMT generation of surrounding land uses. Hence, cumulative analysis may be more meaningful for impact purposes.

SB743 Procedural Notes: Land Use (2/2)

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Steps	Analysis Procedures	Technical Notes
	Land Use Color Coding: Residential Office Retail Other	
Step 5 Identifying Significant Impacts	Identify significant impacts for all land uses and impact scenarios. A significant impact may occur if project's Step 4 VMT exceeds Step 3 threshold. A significant impact could also result from consideration of other substantial evidence such as information about VMT trends contained in the reports below. *2018 Progress Report, California's Sustainable Communities and Climate Protection Act*, California Air Resources Board, November 2018 *California Air Resources Board Improved Program Measurement Would Help California Work More Strategically to Meet Its Climate Change Goals*, Auditor of the State of California, February 2021	The two cited reports contain evidence that background VMT per capita has been increasing. Lead agencies should consider if these trends are also occurring in their jurisdiction, which could affect VMT impact conclusions.
Step 6 Developing Mitigation Measures	Urban For urban areas, the number of effective VMT reduction strategies includes a broad range of both on-site and off-site actions. VMT reduction potential exceeds the 15% reduction threshold for single use projects. Suburban/Rural For suburban/rural areas, the number of effective VMT reduction strategies includes on-site and off-site actions but will depend on the general density and intensity of the community, existing levels of transit service, and conduciveness for walking and bicycling. VMT reduction potential is not likely to achieve the 15% reduction threshold for single use projects. Area-wide TDM programs may be more effective but would require the lead agency to have already established the program to be feasible mitigation.	Mitigation can include project design changes related to the 7Ds or actions to reduce vehicle travel demand such as the TDM/pricing strategies contained in Quantifying Greenhouse Gas Mitigation Measures, CAPCOA, 2010. Use of TDM strategies has limitations for CEQA mitigation because their effectiveness is dependent on future building tenants. Lead agencies should consider whether this limitation would require on-going mitigation monitoring to verify VMT reduction performance of required strategies.
Step 7 Identifying Impacts of Mitigation	Mitigation actions can create other environmental impacts. Mitigation actions that require the expansion of existing facilities or services or the creation of new facilities or services may have an effect on the environment that should be evaluated as prescribed by CEQA Guidelines Section 15126.4(a)(1)(D).	

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Overview

The BCAG SB 743 Implementation Study is designed to help lead agencies in Butte County complete the decision-making process.

The Evolution of Transportation Impact Analysis

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. Further, parking impacts will not be considered significant impacts on the environment for select development projects within infill areas served by frequent transit service. According to the legislative intent contained in SB 743, these changes to current practice were necessary to, "*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.*"

IMPLEMENTATION

To implement this intent, SB 743 required the Governor's Office of Planning and Research (OPR) to update the CEQA Guidelines and establish, *"... criteria for determining the significance of transportation impacts of projects within transit priority areas."* The new criteria, *"… shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses."* Once the Secretary of the Natural Resources Agency certified the new guidelines, then *"…automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment…, except in locations specifically identified in the guidelines, if any."*

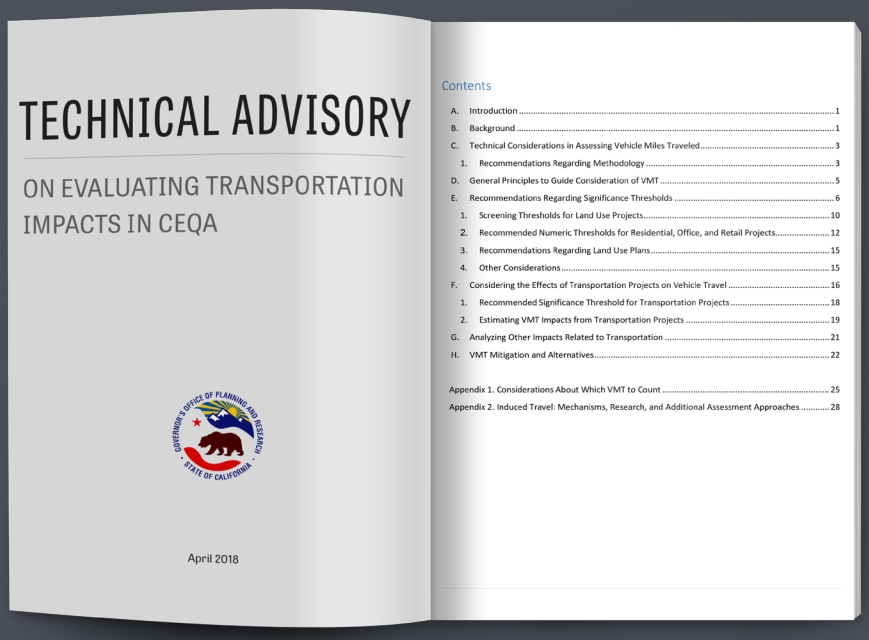
OPR and the Natural Resources Agency completed their responsibilities under SB 743 as of December 2018. They recommended vehicle miles of travel (VMT) as a replacement to vehicle LOS and made this replacement statewide effective July 1, 2020. The specific CEQA Guidelines changes (new Section 15064.3) and OPR technical guidance *(Technical Advisory on Evaluating Transportation Impacts in CEQA, OPR, December 2018)* are available from OPR at https://opr.ca.gov/ceqa/updates/sb-743/.

The OPR *Technical Advisory* includes specifications for VMT methodology and recommendations for significance thresholds and mitigation measures. As noted above, SB 743 requires impacts to transportation network performance to be viewed through a filter that promotes *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) and emissions so its selection is aligned with the objectives of SB 743.

Accessibility is an important planning objective in many communities but so is travel time or delay experienced by users. SB 743 does not prevent a city or county from continuing to analyze delay or LOS as part of other plans (e.g., the general plan), fee programs, on-going network monitoring, or entitlement review of projects but these metrics will no longer constitute the sole basis for CEQA impacts.

In response, many cities and counties are separating transportation impact analysis for land use projects into separate processes. One process is for entitlement review and making findings associated with the agency's general plan and other relevant development standards. Under this process, LOS is analyzed consistent with general plan expectations.

The other process is for environmental review compliance under CEQA. This process includes the new VMT impact analysis as well as the analysis of impacts to transit, active transportation, safety, and construction. Adding the new VMT impact analysis to this process requires lead agencies to make multiple decisions. The BCAG SB 743 Implementation Study is designed to help lead agencies in Butte County complete the decision-making process as outlined on the following page.



TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

OPR, DECEMBER 2018

The OPR Technical Advisory includes specifications for VMT methodology and recommendations for significance thresholds and mitigation measures.

LEAD AGENCY ACTIONS

To implement SB 743, lead agencies will need to answer the implementation questions listed below.

- What is the preferred methodology for estimating and forecasting VMT considering that this metric is a required input for air quality, energy, GHG, and now transportation impact analysis in CEQA?
- What are the significance thresholds for VMT impacts under 'baseline' and 'cumulative' conditions? Does the lead agency accept the OPR Technical Advisory recommendation that land use projects and plans within metropolitan planning organization (MPO) areas can achieve a 15 percent reduction in VMT per capita or per worker compared to existing conditions?
- Does the lead agency want to take advantage of VMT impact screening?
- If the lead agency wants to follow the OPR Technical Advisory recommendations, what travel forecasting model will be used to estimate baseline VMT for citywide or regional averages?
- How will the lead agency ensure that project-scale VMT analysis is consistent with the methodology used to estimate thresholds?
- Will VMT impact screening be allowed for residential and employment land uses based simply on location within a transit priority area (TPA) or low-VMT generating area? Will screening also be allowed for local-serving retail projects consisting of less than 50,000 square feet?
- What mitigation does the lead agency consider to be feasible for VMT impacts? If TDM is used, how will the lead agency verify its effectiveness over time since many TDM programs are building tenant dependent?

To help lead agencies answer these questions, the matrix in Attachment A presents each question along with associated options, limitations, and considerations. Lead agency decisions need to be based on substantial evidence and this matrix provides a framework for how to assess each question based on current information and technical practices.

An important aspect of answering these questions, especially those related to setting thresholds, needs to consider VMT reduction goals that may already be established in local general plans, air quality plans, energy conservation plans or programs, climate action plans (CAPs), or greenhouse gas reduction plans. To some extent, cities and counties have already established 'acceptable VMT' growth amounts that will result from their general plan decisions about how and where to accommodate population and employment growth and what transportation network modifications will be made to support this growth. For suburban and rural areas, these decisions may result in little change in existing VMT per capita values. This outcome may create challenges for complying with the *OPR Technical Advisory* recommendation to expect at least a 15 percent reduction in existing VMT per capita as a significance threshold. Hence, a key part of the BCAG SB 743 Implementation Study is to help lead agencies answer the questions outlined above and understand how local versus state perspectives with respect to VMT reduction should be resolved.

More information about SB 743 implementation can be found at the following websites.

- OPR SB 743 Resources - https://opr.ca.gov/ceqa/updates/sb-743/
- Caltrans SB 743 Resources – https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743
- Fehr & Peers SB 743 Resources - http://www.fehrandpeers.com/sb743/.

02

Local Plan Review

As lead agencies transition to VMT as the new metric for transportation impact analysis under CEQA, assessing their adopted plans is often useful in understanding whether they have already established expectations about VMT reduction. This information is important to consider when establishing VMT impact significance thresholds.

Consistency Assessment

BACKGROUND

As lead agencies transition to VMT as the new metric for transportation impact analysis under CEQA, assessing their adopted plans is often useful in understanding whether they have already established expectations about VMT reduction. This information is important to consider when establishing VMT impact significance thresholds.

LOCAL PLANS

The local plans on the following pages were reviewed for this assessment.

Butte County 2020 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS) 2020-2040, BCAG, December 10, 2020

2020 Regional Transportation Plan/Sustainable Communities Strategy, Draft Supplemental Environmental Impact Report, BCAG, October 2020

http://www.bcag.org/documents/planning/RTP%20SCS/2020%20RTP%20SCS/Document%20Chapters/2020%20RTP%20SCS%20Document-ALL%20REVISED.pdf

http://www.bcag.org/documents/planning/RTP%20SCS/2020%20RTP%20SCS/SEIR/_2020%20RTP%20-%20SCS%20SEIR.pdf

The 2020 RTP/SCS contains multiple policies supportive of VMT and associated air pollution and GHG emissions reduction. The plan acknowledges that these reductions need to be balanced with improving accessibility and connectivity to destinations as framed in Policy 13.1.1 below.

> *13.1.1. Tailor transportation improvements to better connect people with jobs and other activities such as "Smart Mobility" concepts to increase system efficiencies and strive to reduce GHGs.*

The plan does not contain a specific VMT reduction goal but the SCS did achieve GHG per capita reductions in excess of the SB 375 targets for the region of which VMT per capita reductions contributed. As documented in Table 4.9-1 of the 2020 RTP/SCS SEIR, total VMT generated in the county was projected to increase from 4,705,417 under 2018 baseline conditions to 5,332,327 under 2040 conditions with the proposed plan. This represents a 13.3 percent increase although total VMT per capita was projected to decline about 3.4 percent from 20.7 to 20.0 between 2018 baseline and 2040[1].

[1] *The VMT forecasts exclude trip lengths external to the county and total VMT includes commercial vehicles.*

Butte County General Plan 2030, Circulation Element, Butte County, October 26, 2010 (Amended November 6, 2012)

Butte County General Plan 2030, Draft Supplemental EIR, Butte County, May 31, 2012

Butte County General Plan 2030, Draft EIR, Butte County, April 8, 2010

https://www.buttecounty.net/Portals/10/Planning/General%20Plan/2018%20Updated%20GP/9_Circulation_PRR.pdf

https://www.buttecounty.net/Portals/10/Planning/General%20Plan/Butte_SuppEIR_PublicReview.pdf?ver=2019-11-12-103207-967

https://www.buttecounty.net/Portals/10/Docs/GP2030/ButteCountyGP_PublicReview_EIR.pdf?ver=2019-07-25-160952-113

The general plan does not contain quantitative VMT reduction goals. However, multiple policies are supportive of achieving VMT reduction through increasing vehicle occupancies, sharing rides, promoting transit and active transportation, and supporting work-at-home programs.

> *CIR-P2.1 Carpooling shall be encouraged by providing additional carpool pickup and park-and-ride locations near transit centers and at freeway interchanges.*
>
> *CIR-P2.2 Trip reduction among County employees shall be encouraged. Specific measures to encourage trip reduction could include providing subsidies, bicycle facilities, alternative work schedules, ridesharing, telecommuting and work-at-home programs, employee education and preferential parking for carpools/vanpools.*
>
> *CIR-P2.3 Home occupations shall be encouraged through streamlined application processes that are appropriate to the intensity and proposed uses of the home business.*
>
> *CIR-P2.4 Employers shall be encouraged to provide transit subsidies, bicycle facilities, alternative work schedules, ridesharing, telecommuting and work-at-home programs, employee education and preferential parking for carpools/vanpools.*

Despite the policy support, the daily VMT was projected to increase from 4,126,991 to 6,397,512 between 2006 and 2030 with the proposed plan. A 2012 general plan amendment increased the 2030 daily VMT by 1,511.

Butte County Climate Action Plan (CAP), Butte County, February 25, 2014

http://www.buttecounty.net/Portals/10/Docs/CAP/ButteCountyCAPAdopted2014-02-25.pdf?ver=2014-04-25-152241-733

The Butte County CAP sets community GHG reduction targets for 2020 and 2040 compared to baseline 2006 levels but does not establish a specific VMT reduction goal. Under 2020 conditions, the CAP expected only about 0.2 percent of GHG emissions reduction to come from transportation measures. Annual VMT was largely expected to continue increasing from 464,302,660 in 2006 to 567,121,185 in 2020, and 677,283,969 in 2030 representing a total increase of 46 percent between 2006 and 2030.

City of Biggs General Plan, City of Biggs, January 2014

City of Biggs 2030 General Plan EIR, City of Biggs, March 2014

http://buttelafco.org/sites/default/files/resources/City%20of%20Biggs%20General%20Plan%20-%20January%202014.pdf

http://buttelafco.org/resources/master-documents/city-biggs-2030-general-plan-final-eir

The Biggs General Plan does not establish a specific VMT reduction goal. The circulation element focuses on providing an adequate level of service (LOS) for driving although the plan recognizes the importance of connectivity, complete streets, and multiple travel choices to reduce automobile dependence and VMT. The EIR acknowledges that implementation of the plan could increase VMT, but no details are provided.

City of Chico 2030 General Plan, City of Chico, April 2011 (Amended March 2017)

Chico 2030 General Plan Update, Draft Environmental Impact Report, City of Chico, September 2010

https://chico.ca.us/post/chico-2030-general-plan

https://chico.ca.us/post/draft-eir-chico-2030-general-plan

The City of Chico General Plan contains the following policy and supporting action related to setting VMT reduction expectations for land use projects.

> *Policy CIRC-1.5 (Vehicle Miles Travelled Analysis) – Consistent with State law, implement VMT assessments as part of the environmental review process under CEQA.*
>
> - *Action CIRC-1.5.1 (VMT CEQA Analysis) – For projects that require a full traffic analysis as part of the CEQA review process, perform a VMT analysis consistent with the California Office of Planning and Research CEQA Guidelines.*

The action statement to perform VMT impact analysis consistent with the Office of Planning and Research (OPR) CEQA Guidelines could be interpreted as an endorsement of OPR VMT threshold recommendations contained in the Technical Advisory on Evaluating Transportation Impacts in CEQA, OPR, 2018. The advisory is a companion to the CEQA Guidelines and includes the following general VMT reduction expectation for land use projects.

> *In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.*

The 2030 General Plan was an update to 1994 General Plan and contained an urban land use form with a better mix of land uses, higher densities, and more conducive to walking and bicycling. These changes were projected to reduce 2030 VMT per household approximately 11 percent from 64 miles to 56 miles.

City of Chico 2020 Climate Action Plan, City of Chico, No Date

http://chicosustainability.org/documents/ClimateActionPlan.pdf

The Chico CAP contains the following objectives related to a quantitative VMT reduction.

> *Objective 1: Reduce Vehicle Miles Travelled*
>
> *1.3: Residential Transportation Education and Challenge: The City will partner with BCAG to expand its public education and outreach campaigns to encourage residents to use alternative transportation and reduce their individual annual vehicle miles traveled by 8%...*

This is not a mandatory reduction goal used in evaluation of land use or transportation network decisions. Other objectives also support reducing VMT from large employers and by creating a transportation network that is multi-modal and supportive of active modes.

City of Gridley 2030 General Plan Circulation Element, City of Gridley, No Date

http://gridley.ca.us/public/uploads/pdfs/General_Plan-_Circulation_Element.pdf

The Gridley General Plan does not establish a specific VMT reduction goal. The plan contains land use and transportation policies supportive of minimizing VMT generation by creating a land use and transportation system conducive to walking and bicycling.

California State University, Chico Master Plan, Draft Environmental Impact Report (DEIR), CSU Chico, August 2020

https://www.csuchico.edu/fms/planning.shtml

The CSU Chico Master Plan DEIR included the following specific VMT impact thresholds based on the CSU Transportation Impacts Study Manual.

> *Project level (mixed-use) impacts if VMT per service population exceeds threshold of 15% below existing regional, sub-regional, or citywide VMT per service population*
>
> *Cumulative (mixed-use) impacts VMT per service population under "with project" condition exceeds citywide, regional, or sub-regional VMT per service population identified under the RTP/SCS condition [uses BCAG region from 2040 forecast]*

The impact analysis disclosed that compared to the no project condition in 2030, the project would increase total VMT by 6.4 percent and reduce VMT generated per student by 5.9 percent. As a result, implementation of the master plan was identified as causing a significant VMT impact. Mitigation identified the development of a TDM containing a menu of VMT reduction strategies. These types of strategies are dependent on the travel behavior of future students, faculty, and staff, which cannot be predicted with sufficient confidence or evidence to ensure that VMT generation would be reduced to acceptable levels. As a result, the impact was found to be significant and unavoidable after mitigation.

City of Oroville 2030 General Plan Circulation and Transportation Element, City of Oroville, March 2015

https://www.cityoforoville.org/home/showdocument?id=12188

The Circulation and Transportation Element contains one policy directly related to VMT reduction.

> *P2.5 Reduce the total vehicle miles traveled through designation of land uses that support multi-modal travel and provision of more direct routes to high activity locations.*

Other goals and policies in the general plan are supportive of VMT reduction through actions such as supporting mixed use development, but no quantitative reduction expectations are set for VMT.

City of Oroville Community Climate Action Plan, City of Oroville, March 2015

https://www.cityoforoville.org/home/showpublisheddocument?id=12191

The City set a target to reduce GHG emissions from community activities to 11 percent below 2010 levels by 2020. Approximately 1.6 percent of total GHG reductions were projected to come from transportation sector strategies that directly reduce VMT. Specific strategies included mixed use development, a balanced mode circulation plan, pedestrian network improvements, traffic calming, and voluntary commute trip reduction programs.

Town of Paradise 1994 General Plan, Town of Paradise, As Amended Through January 2008

https://www.townofparadise.com/index.php/forms-and-documents/planning/223-townofparadise-generalplan-1994/file

The Paradise General Plan does not establish a specific VMT reduction goal. The plan contains land use and transportation policies supportive of minimizing VMT generation by encouraging infill, reducing automobile dependence, and creating a land use and transportation system conducive to walking and bicycling. Policy CP-13 is an example of support for reducing VMT.

> *CP-13 Automobile dependency within Paradise should be reduced for local residents and visitors by implementing congestion management and trip reduction plan program that decrease the number of vehicle miles travelled which, in turn, reduces air pollution and congestion and saves energy.*

LEAD AGENCY TAKEAWAYS

To implement SB 743, lead agencies will need to determine their own significance thresholds for VMT impacts under 'baseline' and 'cumulative' conditions. Important considerations based on the local plan review above include the following.

- General plans contain population and employment growth that will increase total VMT. This growth in VMT has been accepted by the agency and is a starting point for considering any further reduction in VMT or the rate of VMT generation. In some cases, VMT per capita (or resident) may show small decreases but not to the level expected by the VMT threshold recommendations of OPR.
- CAPs often contain embedded VMT reductions that are not transparent. Lead agencies setting VMT reduction expectations as part of SB 743 VMT impact thresholds should verify their consistency with GHG reduction goals.
- CEQA analysis of air quality, GHG, and energy impacts may also contain embedded VMT reduction expectations. Like CAPs, lead agencies should verify consistency of VMT reduction expectations across these technical areas.
- The CSU Chico Master Plan EIR is an important case study for other lead agencies because the rest of Butte County will have similar challenges meeting the level of VMT reduction established by OPR and finding effective mitigation to reduce VMT.

While none of the local plans included specific quantitative VMT reduction goals for use in evaluating land use or transportation projects, some information was available related to VMT performance. This information is summarized in Table 1 on the following page.

TABLE 1: SUMMARY OF VMT PERFORMANCE EXPECTATIONS IN LOCAL PLANS

Jurisdiction	Type of Plan	Total VMT Performance	VMT/Capita Performance
BCAG	RTP/SCS	Regionally generated VMT to increases from 4,705,417 to 5,332,327 (2018-2040)	Regionally generated VMT/capita declines about 3.4% from 20.7 to 20.0 (2018-2040)
Butte County	General Plan	Increases from 4,126,991 to 6,399,023 (2006-2030)	NA
	CAP	Increases from 464,302,660 annually to 677,283,969 (2006-2030)	NA
Biggs	General Plan	NA	NA
Chico	General Plan	NA*	NA*
	CAP	NA	NA
CSU Chico	Master Plan	Campus VMT increases by 6.4% in 2030 compared to no project	Campus VMT/student decreases by 5.9% in 2030 compared to no project
Gridley	General Plan	NA	NA
Oroville	General Plan	NA	NA
	CAP	NA	NA
Paradise	General Plan	NA	NA

Notes:
NA = Not Available
* May have set expectation that VMT reduction should be consistent with OPR Technical Advisory recommendations

03

Methodology

This chapter summarizes the VMT analysis methodology options that could be used in Butte County to comply with SB 743. AnyAny recommendations areare not binding on lead agencies but do reflect the available evidence about which options are best suited to comply with CEQA expectations.

VMT Analysis Methodology

BACKGROUND

This technical document summarizes the VMT analysis methodology options that could be used in Butte County to comply with SB 743. Analysis methodology covers how projects will be analyzed to determine

- VMT impacts and involves three key questions for lead agencies.
- What model should be used to forecast VMT effects of land use and transportation projects?
- What VMT metrics should be used for VMT impact analysis?
- What analysis year constitutes baseline conditions for VMT impact analysis?

To help answer these questions, this document describes the available options along with their basic pros and cons and then offers a recommendation. This recommendation is not binding on lead agencies but does reflect the available evidence about which options are best suited to comply with CEQA expectations.

VMT ANALYSIS METHODOLOGY

State law does not dictate what VMT methodology or metric form to use. The CEQA Guidelines Section 15064.3(b)(4) provides substantial discretion for lead agencies to choose their methodology and VMT metric form.

> *15064.3(b)(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.*

As allowed by this discretion, lead agencies may select from available models that produce VMT estimates and forecasts or create their own. Under some circumstances, lead agencies may also choose to use qualitative methods per the CEQA Guidelines.

> *15064.3(b)(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.*

MODEL OPTIONS

The available models covering Butte County that are appropriate for SB 743 VMT impact analysis are limited to the California Statewide Travel Demand Model (CSTDM) and the BCAG TDM. Some local agencies may have older models used for past general plan updates but those models have not been updated or maintained. Other sketch planning models are also available that produce project generated VMT forecasts (see Appendix A). However, these models are not capable of producing city-wide or region-wide average VMT estimates that are recommended as benchmarks for VMT impact significancethresholds as specified in the Technical Advisory on Evaluating Transportation Impacts in CEQA, California Governor's Office of Planning and Research, December 2018. Therefore, they are not considered further in this study.

The CSTDM has a base year of 2015 and a future year of 2040 and is intended for inter-regional and statewide analysis. It was not designed for individual land use or transportation project scale applications but does produce VMT outputs that may be useful for purposes such as reasonableness checks. Other important limitations of this model are listed below.

- Model access is limited to Caltrans and select users.
- The 2015 analysis year was prior to the Camp Fire and too far removed from CEQA expectations for baseline conditions, which are typically current year (i.e., 2021).

Access to static VMT outputs from the model are available at the following Caltrans website.

- https://dot.ca.gov/programs/transportation-planning/multi-modal-system-planning/statewide-modeling/sb-743-vmt-impact-assessment

BCAG Model Traffic Analysis Zones (TAZ)

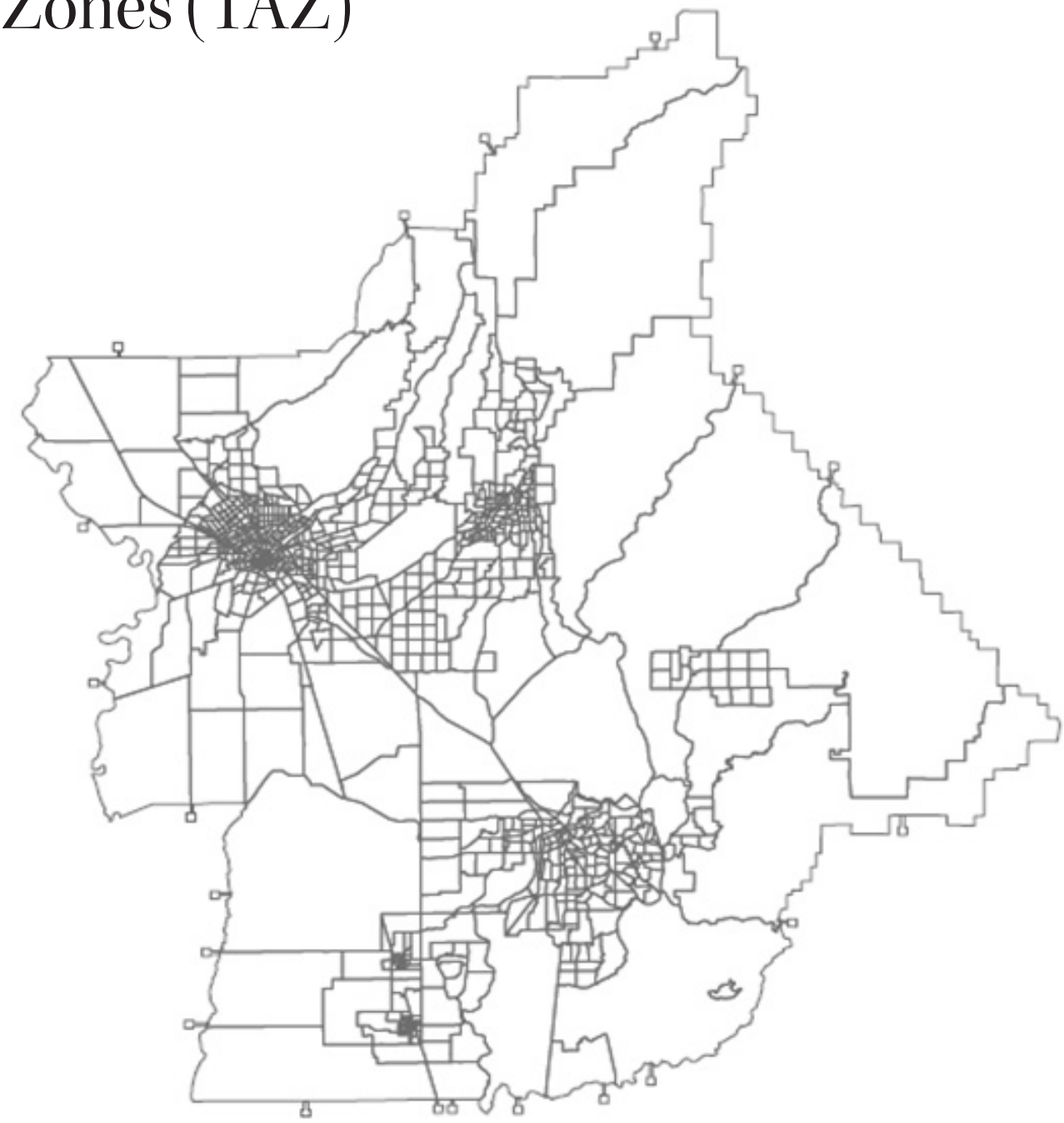


FIGURE 1: VERSION 1.1-3.17.21 OF THE BCAG RTP/SCS MODEL

Prepared by Fehr & Peers, 2021

The BCAG TDM was developed for regional planning and analysis purposes associated with the regional transportation plan/sustainable communities strategy (RTP/SCS). The current version of the model has a 2018 base year and forecast years of 2020 and 2040. The 2018 base year model represents pre-Camp Fire conditions while the 2020 version represents post-Camp Fire conditions. The 2020 version is currently being updated based on the Post Camp Fire Regional Population & Transportation Study. This study is using 'big data' such as mobile device tracking to update the 2020 population, employment, and traffic pattern inputs for the model.

While the primary purpose of the BCAG TDM is to support the RTP/SCS analysis, the model was designed with sufficient detail for local and project scale applications including VMT impact analysis. However, the model should be tested and potentially refined prior to its use for a local area project. Testing should verify that the model is appropriately sensitive within specific study areas and for the type of project being analyzed. The traffic analysis zone (TAZ) map is shown to the left to help visualize the level of detail. The TAZs are polygons that represent areas with similar land use and travel characteristics. Land use, demographic, and socioeconomic variables for each TAZ are used to estimate and forecast trips that travel between the TAZs. By tracking these trips across the network, VMT can be measured for each TAZ, any aggregation of TAZs, or for any physical network boundary. Project effects on VMT can be forecast by changing the TAZ inputs to represent the addition of the project and re-running the model to isolate changes in vehicle trips across the network. Preferably, a new TAZ will be created for the project site inputs. This approach makes it easier to track project effects throughout the model for a variety of travel demand output variables and the VMT changes can be visualized in terms of where volumes change due to the project.

As part of this SB 743 implementation study, the BCAG TDM was reviewed and updated to improve its capabilities for project scale VMT analysis. Minor network and land use corrections were made along with adjustments to trip lengths for those trips that either start or end outside the region. These trips were previously truncated at the model boundary. The new adjustment accounts for the trip length occurring outside the model boundary. The model is available from BCAG through the following website.

- http://www.bcag.org/Planning/Transportation-Forecasting/index.html

This website also contains links to the model development documentation and user guide.

MODEL RECOMMENDATIONS

Of the available models, the BCAG TDM is the best available model for VMT forecasts and analysis to comply with CEQA expectations related to SB 743. The model has been calibrated and validated to Butte County and been routinely used for a variety of regional and local environmental impact analysis. While lead agencies have the discretion to choose their preferred methodology, this study recommends use of the BCAG TDM.

METRIC OPTIONS

Lead agencies also have the discretion to select their preferred VMT metric(s). Visualizations and descriptions of several commonly used VMT metric options are provided to the right.

All these metrics have potential use for environmental impact analysis. Choosing the appropriate ones depends on the purpose of the analysis (i.e., air quality versus transportation impacts). The recommendations on the following page address this conditional aspect of VMT metrics.

TOTAL VMT

All vehicle-trips (i.e., passenger and commercial vehicles) or passenger only vehicle-trips are assigned on the network within a specific geographic boundary (i.e., model-wide, region-wide, city-wide). Vehicle volume on each link is multiplied by link distance.

TOTAL VMT GENERATED BY A PROJECT

All vehicle-trips are traced to the zone or zones of study. This includes internal to internal (II), internal to external (IX), and external to internal (XI) trips. May use final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims.

TOTAL VMT PER SERVICE POPULATION

Same method as above (Total VMT generated by a project) to estimate VMT and then divide by the population and employment of the zone or zones of study.

HOME BASED VMT PER RESIDENT

All automobile (i.e., passenger cars and light-duty trucks) vehicle-trips that start or end at the home are traced, but non-home-based trips made by residents elsewhere on the network are excluded.

HOME BASED WORK VMT PER EMPLOYEE

All automobile trips between home and work are traced.

METRIC RECOMMENDATIONS

The following VMT metrics are recommended for use in VMT impact analysis according to the specific type of project and analysis.

- Total VMT (by speed bin) – Used for air quality, energy, GHG and transportation impact analysis.
- Total project generated VMT – Used for air quality, energy GHG, and transportation impact analysis.
- Total VMT per service population (population plus employment) – Used for transportation impact analysis typically under cumulative conditions and for large area plans such as general and specific plans.
- Home-based VMT per resident – Used for transportation impact screening and analysis of residential projects.
- Home-based work VMT per employee – Used for transportation impact screening and analysis of work-related land uses

Of these metrics, the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* recommends the following uses for VMT impact screening.

- Use Total VMT for retail and similar land use projects.
- Use Home-based VMT per resident for residential land use projects.
- Use Home-based work VMT per employee for office projects.

All of the metrics listed can be produced by the BCAG TDM for base year and future year conditions. An example of the home-based VMT per resident metric from the model is provided below for each jurisdiction in Butte County. As shown in the chart, home-based VMT per resident changes over time. This is important when considering the final methodology question related to the selecting a specific analysis year to represent baseline conditions.

BASELINE OPTIONS

Baseline is normally defined as the analysis year when the environmental impact analysis is commenced. So, a project starting its impact analysis in 2021 would use this year as its baseline. The 2020 forecast above is the closest year to 2021 but will become less relevant over time. Further, an updated 2020 is being prepared as part of the Post Camp Fire Regional Population and Transportation Study (PCFS). The Camp Fire creates a unique methodology question for lead agencies. The base year of the model is 2018 representing conditions prior to the Camp Fire. The current 2020 forecast year was designed to represent post Camp Fire conditions but does not reflect the most complete data that was collected for the Post Camp Fire Regional Population and Transportation Study. As such, which year best represents current baseline conditions for CEQA analysis?

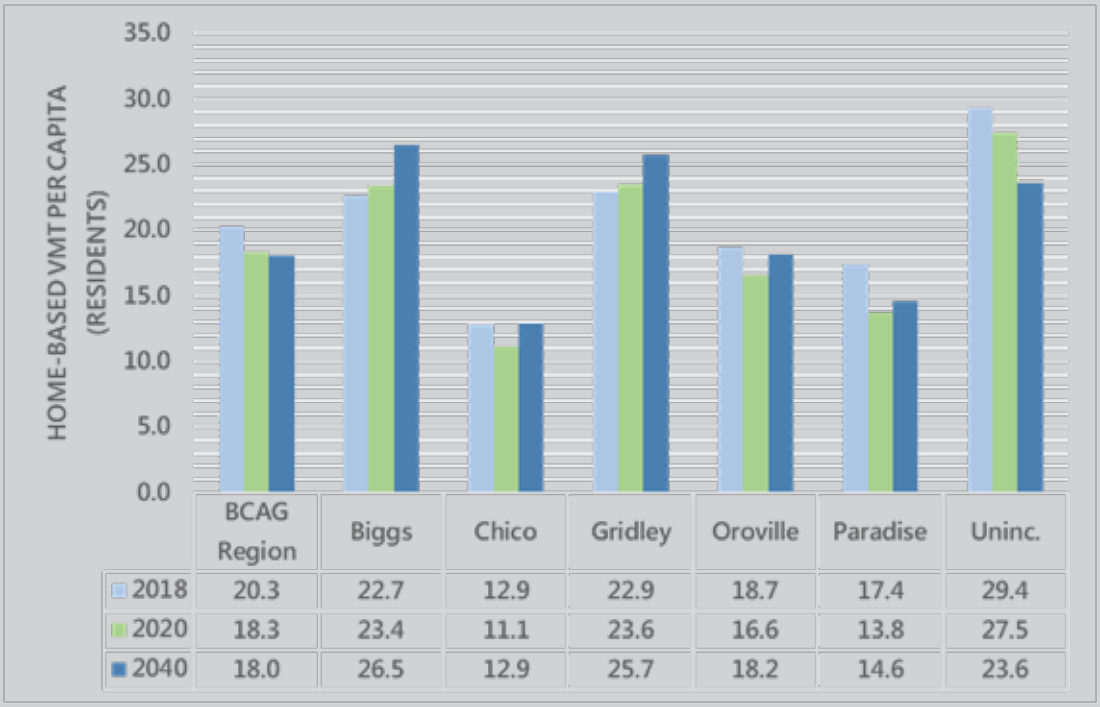
BASELINE RECOMMENDATIONS

Lead agencies may select the 2018 base year or current 2020 forecast year VMT forecasts as the best available data to represent CEQA baseline conditions. The VMT output from both model versions represent pre COVID-19 conditions but how well they match post Camp Fire conditions may differ. Determining which model version to use should consider how well the model volume outputs match available traffic counts in the study area and associated jurisdiction under pre-COVID-19 conditions in 2019 or 2020. When the new PCFS 2020 forecast year is ready, that 2020 version of the model is expected to better represent post Camp Fire conditions but should still be checked against local traffic counts as noted above.

Over time, baseline conditions may require the use of interpolation to represent the current year. For example, an analysis in 2023 may require an estimate of 2023 VMT conditions. As part of the PCFS, a 2025 version of the model is being developed. Interpolating between 2020 and 2025 may be necessary to produce baseline year VMT estimates for 2022, 2023, 2024, etc. BCAG typically updates the TDM every four to five years so interpolation may only be necessary in between model updates.

FIGURE 2: HOME-BASED VMT PER CAPITA (RESIDENT)

Source: Modified Version 1.1 - 3.17.21 of the BCAG RTP/SCS model



	BCAG Region	Biggs	Chico	Gridley	Oroville	Paradise	Uninc.
2018	20.3	22.7	12.9	22.9	18.7	17.4	29.4
2020	18.3	23.4	11.1	23.6	16.6	13.8	27.5
2040	18.0	26.5	12.9	25.7	18.2	14.6	23.6

04

VMT Impact Significance Thresholds

This chapter summarizes the VMT impact significance threshold options and recommendations that could be used by lead agencies in Butte County to comply with SB 743.

Assessing Lead Agency Choices

BACKGROUND

This technical document summarizes the VMT impact significance threshold options and recommendations that could be used by lead agencies in Butte County to comply with SB 743. Selecting a threshold is a process that establishes what amount of VMT change would be considered unacceptable such that a significant impact would occur that requires mitigation. This is a difficult decision because VMT growth is a direct consequence of planned population and employment growth plus desired economic activity. In addition, VMT is the result of individual decisions on how to access destinations where activities occur such as employment, education, medical treatment, food purchase, physical and mental fitness, etc. These are all elements of economic productivity and lifestyle sustenance. So, what is the basis for deciding how much change in VMT attributable to land use and transportation projects is acceptable versus unacceptable?

To help answer this fundamental question, let's start with the general expectations of the CEQA Guidelines for adopting or using thresholds of significance.

> *15064.7 Thresholds of Significance.*
>
> (a) 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 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.

These general expectations help define a threshold and establish the process for creating them, but they do not help address the basic question above related to VMT change. For that guidance, some details are available in the original SB 743 statue and in the CEQA Guidelines Sections cited below.

> *Public Resources Code (PRC) 21099(b)(1) The Office of Planning and Research shall prepare, develop, and transmit to the Secretary of the Natural Resources Agency for certification and adoption proposed revisions to the guidelines adopted pursuant to Section 21083 establishing criteria for determining the significance of transportation impacts of projects within transit priority areas.* ***Those criteria shall promote the reduction of greenhouse gas emissions, the development***

of multimodal transportation networks, and a diversity of land uses. *In developing the criteria, the office shall recommend potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. The office may also establish criteria for models used to analyze transportation impacts to ensure the models are accurate, reliable, and consistent with the intent of this section.*

21099(e) ***This section does not affect the authority of a public agency to establish or adopt thresholds of significance that are more protective of the environment.***

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.*

This background material indicates that projects that would reduce baseline VMT should be presumed to have a less than significant impact. Whether this means that projects that cause an increase in VMT would have an automatic significant VMT impact is not clearly stated but could be implied. Projects locating in transit priority areas (TPAs) are called out separately as potentially deserving of the presumption for a less than significant VMT impact, but no evidence was provided to demonstrate why their added VMT would not result in the same adverse environmental effects of projects outside a TPA.

To complete the background material, state agencies have also developed the following guidance material containing threshold recommendations.

- *Technical Advisory on Evaluating Transportation Impacts in CEQA*, California Governor's Office of Planning and Research (OPR), December 2018.
- *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, ARB, January 2019.
- *Vehicle Miles Traveled-Focused Transportation Impact Study Guide*, Caltrans, May 2020.

The OPR Technical Advisory is particularly important for lead agencies to consider in their threshold choices. PRC 21099(b)(1) directed OPR to revise the CEQA Guidelines to establish criteria for determining the significance of transportation impacts for the new metric, VMT. As noted above, the content of the CEQA Guidelines related to VMT significance thresholds is largely qualitative. Specific quantitative VMT significance thresholds are only provided in the OPR Technical Advisory. Whether the Technical Advisory threshold recommendations will carry the same legal weight as the CEQA Guidelines has not yet been tested in court. However, the Caltrans guidance above endorses use of the OPR threshold recommendations and the ARB threshold evaluation is also supportive of OPR's quantitative VMT thresholds.

With that background, the remainder of this document outlines three VMT significance threshold options for lead agencies in Butte County followed by specific recommendations based on current evidence. As evidence evolves, recommendations may change.

THRESHOLD OPTIONS

For purposes of this study, three threshold options are presented.

- Option 1 – Apply the CEQA Guidelines thresholds contained in 15064.3.
- Option 2 – Apply the OPR Technical Advisory thresholds for jurisdictions within a metropolitan planning organization (MPO) boundary.
- Option 3 – Apply a qualitative threshold based on interference with state VMT/GHG reduction goals.

Each threshold option is described in more detail below along with justification for its use.

OPTION 1 – CEQA GUIDELINES

As suggested above, the CEQA Guidelines Section 15064.3 can be interpreted as establishing a threshold where 'any' increase in VMT above baseline conditions would constitute a significant VMT impact. This threshold is recommended in the OPR Technical Advisory for retail land use projects. Caltrans also supports this threshold for roadway capacity projects stating, "Within MPO areas…, a project that results in an increase in VMT when comparing the future build alternative to the future no-build alternative (i.e., the VMT is higher under the future build scenario) will generally be considered significant…"

This threshold has the strongest compliance with the CEQA Guidelines but would likely result in most projects having a significant VMT impact. While this would maximize the potential for mitigation to reduce VMT in Butte County it would come at the cost of performing more environmental impact reports (EIRs) instead of negative declarations that have been common in the past especially for small projects. This threshold would also ignore that VMT is connected to quality of life for which CEQA was intended to protect as noted below.

> *PRC 21000. LEGISLATIVE INTENT*
> *The Legislature finds and declares as follows:*
> *(b)* ***It is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man.***
>
> *PRC 21001. ADDITIONAL LEGISLATIVE INTENT*
> *The Legislature further finds and declares that it is the policy of the state to:*
>
> *(d) Ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions.*

The need for EIRs could be reduced for jurisdictions willing to perform general plan updates that address VMT impacts in the general plan EIR with the explicit objective of taking advantage of 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 (this means that project-level mitigation to lessen the VMT impact must be included) and the project is consistent with the general plan.

> *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.*

[1] Transportation Analysis Under CEQA First Edition, Evaluating Transportation Impacts of State Highway System Projects, California Department of Transportation, September 2020.
[2] A General Plan EIR can also be used to streamline project-level VMT analysis though other methods such as tiered EIRs (CEQA Guidelines Section 15152) and Program EIRs (CEQA Guidelines Section 15168).

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 Butte County jurisdictions, addressing transportation VMT impacts in the City or County General Plan EIR would streamline subsequent project CEQA reviews and could improve the ability of the jurisdiction to reduce VMT through mitigation programs (i.e., VMT impact fee program, exchange or bank).

OPTION 2 - OPR TECHNICAL ADVISORY

The OPR Technical Advisory contains VMT threshold recommendations that vary by type of project and type of land use as follows.

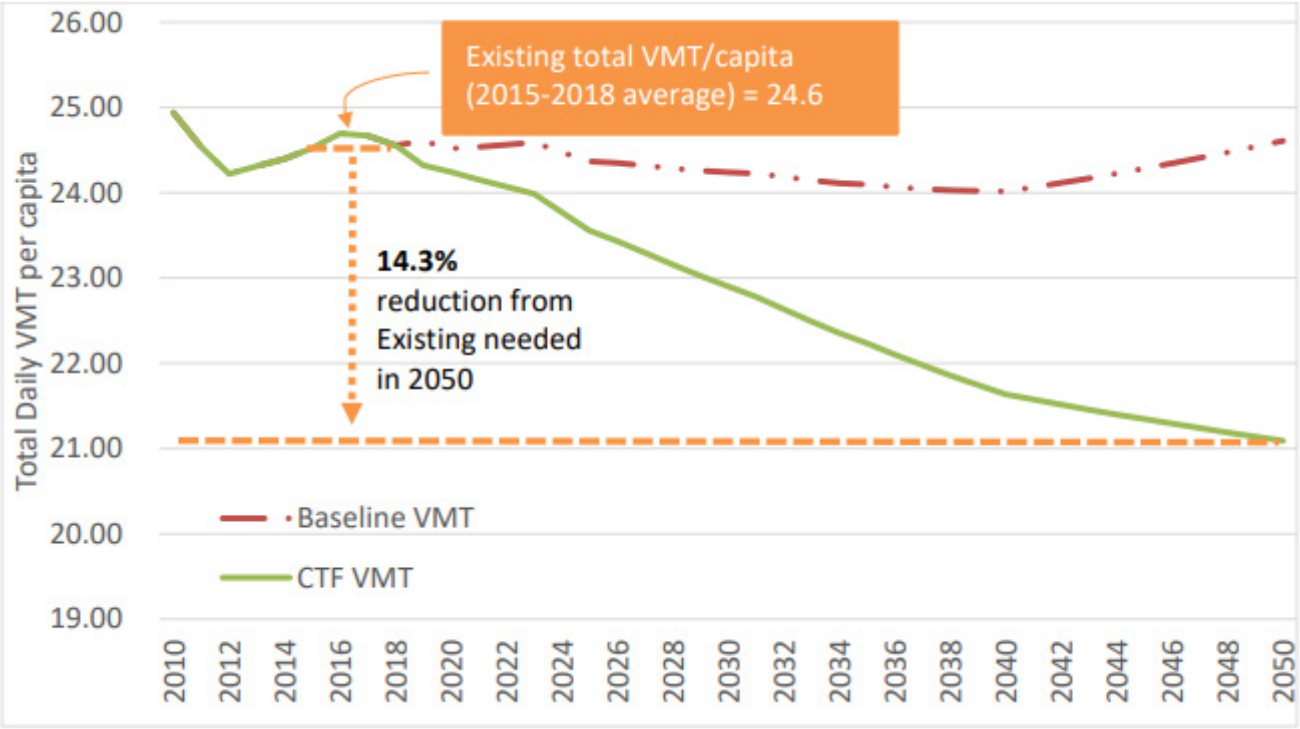
- Residential projects – A proposed project exceeding a level of 15 percent below existing (baseline) VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita.
- Office projects – A proposed project exceeding a level of 15 percent below existing (baseline) regional VMT per employee may indicate a significant transportation impact.
- Retail projects greater than 50,000 square feet – A net increase in total VMT may indicate a significant transportation impact.
- Mixed-use projects – Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture.

- Other project types – The OPR Technical Advisory recommends that lead agencies consider the CEQA statute and CEQA Guidelines sections cited above in the development of thresholds for other project types. In addition, the Technical Advisory advises avoiding projects or actions that would increase total VMT or encourage development in less travel-efficient locations. This information may indicate that any increase in total VMT could constitute a significant impact.
- 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.
- Transportation projects – Lead agencies should develop a project-level threshold based on the VMT levels required to achieve the GHG reduction goals of the ARB 2017 Scoping Plan and Mobile Source Strategy. Based on analysis documented in 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, California Air Resources Board, January 2019, California has a VMT growth capacity of 6.5 percent by 2050 above a 2015-2018 baseline average. For Butte County, this equates to about 326,350 weekday VMT in 2050.

An important question raised by the land use specific thresholds is what evidence exists that treating retail (and potentially 'other project types') differently is justified? One VMT generated by retail has the same environmental impacts as one VMT generated by a residential use. OPR staff have also recommended during SB 743 office hours hosted by the agency that other non-residential land uses not listed above could use the net increase in total VMT threshold specified for retail. While adding retail land uses can contribute to shorter vehicle trip lengths for shopping trips, the new use will attract new employee and vendor vehicle trips that may result in higher VMT levels. Lead agencies should verify that potential reductions in VMT from redistributed shopping trips are sufficient to offset any new VMT generated by the employee and vendor vehicle trips.

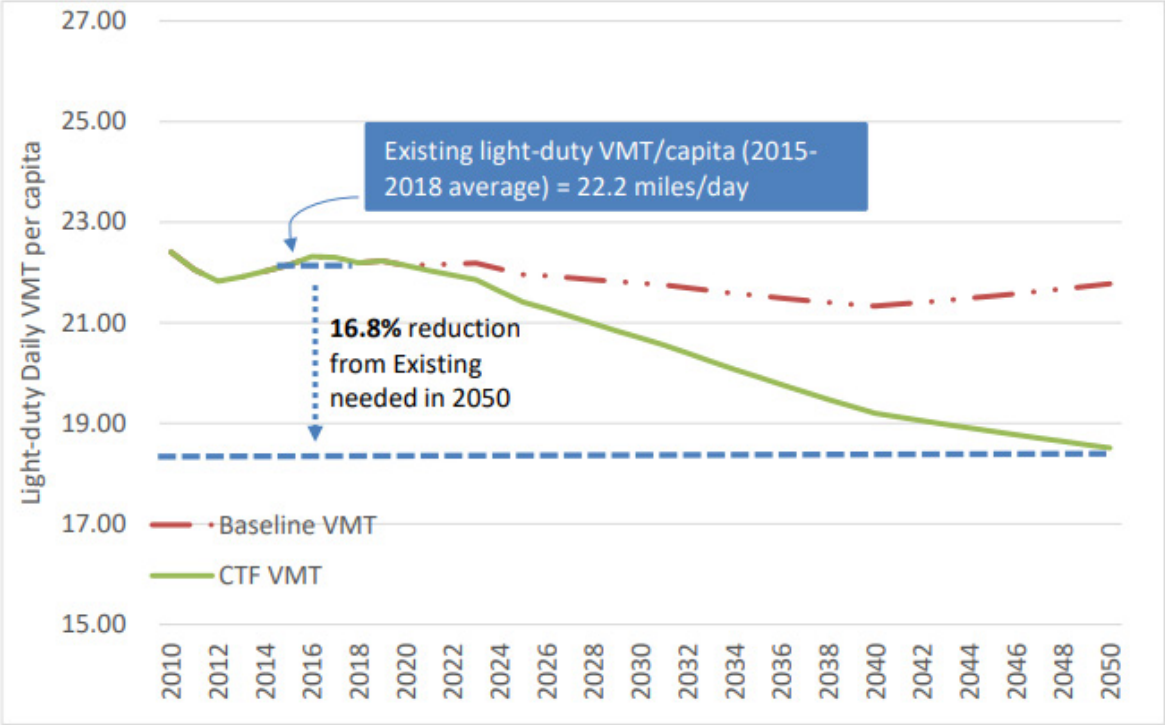
Another potential limitation of using the OPR Technical Advisory recommendations directly is that the 15 percent reduction is less than recommended by ARB in the 2017 *Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, California Air Resources Board, January 2019. This document demonstrates that a reduction of 16.8 percent in light duty vehicle VMT per capita (or 14.3 percent if measuring total VMT per capita) is needed to achieve the state's GHG reduction goals (see Figures 3 and 4 on the following pages). Use of 16.8 in place of the 15 percent per capita above would help strengthen the OPR thresholds. This modified threshold could also be applied for 'retail' or 'other project types' since the ARB analysis was based on VMT from all sources. Doing so would avoid the potential disparate treatment problem noted above.

FIGURE 3: STATEWIDE TOTAL VMT/CAPITA



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

FIGURE 4: STATEWIDE LIGHT-DUTY VMT/CAPITA



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

One benefit of relying on ARB percentages as part of the OPR thresholds is the CEQA Guidelines provision in Section 15064.7(c) highlighted below.

> *15064.7 Thresholds of Significance.*
> *(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.*

ARB meets the criteria of being a public agency and having noted expertise in the areas of VMT and GHG emissions. Further, the recommended percentages above were developed in specific consideration of SB 743 requirements. ARB's 2017 Scoping Plan (p. 11) provides that its recommendations "are non-binding, and intended as supportive documentation that can be used at a lead agency's discretion to help substantiate significance thresholds used for purposes of compliance with SB 743, and to help minimize occurrence of duplicate or redundant analysis across transportation and climate resource impact areas under CEQA."

OPTION 3 – INTERFERENCE WITH STATE ABILITY TO MEET VMT/GHG REDUCTION GOALS

Considering the information above, expectations for VMT reduction are largely coming from the state as part of GHG reduction goals but without a specific legal requirement that a local agency reduce VMT levels. Local jurisdictions may value VMT reduction differently than the state, which could influence their decision about what amount of VMT change should be deemed unacceptable such that a significant impact would occur. Lead agencies have discretion to set their own thresholds as outlined in CEQA Guidelines Section 15064.

> *15064.(b)(1) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.*

Therefore, the following VMT significance threshold is designed to help lead agencies balance local and state expectations.

- The proposed project will cause a significant VMT impact if its implementation substantially interferes with achievement of VMT reduction goals of the state consistent with CARB's 2017 Scoping Plan.

This threshold recognizes that VMT reduction is tied to state GHG reduction goals and allows a lead agency to assess VMT impacts of local projects based on whether they would interfere or prevent the state from taking actions necessary to reduce VMT consistent with state goals. The state has the authority to implement a wide variety of actions that could effectively reduce VMT such as higher gas taxes, a new VMT tax, new tolls, etc. Local projects that do not interfere with this authority could reflect that outcome as part of their VMT impact analysis using this threshold. The project's environmental review document should still disclose relevant information about how the project's VMT performance compares to applicable threshold recommendations from state agencies such as OPR and ARB, but this information would not be used as the basis for a significance conclusion.

OTHER OPTIONS

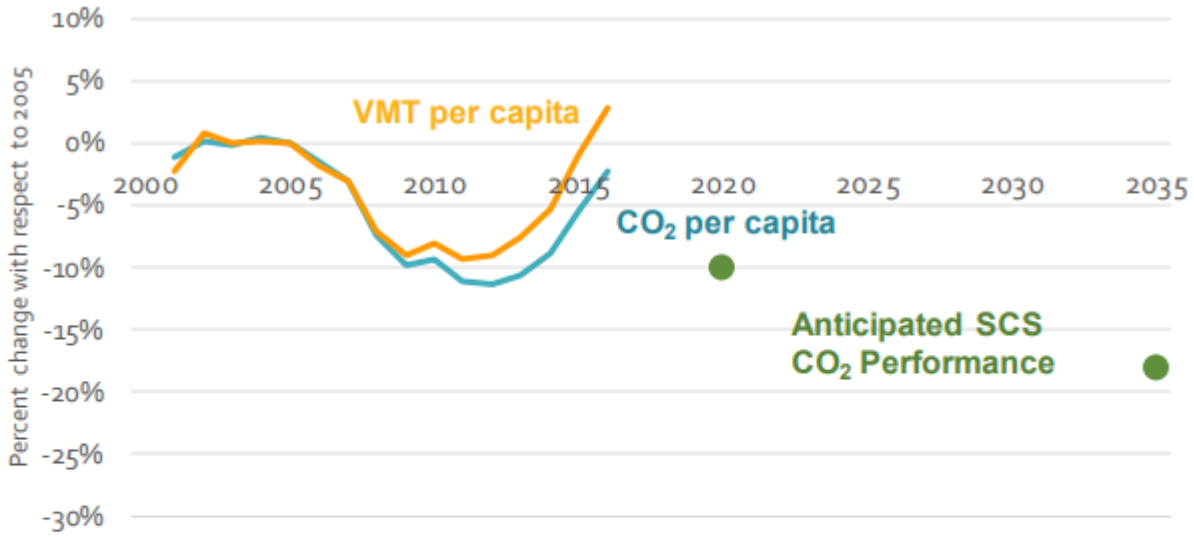
A variety of other options or modifications of the options above are available for lead agencies to consider. The options presented above cover the range of options with Options 1 and 3 representing the opposite ends of the range. Under any option, it is also important to note that final VMT impact significance determinations should also consider other available evidence.

Two important examples of this evidence are listed below.

- *2018 Progress Report, California's Sustainable Communities and Climate Protection Act*, California Air Resources Board, November 2018 (referred to as the Progress Report in the remainder of this document)
- *California Air Resources Board Improved Program Measurement Would Help California Work More Strategically to Meet Its Climate Change Goals*, Auditor of the State of California, February 2021 (referred to as the Audit Report in the remainder of this document).

The Progress Report measures the effect of SB 375 revealing that VMT and GHG per capita increased between 2010 and 2016 and are trending upward (see Figure 5 on the following page). This outcome was in direct contrast to all the regional transportation plan/sustainable communities strategies (RTP/SCSs) predicting declines in GHG per capita in alignment with SB 375 reduction targets. With VMT per capita trending up due to conditions beyond the control of local jurisdictions (i.e., increased economic activity, low fuel prices, etc.), concluding that a project would have a less than significant VMT impact based on its performance below the OPR or ARB recommended thresholds would have limited confidence especially when relying on RTP/SCS travel demand models to produce the project VMT forecasts.

FIGURE 5: STATEWIDE CO_2 AND VEHICLE MILES TRAVELED (VMT) PER CAPITA TREND WITH RESPECT TO ANTICIPATED PERFORMANCE OF CURRENT SB 375 SCSs



Source: CDTFA, U.S.EIA, U.S.EPA, CARB

[2] CO_2 and VMT calculated based on California Department of Tax and Fee Administration (CDTFA) gasoline fuel sales data.

Source: https://ww2.arb.ca.gov/resources/documents/tracking-progress

The Audit Report is a more recent assessment of ARB's GHG reduction programs, which also found that VMT and its associated GHG emissions are trending in the wrong direction. Per the audit, the state is not on track to achieve 2030 GHG reduction goals and emissions from transportation have not been declining. Transportation related GHG emissions increased between 2013 and 2018.

THRESHOLD RECOMMENDATIONS

So how should lead agencies approach VMT threshold setting given their discretion and the legal risk associated with CEQA compliance? Since an impact under CEQA is a change to the existing environment, a starting level for potential thresholds is the baseline. This thinking would support Option 1 and would likely have the strongest evidence basis for making significance determinations. However, many lead agencies and project applicants are not prepared for the changes in CEQA documentation that would likely occur under this option where most projects would have a significant VMT impact. The option also ignores the positive role that VMT plays in the economy and quality of life. Considering the remaining two options, the differences are certainly stark and neither has been tested in the courts

Option 2 complies with state expectations as expressed through CEQA guidance prepared by OPR and ARB while Option 3 opts for more local control of the threshold. Under Option 3, local land use projects would likely be found to have less than significant VMT impacts because they would not interfere with the state's ability to achieve desired VMT reductions through state actions. This is factual and supported by evidence but involves uncertainty without court validation. Given the litigious nature of CEQA, Option 3 involves more risk associated with CEQA compliance, so Option 2 has generally been accepted by other local jurisdictions throughout the state. Option 2 also has the endorsement of Caltrans as noted in the Vehicle Miles Traveled-Focused Transportation Impact Study Guide, Caltrans, May 2020.

> *Caltrans recommend(s) use of OPR's recommended thresholds for land use projects. As each lead agency develops and adopts its own VMT thresholds for land use projects, Caltrans will review them for consistency with OPR's recommendations, which are consistent with the state's GHG emissions reduction targets and CARB's Scoping Plan.*

Whatever option a lead agency chooses should be supported by substantial evidence. This includes strengthening the evidence supporting Option 2 and being prepared to explain their rationale and evidence in their environmental documents and when responding to public and agency comments during environmental document reviews.

USE OF SCREENING

As part of selecting thresholds, lead agencies should also decide if they will allow the use of VMT impact screening as outlined in the OPR Technical Advisory. Screening is an optional approach to impact analysis that is intended to streamline the review of projects that can be presumed to have a less than significant VMT impact. Instead of performing a complete VMT impact analysis for these projects, a partial analysis is used to assess whether the less than significant presumption is supported. While this process involves much less time and effort than a complete analysis, it also does not include all of the evidence that would be provided in a complete analysis. Hence, a lead agency is trading off streamlined review against having complete evidence to support the VMT impact finding.

Per the Technical Advisory, screening is generally intended for smaller, less complex projects or for projects supportive of SB 743 goals such as affordable housing projects and projects located near high quality transit stations. If a project meets any of the following criteria, it may be presumed to cause a less-than-significant VMT impact without further study. This presumption is not a "safe harbor" but is subject to other substantial evidence verifying the presumption. All projects should be consistent with the applicable general plan as well as the RTP/SCS. See the OPR Technical Advisory for all the details associated with each screening criteria.

- The project generates less than 110 vehicle trips per day. This screening threshold does not use VMT but is tied to vehicle trip generation of project sizes allowed to be exempted from CEQA review.
- The project is a residential or office land use and located in a low VMT traffic analysis zone (TAZ). The project should contain similar features to other built environment features in the area to ensure it will also generate low VMT. To qualify as a low VMT TAZ for residential land uses, the TAZ should generate home-based VMT per resident that is equal to or lower than 15 percent below the city-wide or region-wide average. For office land uses (and possibly other work-related land uses), the TAZ should generate home-based work VMT per employee that is equal to or lower than 15 percent below the region-wide average.
- The project is located in a transit priority area (TPA) as defined in CEQA Guidelines Section 15064.3 and PRC Sections 21064.3 and 21155 and does not contain features that would be inconsistent with low VMT generating land uses. No transit stations in Butte County currently qualify for TPA status although the RTP/SCS identified future areas in Chico where enhanced transit service and growth are to be focused.
- The project contains 100 percent affordable residential development.
- The project is a local-serving retail or other local serving employment project less than 50,000 square feet (larger retail projects may also qualify due to distance from other population centers).

For lead agencies interested in using the low VMT TAZ screening, map examples for residential and office land uses are provided in Figures 6 and 7, respectively based on a comparison of home-based VMT per resident and home-based work VMT per employee to the regional averages for each metric. Additional maps based on comparisons to citywide averages can also be produced for interested agencies.

Photo: Chico Paper Co Exterior, www.downtownchico.com

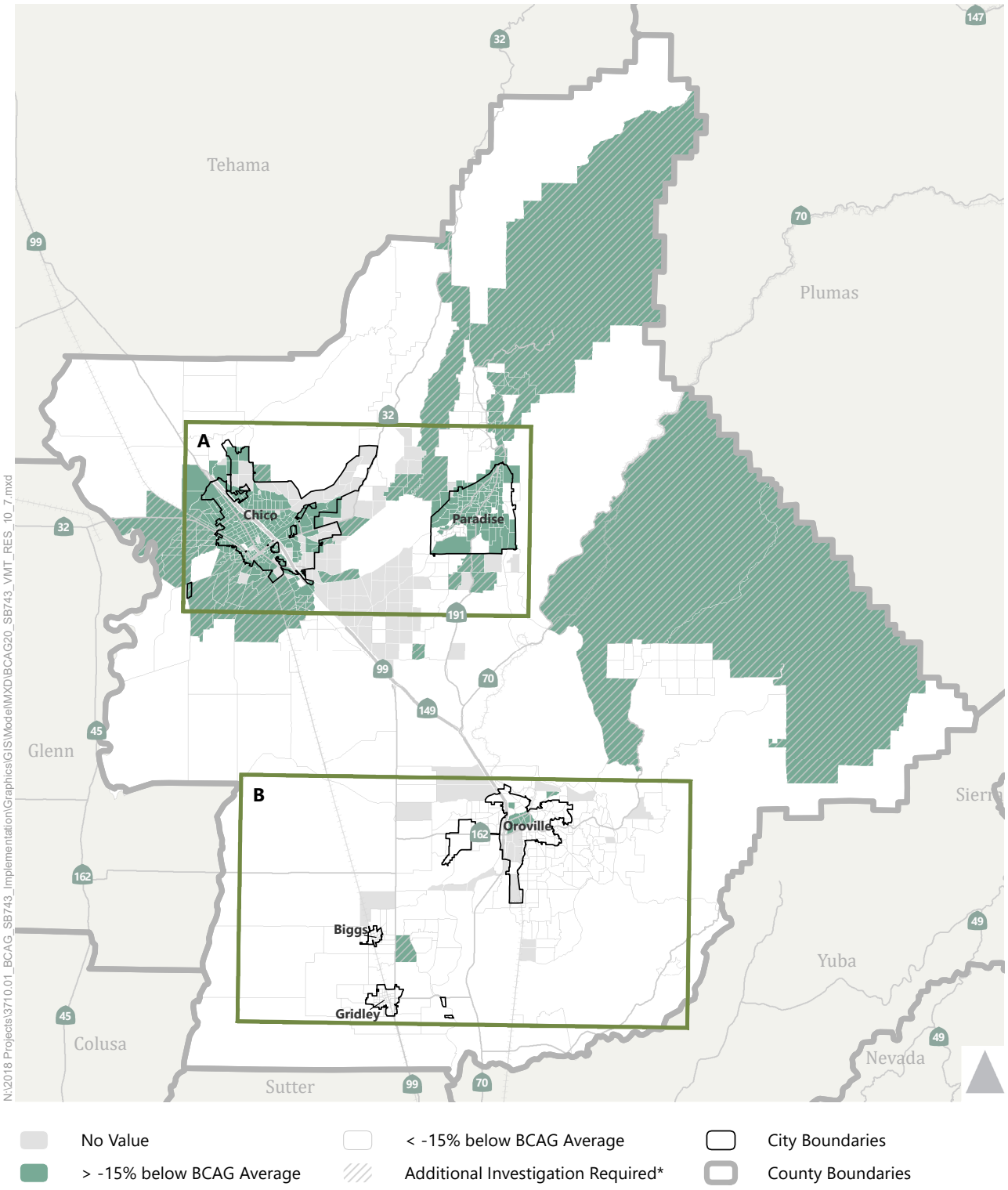


FIGURE 6: DAILY HOME-BASED VMT PER RESIDENT COMPARISON TO REGIONAL AVERAGE

Source: Modified Version 1.1-3.17.21 of the BCAG RTP/SCS Model

**Area may not qualify for screening due to land use context.*

A, B: Inset maps can be found in Figure 6A

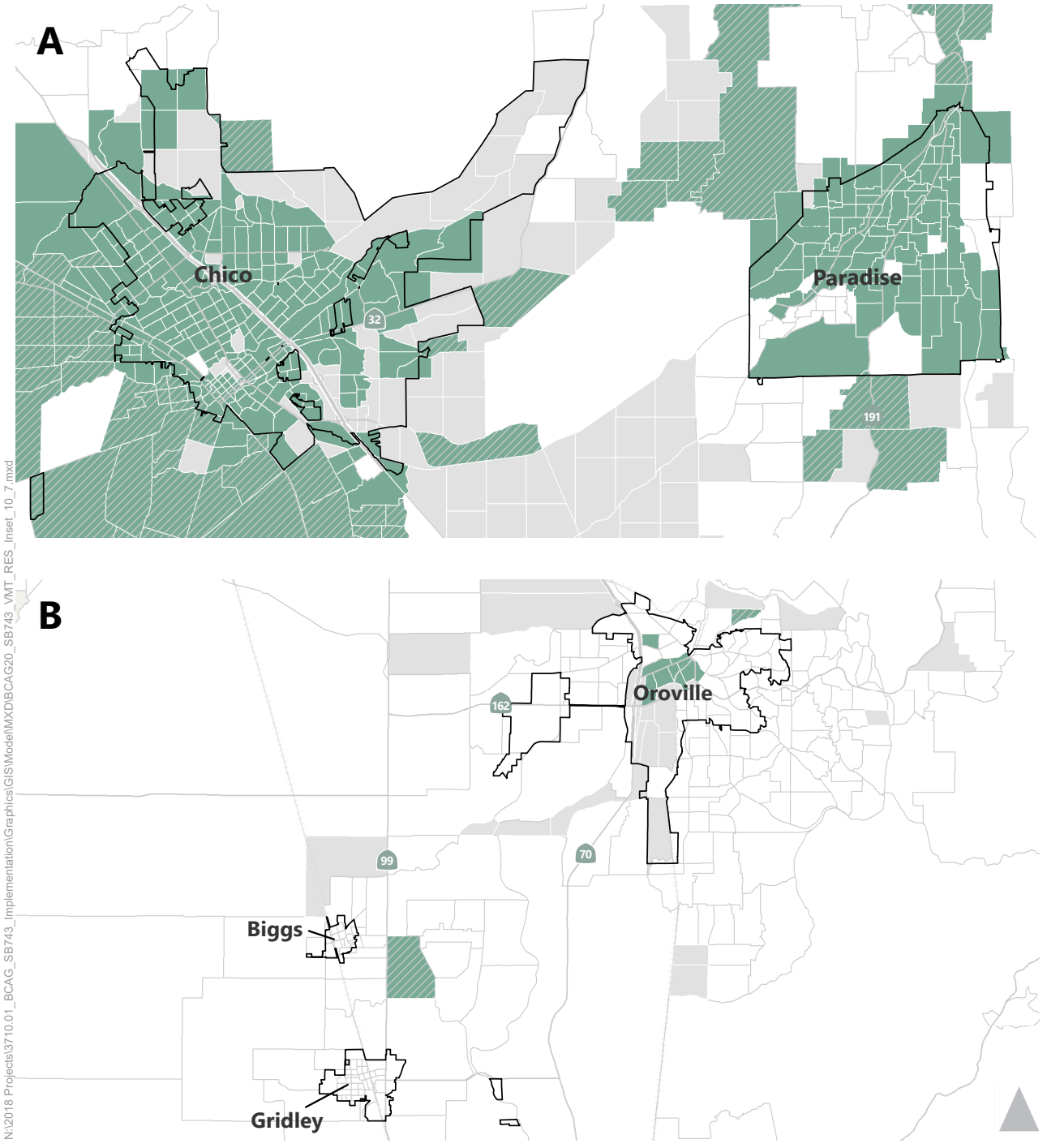


FIGURE 6A: DAILY HOME-BASED VMT PER RESIDENT COMPARISON TO REGIONAL AVERAGE

Source: Modified Version 1.1-3.17.21 of the BCAG RTP/SCS Model

**Area may not qualify for screening due to land use context.*

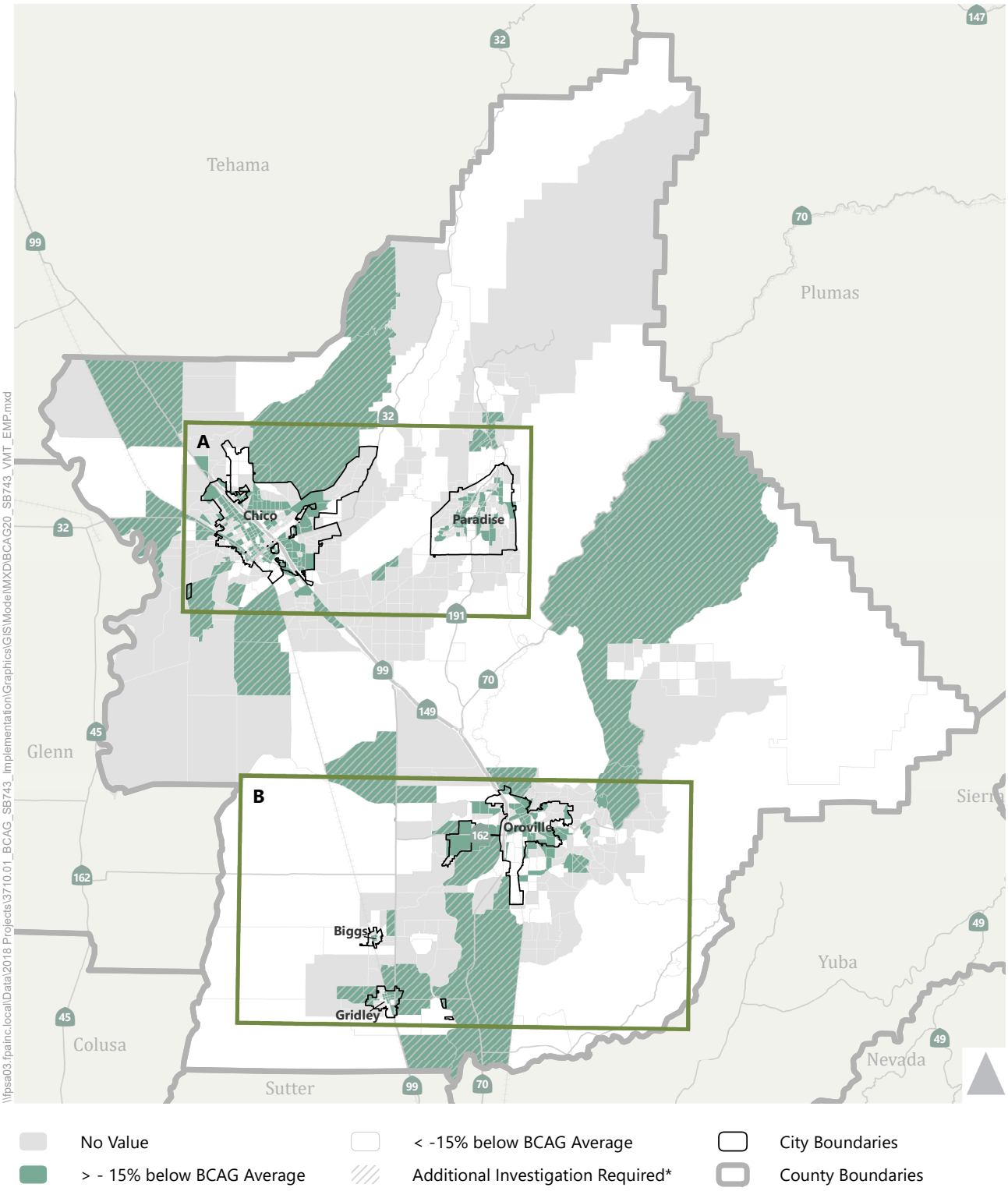


FIGURE 7: BCAG MODEL (2020) DAILY HOME-BASED VMT PER EMPLOYEE COMPARISON TO REGIONAL AVERAGE

**Area may not qualify for screening due to land use context.*
A, B: Inset maps can be found in Figure 7A

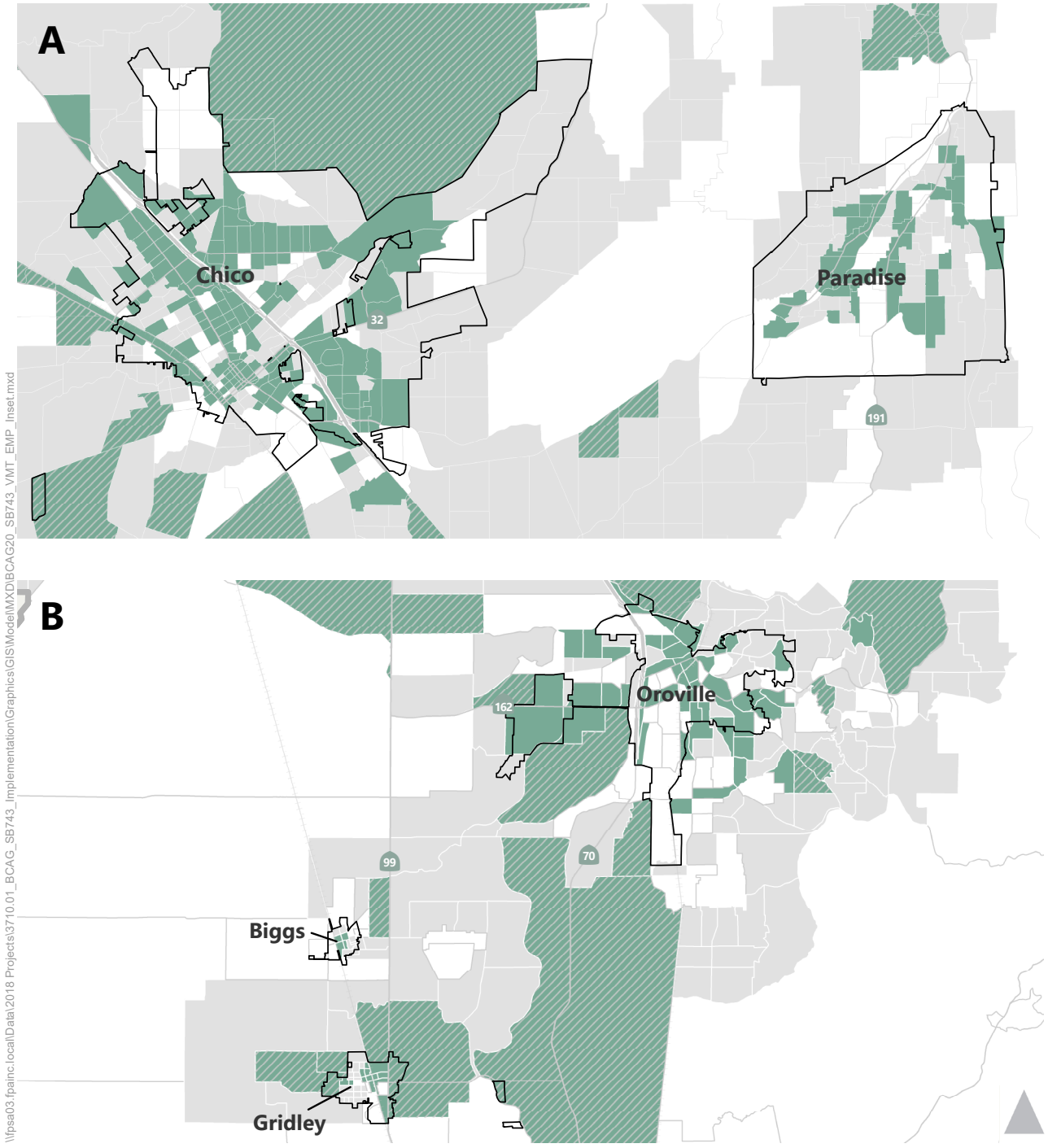


FIGURE 7A: BCAG MODEL (2020) DAILY HOME-BASED VMT PER EMPLOYEE COMPARISON TO REGIONAL AVERAGE

**Area may not qualify for screening due to land use context.*

05

Case Studies

Case Study Testing

BACKGROUND

The CEQA Guidelines Section 15064.3 and the Technical Advisory introduced specific recommendations for VMT impact screening and analysis. Prior to this guidance, lead agencies tended to rely on CEQA exemptions or streamlining to screen or relieve projects of performing transportation impact analysis. Lead agencies may have also used vehicle trip generation triggers to determine if a project was small enough that it could be presumed to have less than significant impacts on the transportation system.

The challenge with using any screening approach is that limited evidence is typically available upon which an impact determination is made. While this accelerates the CEQA review process, the impact conclusions lack the benefit of the substantial evidence offered by a complete impact analysis. To help BCAG member agencies assess the outcomes of VMT impact screening and to understand the impact analysis steps for projects that fail screening, four case studies were evaluated. These case studies were nominated by member agencies and include a mix of project sizes and locations.

VMT IMPACT SCREENING TESTS

The Technical Advisory contains five VMT impact screening options of which the four listed below are relevant in Butte County.

1. **Small Project**: the project is estimated to generate or attract fewer than 110 daily vehicle trips.
2. **Low VMT Areas**: the project is located in a TAZ where VMT generation is 15 percent or more below the applicable land use threshold.

    a. Residential projects – 15 percent or more below the regional home-based VMT per resident.

    b. Office projects – 15 percent or more below the regional home-based work VMT per worker.
3. **Affordable Residential Development:** the project consists of 100 percent affordable housing units.
4. **Local Serving Retail:** the project is anticipated to be local serving (as opposed to regional-serving retail development) and is less than 50,000 square feet (<50 KSF) in size.

The excluded screening test is for land use projects locating within ½ mile of a high-quality transit station. Current transit stations in Butte County do not qualify for this designation.

CASE STUDY ASSESSMENT

The four case studies are briefly described below largely based on notice of preparation (NOP) or initial study information. They are also mapped on Figure 8, which shows the relationship of each project location to the low VMT residential areas in the county.

- **Case Study 1 – Stonegate**: The project includes general plan amendments and rezones to allow for the following trip generating land uses.
  - 460 single-family residential (SFR) units
  - 208 multi-family residential (MFR) units
  - 343,223 square feet of commercial (individual buildings range from 9,351-59,193 square feet)
  - 2.6-acre park
- **Case Study 2 – Ashlock-Garden Oak Estates**: This project involves approval of the development of a mixed-use subdivision that includes commercial lots, SFR and MFR lots, and significant open space with forested habitat. The proposed subdivision includes 118 single-family homes, 28 multi-family units on 14 duplex lots, and 4 lots (4.22 acres total) of commercial space offering approximately 40,000 square feet of total building space designed for local serving uses.
- **Case Study 3 – Leen**: The project is a tentative subdivision map to divide an approximately 18.5- acre property into 22 parcels (21 residential lots and one open space lot). The 21 clustered residential lots range in size from 0.19 to 0.75 acres.
- **Case Study 4 – Estates at Lindo Channel**: The project includes a general plan amendment and rezone to reduce the residential density for the site and a small-lot subdivision and planned development permit to divide the site into 22 SFR lots.

The first step in the case study evaluation was to perform VMT impact screening for each project. The screening results are summarized in Table 2 on the following page.

TABLE 2: CASE STUDY SCREENING RESULTS						
Project	**Land Use**	**Small Project**	**Low VMT Area**	**100% Affordable Residential**	**Local Serving Retail**	**Screening Outcome**
Case Study 1 - Stonegate	SFR Units	Fail	N/A	Fail	N/A	Fail
	MFR Units		N/A	Fail	N/A	Fail
	Commercial		N/A	N/A	Fail	Fail
	Park		N/A	N/A	N/A(1)	N/A
Case Study 2 - Ashlock-Garden Oak Estates	SFR Units	Fail	Fail	Fail	N/A	Fail
	MFR Units		Fail	Fail	N/A	Fail
	Commercial		N/A	N/A	Pass	Pass
Case Study 3 - Leen	SFR Units	Fail	Pass	Fail	N/A	Pass
Case Study 4 - Estates at Lindo Channel	SFR Units	Fail	Pass	Fail	N/A	Pass

Notes:
N/A = Not Applicable.
(1) A small local park may qualify as local serving and have the same beneficial VMT effects presumed for local serving retail.

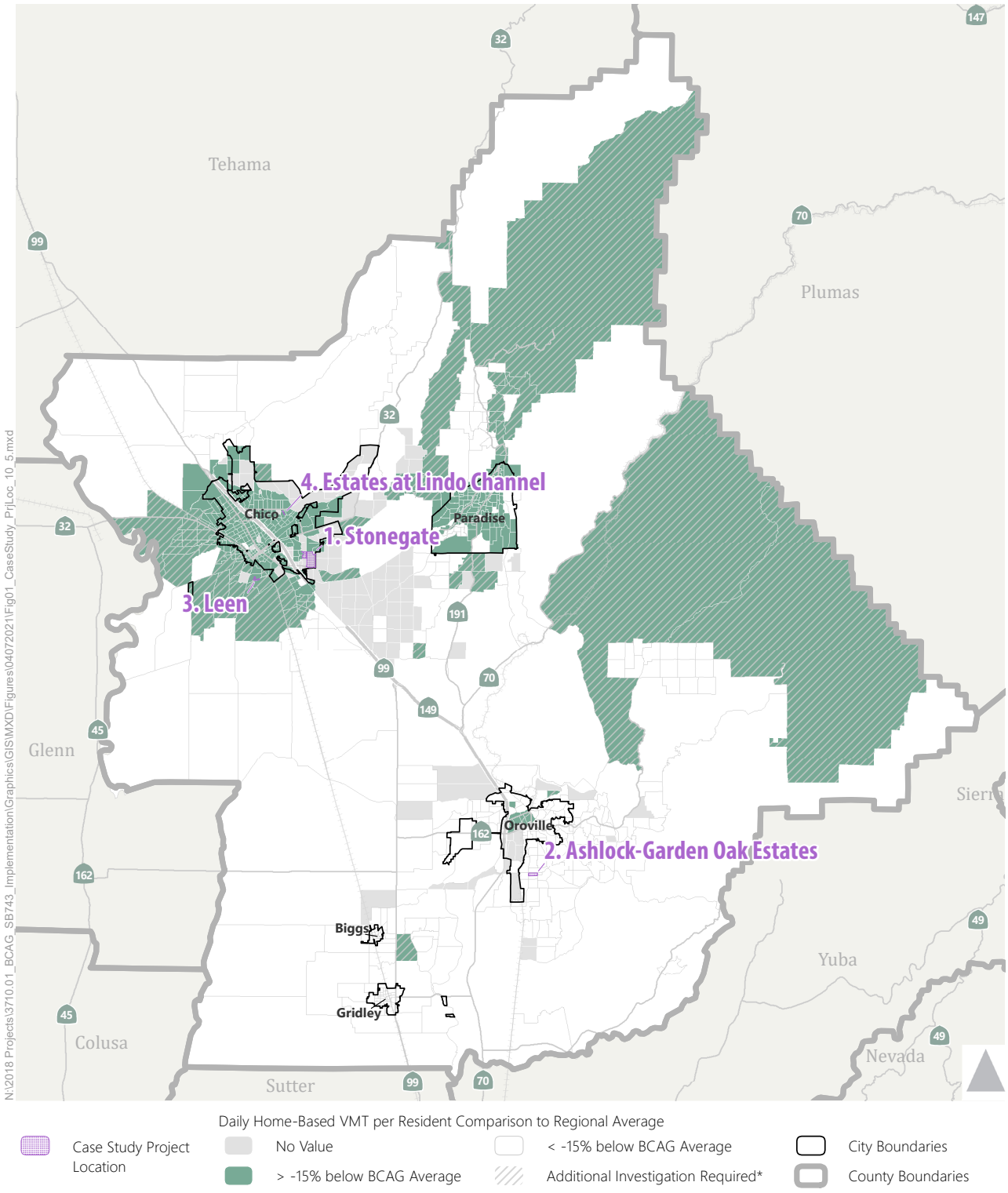


FIGURE 8: CASE STUDY PROJECT LOCATIONS COMPARED TO LOW VMT RESIDENTIAL ZONES

Source: Modified Version 1.1-3.17.21 of the BCAG RTP/SCS Model
**Area may not qualify for screening due to land use context.*

Key highlights of the screening outcome are discussed below.

- **Case Study 1 – Stonegate** failed each of the checklist items or they were not applicable largely due to the size of the project and its location. Screening is generally designed for smaller projects except 100 percent affordable housing projects.
- **Case Study 2 – Ashlock – Garden Oak Estates** had a similar outcome to Case Study 1, but its commercial uses could qualify as local serving retail based on their size and intended uses per the project description. A potential exception to this finding may occur if the proposed general plan land use designation and zoning for the commercial uses could allow for land uses that would be high VMT generating.
- **Case Study 3 – Leen and Case Study 4 – Estates at Lindo Channel** passed screening due to their locations in low VMT areas. Both locations benefit from the proximity to other uses in the Chico area.

For the projects that didn't pass screening, the first question is whether mitigation is available that could improve the VMT performance below the applicable screening threshold. As part of this BCAG SB 743 Implementation Study, a separate evaluation of mitigation strategies applicable to the Butte County land use and transportation context was prepared. That evaluation is a starting point for lead agencies. If sufficient mitigation is not identified, the next step in the process is to perform a complete VMT impact analysis as outlined in the next section.

PERFORMING A COMPLETE VMT IMPACT ANALYSIS

For case studies 1 and 2, a complete VMT impact analysis may be required (refer to process flowchart in executive summary). The final determination will be up to the lead agency. Their basic choices are either to identify the VMT impact as significant and unavoidable (SU) based on the screening assessment, which would require an EIR, or to perform a complete analysis that provides additional evidence about the project's VMT performance. The complete analysis will require more time and effort but could lead to better information about the nature of the VMT impact and help to identify effective mitigation measures. The complete analysis also provides VMT inputs that may be necessary for air quality, greenhouse gas (GHG), and energy impact analysis for the project.

If using VMT impact thresholds derived from a travel demand model (i.e., the modified version 1.1-3.17.21 of the BCAG RTP/SCS model), then a complete VMT impact analysis will be performed using the same model to ensure an apples-to-apples comparison between the threshold and the project's VMT performance. The model can be obtained from BCAG following the instructions at the website below.

- http://www.bcag.org/Planning/Transportation-Forecasting/index.html

Model applications for local land use projects are the responsibility of local lead agencies or their consultants. Applying the model will involve the following steps.

1. Review the model's static validation in the project study area. Identify whether any refinements are needed to improve the model's sensitivity in the project area or for the type of project being analyzed.
2. Make necessary refinements to the model identified in step 1, which may include adding a new traffic analysis zone (TAZ) to represent the project site. Adding a project specific TAZ simplifies the process for isolating model outputs for the project.
3. Update the model's input files to represent the project. This may include land use, demographic, socioeconomic, and transportation network input parameters.
4. Determine what scenarios are required for the environmental impact analysis. Typical scenarios could include the following.

    a. Baseline (see Methodology documentation for this study for more details)

    b. Baseline plus project

    c. Cumulative no project

    d. Cumulative plus project

    For the cumulative plus project scenario, care should be taken to accurately represent the project's land use effects. Most projects will not generate new population or employment growth under cumulative conditions. Instead, project land use changes associated with typical general plan amendments and rezones will affect land use supply and the allocation of growth. As such, the cumulative scenarios should use the same control totals for population and employment growth.
5. Run the model to produce VMT inputs for environmental impact analysis. Typical VMT metrics are shown below but the final ones selected will depend on the specific impact subjects required for the project. For example, air quality, GHG, and energy impact analysis will often rely on total VMT and total VMT generated by a project while transportation impacts rely on the other efficiency metric forms.

6. Compare the project's VMT performance to the applicable thresholds and determine impact significance. If a lead agency follows the Technical Advisory threshold recommendations, this will require comparing individual land use VMT performance against the applicable thresholds. For example, a mixed-use project consisting of residential and offices uses would use two separate VMT metrics. For the residential land use, the impact analysis would rely on the home-based VMT per resident metric above. The office use would apply the home-based work VMT per employee metric. Checking the cumulative plus project performance is important in this step. Some projects may perform worse than the threshold during screening or under baseline plus project conditions while generating lower levels of VMT under cumulative plus project conditions. This typically occurs when an area is planned for mixed-use development that has not yet matured. Over time, as development fills in and the mix of uses becomes more robust, VMT rates will decline.
7. If a significant VMT impact is identified, then mitigation measures should be developed similar to what was discussed above under the screening assessment. However, use of the model allows for more detailed testing of select VMT reduction strategies that influence the project site or surrounding area's built-environment.

Following these steps would be required for case studies 1 and 2 above and similar projects. In general, these will tend to be larger projects or projects with unique land uses not covered by screening. However, the rural and suburban land use context could result in even small to medium-sized projects having to perform complete VMT impact analysis for those lead agencies using the Technical Advisory thresholds.

TOTAL VMT

All vehicle-trips (i.e., passenger and commercial vehicles) or passenger only vehicle-trips are assigned on the network within a specific geographic boundary (i.e., model-wide, region-wide, city-wide). Vehicle volume on each link is multiplied by link distance.

TOTAL VMT GENERATED BY A PROJECT

All vehicle-trips are traced to the zone or zones of study. This includes internal to internal (II), internal to external (IX), and external to internal (XI) trips. May use final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims.

HOME BASED VMT PER RESIDENT

All automobile (i.e., passenger cars and light-duty trucks) vehicle-trips that start or end at the home are traced, but non-home-based trips made by residents elsewhere on the network are excluded.

HOME BASED WORK VMT PER EMPLOYEE

All automobile trips between home and work are traced.

06

Local Plan Policy Recommendations

Opportunities for CEQA Streamlining

BACKGROUND

As part of the BCAG SB 743 Implementation Study, the project team evaluated local plans including general plans and climate action plans to identify potential opportunities for streamlining VMT impact analysis as allowed by the CEQA Guidelines. The two most relevant streamlining opportunities found are those in CEQA Guidelines Sections 15183 and 15177[1].

> **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.

> **15177. SUBSEQUENT PROJECTS WITHIN THE SCOPE OF THE MEIR**
> (a) After a Master EIR has been prepared and certified, subsequent projects which the lead agency determines as being within the scope of the Master EIR will be subject to only limited environmental review.

The potential desire for streamlining was identified based on the current VMT performance of each jurisdiction in Butte County and the VMT impact significance threshold recommended in the T*echnical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory), California Governor's Office of Planning and Research (OPR), December 2018. The chart below shows home-based VMT per resident performance for each jurisdiction in Butte County compared against 15 percent below the regional average, which is a potential VMT impact significance threshold recommended in the OPR Technical Advisory. Incorporated cities could also choose to apply the 15 percent reduction at their jurisdictional level for residential projects.

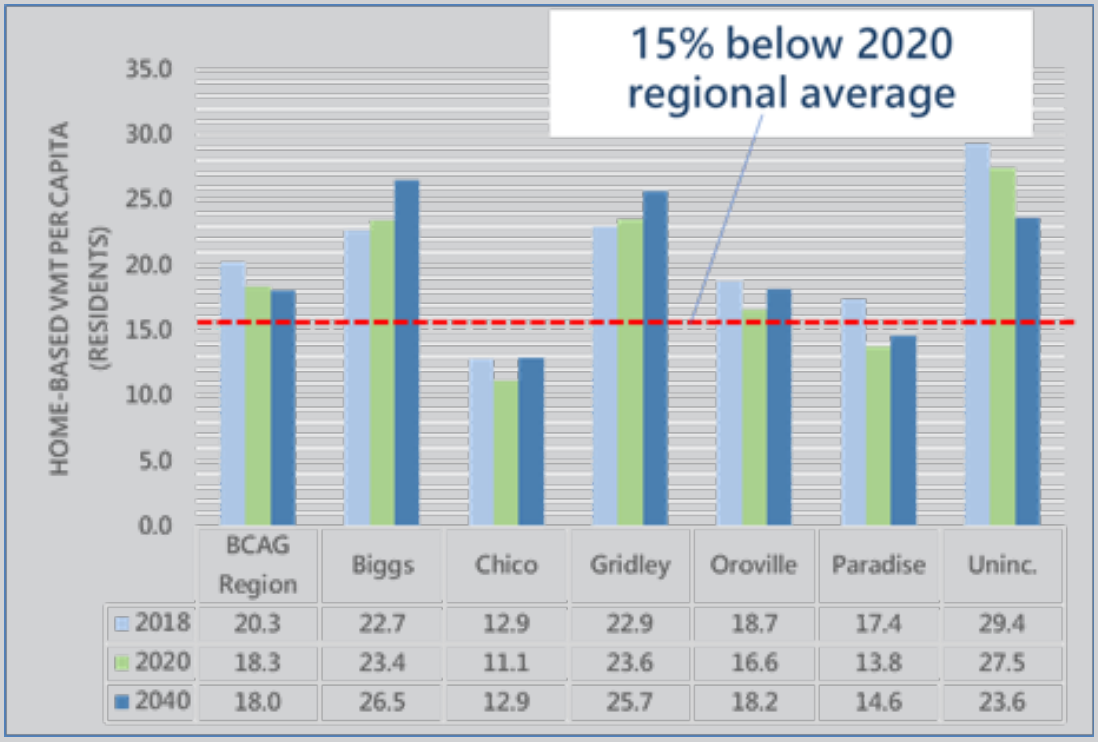
Using the regional threshold benchmark in the chart would likely result in most residential projects outside Chico and Paradise having significant VMT impacts. Mitigating VMT impacts in these lower density communities may also have limited feasibility, which would lead to significant and unavoidable impacts requiring the preparation of an environmental impact report (EIR). In the past, residential projects in these areas tended to have negative declarations (NDs) or mitigated negative declarations (MNDs). A shift to requiring EIRs for these projects would increase development review times and costs. Similar outcomes may occur for non-residential projects.

[1] Section 15182 is another option for streamlining like 15183 but applicable to specific plans.

PLAN AND POLICY ASSESSMENT

The plan and policy assessment performed for this study did not identify any current plans as having performed VMT impact analysis that would comply with current CEQA requirements (see table on page 71). Hence, individual land use projects cannot take advantage of potential CEQA streamlining without updates to these plans and new environmental reviews.

FIGURE 9: RESIDENTIAL VMT PERFORMANCE OF BUTTE COUNTY JURISDICTIONS



	BCAG Region	Biggs	Chico	Gridley	Oroville	Paradise	Uninc.
2018	20.3	22.7	12.9	22.9	18.7	17.4	29.4
2020	18.3	23.4	11.1	23.6	16.6	13.8	27.5
2040	18.0	26.5	12.9	25.7	18.2	14.6	23.6

OPPORTUNITIES FOR CEQA STREAMLINING

The general concept behind the CEQA streamlining provisions above is to address impacts at the 'plan level' while including sufficient detail in the impact analysis and mitigation to cover most subsequent 'projects' without having to conduct further analysis. The 15177 limits on subsequent reviews are more onerous than 15183 because they come with the requirement to use a master environmental impact report (MEIR). MEIRs have their own unique requirements in CEQA including updates every 5 years to retain their streamlining benefits.

For local general plans and their associated EIRs to provide the streamlining benefits available through Sections 15183 and 15177, some type of plan update would be required to trigger their discretionary review and CEQA compliance. At a minimum, the plans should address VMT performance expectations for the jurisdiction and integrate those expectations into goals and policies for the circulation element. When this approach is taken, it can affect other elements such as land use due to the internal consistency requirements for general plans. Changes may also be necessary for related climate action plans (CAPs) or greenhouse gas (GHG) reduction plans as noted below.

- General plans contain population and employment growth that will increase total VMT. This growth in VMT is a starting point for considering any further reduction in VMT or the rate of VMT generation. As shown in the chart of home-based VMT per resident above, current plans for most jurisdictions do not produce VMT levels that would avoid a significant VMT impact under CEQA. Reassessing this outcome in a general plan update may lead to better VMT performance. It would also provide evidence to determine the level of VMT reduction that is likely feasible in the jurisdiction to help inform expectations for subsequent land use projects.
- Mitigation for VMT impacts could trigger changes in the land use element. Creating more land use efficient urban development patterns is one of the more effective methods for reducing the need to travel by vehicle. When land uses are in close proximity, opportunities to walk and bicycle increase the effectiveness of transit increases.
- CAPs often contain embedded VMT reductions that are not transparent. Lead agencies setting VMT reduction expectations as part of SB 743 VMT impact thresholds should verify their consistency with GHG reduction goals.
- CEQA analysis of air quality, GHG, and energy impacts may also contain embedded VMT reduction expectations. Like CAPs, lead agencies should verify consistency of VMT reduction expectations across these technical areas.

Given the information above, local jurisdictions that want to rely on CEQA streamlining can do so through updates of their general plans (or development/ modification of community or specific plans) that include a new EIR analysis containing VMT impact analysis that complies with CEQA Guidelines Section 15064.3. Since VMT influences other general plan elements and environmental impact topics, any update to address VMT reduction expectations should be balanced against other competing objectives contained within the plan.

TABLE 3: ASSESSMENT OF VMT IMPACT ANALYSIS IN LOCAL JURISDICTION PLANS		
Jurisdiction	**Type of Plan**	**Did CEQA Review Include VMT Impact Analysis?**
Butte County	General Plan	No
Biggs	General Plan	No
Chico	General Plan	No
Gridley	General Plan	No
Oroville	General Plan	No
Paradise	General Plan	No

Notes:
(1) = This question is assessed based on CEQA Guidelines Section 15064.3.

07

Mitigation Strategies

This chapter summarizes an assessment of research related to VMT reduction strategies associated with changing the built environment and implementing TDM measures. The purpose of this work was to compile a list of potential VMT reduction mitigation measures for use in Butte County given its small city, small town, and rural land use context.

Assessing Feasibility

BACKGROUND

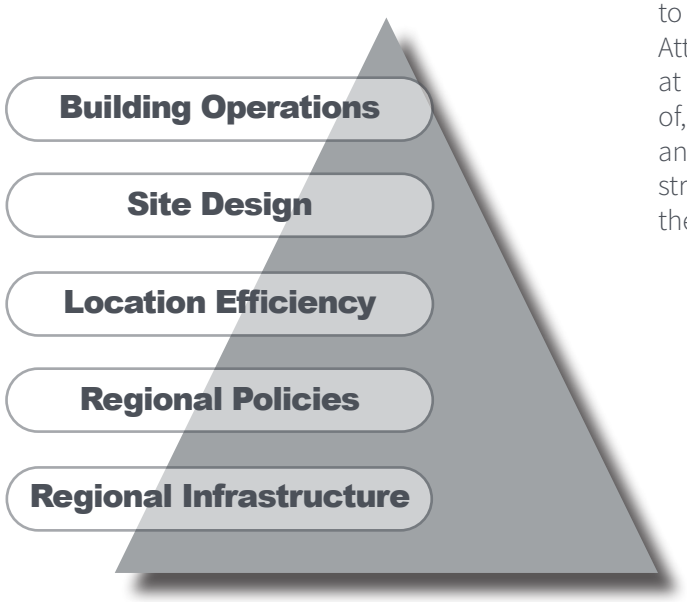
This technical document summarizes an assessment of research related to VMT reduction strategies associated with changing the built environment and implementing TDM measures. The purpose of this work was to compile a list of potential VMT reduction mitigation measures for use in Butte County given its small city, small town, and rural land use context. The specific approach was to build on the original research supporting VMT and greenhouse gas (GHG) mitigation contained in the Quantifying Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association (CAPCOA), August 2010. New academic research published since 2010 was reviewed to update the CAPCOA strategies and then each strategy was evaluated for potential application in Butte County based on potential effectiveness given the land use and transportation context.

The CAPCOA report is a primary resource for quantifiable VMT and GHG reduction that can be applied at the project, community, and even regional level although most of the strategies are targeted for individual land use projects. The transportation component includes 50 strategies that can be implemented independently or in combination. The strategies cover a wide range of measures, from increasing transit frequency to implementing road pricing to encouraging location-efficient land uses, as well as more traditional TDM measures like ride-sharing programs and parking cash-out. For each strategy, the report provides a fact sheet that summarizes the available literature on the strategy and provides a methodology for quantifying the strategy's effectiveness. The table in Attachment C summarizes the overall evaluation of all the CAPCOA strategies including which strategies are best suited for implementation in Butte County. Note that the CAPCOA report is being updated and a new version is anticipated for release later in 2021 so some changes in Attachment A may be warranted after its release.

STRATEGY REVIEW

The matrix in Appendix C summarizes the overall evaluation findings and provides a complete list of VMT reduction mitigation strategies based on the latest available research. An important consideration for the effectiveness of the TDM strategies contained in the matrix is the appropriate scale of implementation. The strategies described in this memorandum include regional, city, and community-scale transportation infrastructure strategies (for example, expanding the transit or bicycle network) and project-level strategies (for example, building site TDM strategies such as parking pricing and transit pass subsidies). The largest reductions in VMT (and resulting emissions) derive from regional and city policies related to land use location efficiency and infrastructure investments that support transit, walking, and biking. While there are many measures related to site design and building operations that can influence VMT, they typically have smaller effects that are often dependent on building tenants. Figure 10 presents a conceptual illustration of the relative importance of scale.

FIGURE 10: TRANSPORTATION-RELATED VMT/GHG REDUCTION MEASURES



Source: Fehr & Peers, 2021

Of the 50 transportation-related strategies presented in the CAPCOA 2010 report, three are vehicle strategies unrelated to VMT reduction. The remaining 47 strategies are listed in Attachment A. Forty-one of these strategies are applicable at the building and site level. The other six 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 4: SUMMARY OF TRANSPORTATION-RELATED CAPCOA MEASURES		
SCOPE	**AGENTS**	**CAPCOA STRATEGIES**
Building Operations	Employer, Manager	26 from five CAPCOA strategy groups: • 3 from 3.2 Site Enhancements group • 3 from 3.3 Parking Pricing Availability group • 15 from 3.4 Commute Trip Reduction group • 2 from 3.5 Transit Access group • 3 from 3.7 Vehicle Operations group
Site Design	Owner, Architect	15 from three strategy groups: • 6 from 3.1 Land Use group • 6 from 3.2 Site Enhancements group • 1 from 3.3 Parking group • 2 from 3.6 Road Access group
Location Efficiency	Developer, Local Agency	3 shared with Regional and Local Policies
Alignment with Regional and Local Policies	Regional and Local Agencies	3 shared with Location Efficiency

Source: Fehr & Peers, 2021

To identify the strategies appropriate for projects in Butte County, we followed the steps below to narrow the list.

1. Eliminated strategies for which the literature does not support a quantified and calculable reduction in VMT.
2. Eliminated strategies not appropriate outside a very urban land use context.
3. Separate strategies that apply at the community versus project scale.

This process produced 13 strategies out of the 47 strategies and are noted in the last column of Appendix A as those most likely to be effective in Butte County based on its rural, small town, or small city land use context. These strategies are described briefly on the following pages, with CAPCOA strategy numbers in parentheses. Note that disruptive trends, including but not limited to, COVID-19 responses, transportation network companies (TNCs), autonomous vehicles (AVs), internet shopping, and micro-transit may affect the future effectiveness of these strategies.

COMMUNITY-SCALE STRATEGIES

1. Provide pedestrian network improvements (3.2.1) – This strategy focuses on creating a pedestrian network within the project and connecting to nearby destinations. Projects in Butte County tend to be small 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 (discussed in more detail below) or benefit/assessment district targeted to various areas in the County designated for improvements through local or regional plans. Implementation of this strategy may require regional or local agency coordination and may not be applicable for all individual land use development projects.
2. Provide traffic calming measures and low-stress bicycle network improvements (3.2.2) – 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. 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. Implementation options are similar to strategy 2 above. Implementation of this strategy may require regional or local agency coordination and may not be applicable for all individual land use development projects.
3. Increase transit service frequency and speed (3.5.4) – This strategy focuses on improving transit service convenience and travel time competitiveness with driving. Given land use density in Butte County, this strategy may be limited to traditional commuter transit where trips can be pooled at the start and end locations or require new forms of demand-responsive transit service. The 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 by relying on TNC ride-hailing technology, using smaller vehicles sized to demand, and flexible driver employment terms where drivers are paid by trip versus by hour. Implementation of this strategy would require regional or local agency implementation and/or substantial changes to current transit practices, and therefore would not likely be applicable to individual development projects.
4. Implement car-sharing programs (3.4.9) – 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. Note that implementation of this strategy would require regional or local agency implementation and coordination.
5. Provide coordinated school pools (3.4.10) – This strategy helps families share in the responsibilities of getting kids to school and back via carpooling, walking, biking, or riding the school bus together. Effectiveness of this program depends on the extent to which resident schoolchildren are already walking, biking, and riding the school bus to school.

6. Increase diversity of land uses (3.1.3) – 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.
7. Provide ride-sharing program (3.4.3) – This strategy focuses on encouraging carpooling and vanpooling by project site/building tenants, which depends on the ultimate building tenants; this should be a factor in considering the potential VMT reduction.
8. Provide end of trip facilities (3.4.5) – This strategy involves providing end of trip bicycle facilities such as secure bicycle parking, lockers, and showers. Effectiveness tied to other supporting facilities and programs for bicycle use.
9. Implement subsidized or discounted transit program (3.4.4) – This strategy reduces the need to own a vehicle or reduces the number of vehicles owned by a household by incentivizing individuals to use transit for their daily commute. This strategy depends on the ultimate building tenants and may require monitoring. This strategy also relies on Butte Regional Transit continuing to provide similar or better service throughout the County, in terms of frequency and speed.
10. Encourage telecommuting and alternative work schedules (3.4.6) – 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 the nature of work done by tenants' employees (can the work be done remotely in the first place?); two factors that should be considered for potential VMT reduction. Effectiveness may also be limited in more rural areas of the County with limited broadband internet access.
11. Implement employer marketing of commute alternatives (3.4.7) – This strategy increases the effectiveness of commute trip reduction programs by requiring employers to market them directly to their employees. This strategy depends on the ultimate building tenants and may require monitoring.
12. Provide employer-sponsored vanpool/shuttle (3.4.11) – Employer-sponsored vanpools and shuttles provide a shared commute alternative to driving alone. The effectiveness of this strategy depends on the ultimate building tenants and may require monitoring.
13. Implement parking management (3.3.1 and 3.3.2) – Parking management strategies focus on the management of parking to influence vehicle travel. Free and ubiquitous parking supply tends to increase vehicle use while reducing parking supply and pricing spaces can help reduce vehicle travel. A reduction in parking supply can also be used to incentivize infill development and higher density development by reducing the cost of building parking spaces. These strategies may be less effective in suburban and rural settings such as Butte County but will depend on the specific project site and the surrounding parking supply.

Of these strategies, the most effective are those that would be implemented at the community scale and would likely require a program approach to implementation, such as an impact fee program, mitigation bank, or mitigation exchange. These approaches are discussed below. Project site mitigation effectiveness is more limited given the small number of travelers involved and the land use context.

LIMITATIONS OF QUANTIFICATION

To be effective mitigation measures, TDM strategies must have sufficient evidence to quantify the level of VMT reduction that a strategy could achieve for a given project site. In general, the TDM strategies can be quantified using CAPCOA calculation methodologies but there are some important limitations for project site applications and combining strategies as explained below.

PROJECT SITE APPLICATIONS

The density and mix of surrounding land uses, plus the quality of available transit service, are all examples of land use context factors that influence vehicle trip making. Therefore, the CAPCOA methodology identifies VMT reduction maximums based on community types tied to land use context. The caps are applied at each step of the VMT reduction calculation (at the strategy scale, the combined strategy scale, and the global scale). However, these caps are not based on research related to the effectiveness of VMT reduction strategies in different land use contexts. Instead, the percentages were derived from a limited comparison of aggregate citywide VMT performance for Sebastopol, San Rafael, and San Mateo, where VMT performance ranged from 0 to 17 percent below the statewide VMT/capita average based on data collected prior to 2002. Little to no evidence exists about the long-term performance of similar TDM strategies in different land use contexts. Therefore, VMT reductions from TDM strategies have limited confidence.

COMBINING VMT REDUCTION STRATEGIES

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. To quantify the VMT reduction that results from combining strategies, the formula below can be applied absent additional knowledge or information:

Total VMT Reduction=(1-P_a)*(1-P_b)*(1-P_c)*…

where

P_$_x$=*percent reduction of each VMT reduction strategy*

This adjustment methodology is a mathematical approach to dampening the potential effectiveness and is not supported by research related to the actual effectiveness of combined strategies. The intent of including this formula is to provide a mechanism for dampening to minimize the potential to overstate the VMT reduction effectiveness. Analysts should consider the available substantial evidence at the time a study is prepared to determine the most appropriate approach for California Environmental Quality Act (CEQA) review.

LIMITATIONS FOR IMPLEMENTATION

Physical project site TDM strategies often involve increasing land use density, changing the mix of uses, or altering the transportation network. However, a potential limitation of these physical design changes is that they may result in a project that no longer resembles the original applicant submittal. CEQA is intended to disclose the potential impacts of a project and mitigate those impacts but has limitations with regards to using mitigation to fundamentally change the project. Therefore, these strategies may result in an inconsistency with the project description when applied on an ad hoc basis.

Another common strategy is to add a TDM program to the project as a condition of approval. While evidence exists that TDM programs can reduce VMT, their success depends on the performance of future building tenants that can change over time. Hence, an effective TDM mitigation program will require ongoing monitoring and adjustment to ensure long-term VMT reduction is achieved. The cost to provide this monitoring may not be feasible for all projects. Without monitoring to ensure effectiveness, significant VMT impacts may remain significant and unavoidable.

ADDRESSING LIMITATIONS

In response to the limitations of focusing exclusively on project site TDM strategies, new mitigation concepts are emerging that cover larger areas and rely on region- or city-scale programs to achieve VMT reductions. These program-based concepts are outlined below. As with all VMT mitigation, these programs require substantial evidence to demonstrate that the projects included in the programs would achieve the expected VMT reductions. Additionally, the discretionary action to adopt the program may require CEQA review.

- **VMT Impact Fee Program** – This concept resembles a traditional impact fee program in compliance with the mitigation fee act and uses VMT as a metric. 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 main difference from a fee program based on a metric such as vehicle 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. To date, the Cities of Los Angeles, Orange, and San Diego have adopted VMT impact fee programs.

- **VMT Exchanges** – This concept (along with VMT banks) borrows mitigation approaches from other environmental analysis such as wetlands. The concept relies on a developer agreeing to implement a predetermined VMT-reducing project or proposing a new one in exchange for the ability to develop a VMT-generating project. The mitigation projects may or may not be located near the developer's project site. The concept requires a facilitating entity (such as the lead agency) to match the VMT generator (the development project) with the VMT-reducing project and ensure through substantial evidence that the VMT reduction is valid. Another requirement is a determination of the necessary time period to demonstrate a VMT reduction. For example, how many years of VMT reduction are required to declare a VMT impact less than significant? A final requirement is that mitigation projects would not have otherwise occurred without the Exchange, which is a condition known as "additionality." No exchanges have been created yet but the City of Los Angeles in collaboration with Metro and the Southern California Association of Governments (SCAG) is evaluating a pilot concept based on developers purchasing student transit passes from Metro

- **VMT Banks –** This concept attempts to create a monetary value for VMT reduction (for example, credits) 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. This program is more complicated than an exchange and would require more time and effort to set up and implement. It would include the requirements above for an exchange, such as mitigation time periods and additionality determinations, while also tackling the unique challenge of estimating how much VMT reduction is associated with each credit and whether this value would change over time based on mitigation performance and new mitigation offerings. ." No banks have been created yet but the City of Los Angeles pilot noted above is also considering a bank option.

Table 5 compares the pros and cons of these three programs. Although implementation of these programs would require an upfront cost, they have several advantages over project site TDM strategies.

- CEQA streamlining – These programs provide a funding mechanism for project mitigation and may require less project-site monitoring to demonstrate that significant impacts are reduced to a less-than-significant level. Additionally, projects could be screened from completing a quantitative VMT analysis; or, if a quantitative VMT analysis is required, the cost would be somewhat less than the cost for analyzing LOS impacts.
- Greater VMT reduction potential – Since these programs coordinate citywide land use and transportation projects, they have the potential to result in greater VMT reduction potential than site-level TDM strategies applied on a project-by-project basis. Additionally, these programs expand the amount of feasible mitigation for reducing VMT impacts. A wider range of feasible VMT reduction measures may reveal some measures that can reduce VMT more cost-effectively than site-level mitigations alone.
- Legal compliance – The VMT reduction programs can help build a case for a nexus between a VMT impact and funding for capital improvement programs.

However, program-based approaches also have at least one disadvantage: they may lead to increased development costs by introducing additional feasible mitigation measures. Adding impact mitigation costs to suburban and rural housing projects may be counter to lead agency land use diversity and adequate/affordable housing goals.

TABLE 5: VMT MITIGATION PROGRAM TYPE COMPARISON		
PROGRAM TYPE	**PROS**	**CONS**
Impact Fee Program	• Common and accepted practice • Accepted for CEQA mitigation • Adds certainty to development costs • Allows for regional scale mitigation projects • Increases potential VMT reduction compared to project site mitigation only	• Time consuming and expensive to maintain • Requires clear nexus between CIP projects and VMT reduction • Increases mitigation costs for developers because it increases feasible mitigation options
Mitigation Exchange	• Limited complexity • Reduced nexus obligation • Expands mitigation to include costs for programs, operations, and maintenance • Allows for mitigation projects to be in other jurisdictions • Allosw for regional scale mitigation projects • Increases potential VMT reduction compared to project site mitigation only	• Requires additionality • Potential for mismatch between mitigation need (project site) and mitigation project location • Increases mitigation costs for developers because it increases feasible mitigation options • Unknown timeframe for mitigation life
Mitigation Bank	• Adds certainty to development costs • Allows for regional scale projects • Allows for mitigation projects to be in other jurisdictions • Allso regional or state transfers • Expands mitigation options to inlcude costs for programs, operations, and maintenance • Increases potential VMT reduction compared to project site mitigation only	• Requires additionality • Time consuming and expensive to develop and maintain • Requires strong nexus • Political difficulty distributing mitigation dollars/projects • Increases mitigation costs for developers because it increases feasible mitigation options • Unknown timeframe for mitigation life

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Appendices

Appendix A
Lead Agency Decision Matrix

Lead Agency Decisions	BCAG Member Agency Options	Common Limitations	Considerations
What form of the VMT Metric?	1 Total VMT 2 Total VMT per service population[1] 3 Home-based VMT per resident 4 Home-based work VMT per employee	Metrics other than total VMT and total VMT per service population represent only 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.	Include all forms of VMT needed for screening and complete analysis (this includes total VMT by speed bin for air quality, GHG, and energy impact analysis). The minimum set of metrics are listed below. 1 Total VMT (by speed bin) 2 Home-based VMT per resident 3 Home-based work VMT per employee As an option, Total VMT per service population can be added for land use plans and when an agency is willing to use a travel demand model for all project analysis.
What methodology to use in estimating and forecasting VMT?	1 Caltrans Statewide Travel Demand Model 2 BCAG RTP/SCS travel demand model 3 Local travel demand model 4 Sketch planning tool or spreadsheet[2]	Statewide and regional models have limited sensitivity and accuracy for local scale applications off the shelf. Sensitivity verification is required within the study area prior to project analysis. The BCAG model has already performed some VMT sensitivity analysis. It will also include adjustments as part of this implementation project to account for trip lengths beyond the model boundary. Sketch and spreadsheet tools do not capture the 'project effect on VMT'.	Use regional or local models after calibrating and validating for local project scale sensitivity/accuracy and appending trip length data for trips with external trip ends. Use these models to analyze both 'project generated VMT' and 'project effect on VMT'. Land use projects only change land supply. As such, the analysis of project effect should recognize this condition.

Appendix A
Lead Agency Decision Matrix

Lead Agency Decisions	BCAG Member Agency Options	Common Limitations	Considerations
Is use of VMT impact screening per 15064.3 desired?[3]	Projects that reduce VMT or are located within transit priority areas (TPAs) should be presumed to have a less than significant impact on VMT.	Screening does not provide information about the actual VMT changes associated with the project.	Rely on screening if consistent with applicable general plan and supported by substantial evidence.
What is the VMT impact significance threshold for land use projects under baseline conditions?	1 Lead agency discretion consistent with general plan and expectations for 'project scale' VMT reductions not accounted for in general plan EIR and supported by substantial evidence. 2 OPR 15% below baseline average for a city or region (automobiles only)[4] 3 ARB 14.3% below baseline (2015-2018) average of jurisdiction (all vehicles) 4 ARB 16.8% below baseline (2015-2018) average of jurisdiction (automobiles only) 5 Any increase above baseline total for the study area or jurisdiction (all vehicles)	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. No evidence provided in OPR, ARB, or Caltrans guidance to support treating land use and transportation projects differently when it comes to threshold expectations. Transportation and retail land use projects are subject to a threshold where any increase in total VMT causes a significant impact whereas residential and office land use projects only have impacts when their VMT generation rates are not at least 15% lower than existing land uses.	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 considering other general plan and community objectives. Translating state goals into VMT thresholds should carefully 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 agencies per CEQA Guidelines Section 15064.7 but should support this decision with substantial evidence.

Appendix A
Lead Agency Decision Matrix

Lead Agency Decisions	BCAG Member Agency Options	Common Limitations	Considerations
What is the VMT impact significance threshold for land use projects under cumulative conditions?	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 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 general plan objectives especially those related to air pollution and GHG reduction.	Uncertainty of VMT trends makes a cumulative impact finding less certain. 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. Re-allocation of growth for cumulative analysis is new to practitioners and complicated.	Analyze the project's effect on land supply and VMT using an appropriate valid model. For impact findings, consider all available substantial evidence including *2018 Progress Report, California's Sustainable Communities and Climate Protection Act*, November 2018, CARB and current research on the long-term effects of transportation network companies (TNCs), new mobility options, and autonomous vehicles (AVs). Specific research examples include Fehr & Peers AV effect model testing.
What is the VMT impact significant threshold for transportation projects under baseline conditions?	VMT applies to transit, active transportation, and other transportation projects. For roadway capacity projects, the CEQA Guidelines Section 15064.3(b)(2) grants lead agencies the discretion to choose their own metrics and thresholds. OPR and Caltrans recommend the use of VMT for all transportation projects and to treat projects that do not increase baseline VMT to be presumed to have a less than significant impact.	Continued use of LOS for roadway capacity 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.	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.

Appendix A
Lead Agency Decision Matrix

Lead Agency Decisions	BCAG Member Agency Options	Common Limitations	Considerations
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. This document is currently being updated by CAPCOA with expected publication in 2021.	Built environment strategies require modifying the project, which may create inconsistencies with the project description and financial feasibility. Many TDM strategies are building tenant dependent so their use requires on-going monitoring and adjusting to account for changes in 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 (see City of Los Angeles example). 2 In-lieu fee program for VMT reducing actions. 3 VMT mitigation bank or exchange program. 4 TDM ordinance applying to all employers (and potentially new residents).

Notes:

(1) Service population includes population plus employment and may include students or visitors; it should include all independent variables that generate trips.

(2) This method has limitations if using a citywide or regional average for a threshold.

(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.

(4) The OPR threshold was not developed through analytical or scientific study. It reflects OPR advice after reviewing various planning studies and state goals documented in the *Technical Advisory*. ARB used the OPR 15% threshold as an input to their threshold guidance and assumed that California statewide VMT would be 15% lower by 2050 compared to the 2015-2018 average. VMT from other sources (e.g., visitors and commercial driving) were not included in the ARB analysis. ARB's analysis does not consider the 2019 update to statewide population forecasts, which reduced California's population by about 5 million by 2050 nor the long-term influence of transportation network companies, internet shopping, work from home changes, new mobility options, or autonomous vehicles.

(5) Caltrans endorses the OPR Technical Advisory thresholds for intergovernmental review (IGR) purposes. Local jurisdictions should consider whether state agency recommendations constitute 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.

APPENDIX B

Sketch Planning Tool Assessment

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. The OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* contains the following specification for models and methodologies.

> *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.*

Given the above, the sketch models are not appropriate for VMT impact analysis. Therefore, the focus of this assessment is on the strength of the tools for VMT mitigation testing. To the extent that these tools are currently being used by lead agencies for VMT analysis related to air quality or GHG impacts, other limitations of the tools may be important to note as highlighted in reviews by UC Davis and UC Berkeley.[1]

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.

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).

[1] Specific Citations:
Amy Lee, Kevin Fang, and Susan Handy; "Evaluation of Sketch-Level Vehicle Miles Traveled (VMT) Quantification Tools," National Center for Sustainable Transportation, August 2017.

Elisa Barbour, Dan Chatman, Sarah Doggett, Stella Yip, and Manuel Santana; "SB 743 implementation: Challenges and Opportunities [Draft Final]," June 5, 2018.

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.

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 various 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.

The matrix below provides a summary of the tool review related to VMT mitigation testing.

Sketch Tool	Output	Includes VMT Mitigation Testing?	Strength of Evidence Supporting VMT Estimates and Mitigation Reductions
CalEEMod	VMT	Yes	Limited. Relies on *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, 2010, which is currently undergoing an update. The tool does not differentiate between VMT reduction strategies that are appropriate at the community versus project scale and does not consider whether strategies have sufficient evidence for CEQA application.
Sketch 7	% Change in VMT	No	Not applicable.
VMT Impact Tool/Salon	% Change in VMT	No	Not applicable.
GreenTRIP Connect	VMT; Change in VMT	Yes	Limited. Includes affordable housing and TDM credit for 4 strategies but lacks sufficient evidence for CEQA application.
UrbanFootprint	VMT	Yes	Limited. No TDM reduction but land use changes can be tested (e.g., density and diversity of uses).
Envision Tomorrow	VMT	No	Not applicable.
CA Smart Growth Tool	Trips	No	Not applicable.
TRIMMS	VMT	Yes	Limited. Includes a variety of TDM strategies but research support is often prior to 2010 and the tool does not differentiate between VMT reduction strategies that are appropriate at the community versus project scale and does not consider whether strategies have sufficient evidence for CEQA application.
MXD+	Trips; VMT	Yes	Limited. No TDM reduction but land use changes can be tested (e.g., density and diversity of uses)
VMT+	VMT	No	Not applicable.
TDM+	% Change in VMT	Yes	Robust. Relies on *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, 2010 but limits strategies to those applicable at the project scale and with sufficient evidence for CEQA application.

						New Information Since CAPCOA Was Published in 2010			
CAPCOA Category	**CAPCOA #**	**CAPCOA Strategy**	**CAPCOA Reduction**	**Strength of Evidence for CEQA**	**Applicable for Individual Projects?**	**New information**	**Updated VMT reduction (1)**	**Literature or Evidence Cited**	**Consider for Butte County Mitigation?**
Land Use/Location	3.1.1	LUT-1 Increase Density	0.8% - 30% VMT reduction due to increase in density	Adequate	Yes - however, the project must increase residential or employment density by at least 10%.	Increasing residential density is associated with lower VMT per capita. Increased residential density in areas with high jobs access may have a greater VMT change than increases in regions with lower jobs access. The range of reductions is based on a range of elasticities from -0.04 to -0.22. The low end of the reductions represents a -0.04 elasticity of demand in response to a 10% increase in residential units or employment density and a -0.22 elasticity in response to 50% increase to residential/employment density.	0.4% -10.75%	Primary sources: Boarnet, M. and Handy, S. (2014). Impacts of Residential Density on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Stevens, M. (2017). Does Compact Development Make People Drive Less? Journal of the American Planning Association, 83(1), 7-18.	No - Applicable only when density exceeds 7 dwelling units per acre
Land Use/Location	3.1.2	LUT-2 Increase Location Efficiency	10% - 65% VMT reduction due to increase in location efficiency	Adequate	No	Rarely feasible to change the location of an individual land use project. May be applicable for land use plans at the city or larger area.	Elasticity -0.05 to -0.25 VMT percent reduction per 1 percent increase in regional accessibility	Primary source: Handy, S. et al. (2013) Impacts of Regional Accessibility Based on a Review of the Empirical Literature - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	No - Not applicable to individual land use projects
Land Use/ Location	3.1.3	LUT-3 Increase Diversity of Urban and Suburban Developments	9%-30% VMT reduction due to mixing land uses within a single development	Adequate	Yes	1] VMT reduction due to mix of land uses within a single development. Mixing land uses within a single development can decrease VMT (and resulting GHG emissions), since building users do not need to drive to meet all of their needs. 2] Reduction in VMT due to regional change in entropy index of diversity. Providing a mix of land uses within a single neighborhood can decrease VMT (and resulting GHG emissions), since trips between land use types are shorter and may be accommodated by non-auto modes of transport.	1] 0%-12% 2] 0.3%-4%	1] Ewing, R. and Cervero, R. (2010). Travel and the Built Environment - A Meta-Analysis. Journal of the American Planning Association,76(3),265-294. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf 2] Zhang, Wengia et al. "Short- and Long-Term Effects of Land Use on Reducing Personal Vehicle Miles of Travel."	Yes
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	Yes	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. Rarely feasible to change the location of an indivdiual land use project. May be applicable for land use plans at the city or larger area.	0.5%-12%	Primary sources: Handy, S. et al. (2014). Impacts of Network Connectivity on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Handy, S. et al. (2013). Impacts of Regional Accessibility on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Holtzclaw, et al. (2002.) Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and Chicago. Transportation Planning and Technology, Vol. 25, pp. 1–27.	No - Requires relocating the project
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	Yes - the project must include the TOD design features.	1] VMT reduction when transit station is provided within 1/2 mile of development (compared to VMT for sites located outside 1/2 mile radius of transit). Locating high density development within 1/2 mile of transit will facilitate the use of transit by people traveling to or from the Project site. The use of transit results in a mode shift and therefore reduced VMT. 2] Reduction in vehicle trips due to implementing TOD. A project with a residential/commercial center designed around a rail or bus station, is called a transit-	1] 0%-5.8% 2] 0%-7.3%	1] Lund, H. et al. (2004). Travel Characteristics of Transit-Oriented Development in California. Oakland, CA: Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans. 2] Zamir, K. R. et al. (2014). Effects of Transit-Oriented Development on Trip Generation, Distribution, and Mode Share in Washington, D.C., and Baltimore, Maryland. Transportation Research Record: Journal of the Transportation Research Board. 2413, 45–53. DOI: 10.3141/2413-05	No - Applicable only in urban contexts with high quality transit

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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.	Potentially yes - the use of this strategy would need to be supported by local data.	Observed trip generation indicates substantial local and regional variation in trip making behavior at affordable housing sites. Recommend use of ITE rates or local data for senior housing	N/A	"Draft Memorandum: Infill and Complete Streets Study, Task 2.1: Local Trip Generation Study." *Measuring the Miles: Developing new metrics for vehicle travel in LA.* City of Los Angeles. April 19, 2017.	No - Lack of evidence
Land Use/ Location	3.1.7	LUT-7 - Orient Project Toward Non-Auto Corridor	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Land Use/ Location	3.1.8	LUT-8 Locate Project Near Bike Path/Bike Lane	Insufficient evidence for CEQA mitigation						No - Lack of evidence
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	Potentially yes - scale of the project is key factor.	No update to CAPCOA literature; advise applying CAPCOA measure only to large developments with significant internal street structure.	Same	N/A	No - Applicable only in specific contexts
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	No - Current research supports city and neighborhood level VMT reductions only.	VMT reduction due to provision of complete pedestrian networks. Only applies if located in an area that may be prone to having a less robust sidewalk network.	0.5%-5.7%	Handy, S. et al. (2014). Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	Yes
Neighborhood Site Enhancements	3.2.2	SDT-2 Provide Traffic Calming Measures	0.25%-1% VMT reduction due to traffic calming on streets within and around the development	Adequate	Potentially yes - Research includes numerous land use and network conditions that must be met.	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.	0%-1.7%	Zahabi, S. et al. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. Transportation Research Part D: Transport and Environment. 47, 89-103.	Yes
Neighborhood Site Enhancements	3.2.3	SDT-3 Implement an NEV Network	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.4	SDT-4 Urban Non-Motorized Zones	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.5	SDT-5 Incorporate Bike Lane Street Design (on-site)	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.6	SDT-6 Provide Bike Parking in Non-Residential Projects	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.7	SDT-7 Provide Bike Parking in Multi-Unit Residential Projects	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.8	SDT-8 Provide EV Parking	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Neighborhood Site Enhancements	3.2.9	SDT-9 Dedicate Lane for Bike Trails	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Parking Pricing	3.3.1	PDT-1 Limit Parking Supply	5%-12.5% VMT reduction in response to reduced parking supply vs. ITE parking generation rate	Weak - not recommended in current form. See new evidence.	Yes	VMT reduction occurs in residential areas where convenience of transit use is high and where nearby parking is also limited.	0-13.7%	California Department of Transportation (Caltrans). 2012. California Household Travel Survey (CHTS). Available: https://www.nrel.gov/transportation/secure-transportation-data/tsdccalifornia-travel-survey.html. Accessed: January 2021 Chatman, D. 2013. Does TOD need the T? On the importance of factors other than rail access." Journal of the American Planning Association 79, no. 1. Available: https://trid.trb.org/view/1243004 . Accessed:	No - Applicable only in specific contexts
Parking Pricing	3.3.2	PDT-2 Unbundle Parking Costs from Property Cost	2.6% -13% VMT reduction due to decreased vehicle ownership rates	Adequate - conditional on the agency not requiring parking minimums and pricing/managing on-street parking (i.e., residential parking permit districts, etc.).	Yes - however, the project must be in a location that does not require parking minimums and has priced or permitting on-street parking.	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).	0-13.3%	Victoria Transport Policy Institute (2020). Parking Requirement Impacts on Housing Affordability. Retrieved January 2021 from: http://www.vtpi.org/park-hou.pdf.	Yes

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Parking Pricing	3.3.3	PDT-3 Implement Market Price Public Parking	2.8%-5.5% VMT reduction due to "park once" behavior and disincentive to driving	Adequate	Yes - however, the VMT reductions would only apply to visitor or customer trips.	Implement a pricing strategy for parking by pricing all central business district/employment center/retail center on-street parking. It will be priced to encourage "park once" behavior. The benefit of this measure above that of paid parking at the project only is that it deters parking spillover from project supplied parking to other public parking nearby, which undermine the vehicle miles traveled (VMT) benefits of project pricing. It may also generate sufficient area-wide mode shifts to justify increased transit service to the area.	0-30.0%	Pierce, G., Shoup, D. 2013. Getting the Prices Right: An Evaluation of Pricing Parking by Demand in San Francisco. Journal of the American Planning Association, 79(1), 67-81. May. Available: https://www.tandfonline.com/doi/pdf/10.1080/01944363.2013.787307?needAccess=true. Accessed: January 2021.	No - Applicable only in specific contexts
Parking Pricing	3.3.4	PDT-4 Require Residential Area Parking Permits	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Commute Trip Reduction	3.4.1	TRT-1 Implement CTR Program - Voluntary	1.0%-6.2% commute VMT reduction due to employer-based mode shift program	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-2 Implement CTR Program - Required Implementation/Monitoring" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.	Yes - however, the effectiveness of a voluntary CTR program would be building tenant specific and may require monitoring to evaluate the program's effectiveness.	Reduction in vehicle trips in response to employer-led TDM programs. The CTR program should include all of the following to apply the effectiveness reported by the literature: • Carpooling encouragement • Ride-matching assistance • Preferential carpool parking • Flexible work schedules for carpools • Half time transportation coordinator • Vanpool assistance • Bicycle end-trip facilities (parking, showers	1.0%-6.0%	Boarnet, M. et al. (2014). Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	No - Applicable only in urban contexts with substantial congestion.
Commute Trip Reduction	3.4.2	TRT-2 Implement CTR Program - Required Implementation/Monitoring	4.2%-21.0% commute VMT reduction due to employer-based mode shift program with required monitoring and reporting	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.	Yes - however, the effectiveness of a CTR program would be building tenant specific and may require monitoring to evaluate the program's effectiveness.	Limited evidence available. Anecdotal evidence shows high investment produces high VMT/vehicle trip reductions at employment sites with monitoring requirements and specific targets.	Same	Nelson/Nygaard (2008). South San Francisco Mode Share and Parking Report for Genentech, Inc.(p. 8) Cited in: California Air Pollution Control Officers Association. (2010). Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf	No - Applicable only in urban contexts with substantial congestion.
Commute Trip Reduction	3.4.3	TRT-3 Provide Ride-Sharing Programs	1%-15% commute VMT reduction due to employer ride share coordination and facilities	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Yes - however, the effectiveness of the ride-sharing programs is building tenant specific and may require monitoring to evaluate the program's effectiveness.	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	2.5%-8.3%	Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm	Yes
Commute Trip Reduction	3.4.4	TRT-4 Implement Subsidized or Discounted Transit Program	0.3%-20% commute VMT reduction due to transit subsidy of up to $6/day	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Yes	1] Reduction in vehicle trips in response to reduced cost of transit use, assuming that 10-50% of new bus trips replace vehicle trips; 2] Reduction in commute trip VMT due to employee benefits that include transit 3] Reduction in all vehicle trips due to reduced transit fares system-wide, assuming 25% of new transit trips would have been vehicle trips.	1] 0.3%-14% 2] 0-16% 3] 0.1% to 6.9%	1] Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm 2] Carolina, P. et al. (2016). Do Employee Commuter Benefits Increase Transit Ridership? Evidence rom the NY-NJ Region. Washington, DC: Transportation Research Board, 96th Annual Meeting. 3] Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.ht	Yes
Commute Trip Reduction	3.4.5	TRT-5 Provide End of Trip Facilities	Limited effect if implemented alone. Preferred grouping with TRT-1 and TRT-2 to reduce commute VMT.	Adequate - Effectiveness is building/tenant specific.	Yes	End of trip facilities are associated with higher levels of bicycling to work compared to locations with no facilities.	0.1-4.4%	Buehler, R. 2012. Determinants of bicycle commuting in the Washington, DC region: The role bicycle parking, cyclist showers, and free car parking at work. Transportation Research Part D, 17, 525–531. Available: http://www.pedbikeinfo.org/cms/downloads/DeterminantsofBicycleCommuting.pdf.	Yes

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Commute Trip Reduction	3.4.6	TRT-6 Encourage Telecommuting and Alternative Work Schedules	0.07%-5.5% commute VMT reduction due to reduced commute trips	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Yes	VMT reduction due to adoption of telecommuting. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks.	0.2%-4.5%	Handy, S. et al. (2013). Policy Brief on the Impacts of Telecommuting Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/telecommuting/telecommuting_brief120313.pdf	Yes
Commute Trip Reduction	3.4.7	1] TRT-7 Implement CTR Marketing 2] Launch Targeted Behavioral Interventions	0.8%-4.0% commute VMT reduction due to employer marketing of alternatives	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Yes	1] Vehicle trips reduction due to CTR marketing; 2] Reduction in VMT from institutional trips due to targeted behavioral intervention programs	1] 0.9% to 26% 2] 1%-6%	1] Pratt, Dick. Personal communication regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies. Transit Cooperative Research Program. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf 2] Brown, A. and Ralph, K. (2017.) "The Right Time and Place to Change Travel Behavior: An Experimental Study." Washington, DC: Transportation Research Board, 2017 Annual Meeting. Retrieved from: https://trid.trb.org/view.aspx?id=1437253	Yes
Commute Trip Reduction	3.4.8	TRT-8 Implement Preferential Parking Permit Program	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Commute Trip Reduction	3.4.9	TRT-9 Implement Car-Sharing Program	0.4% - 0.7% VMT reduction due to lower vehicle ownership rates and general shift to non-driving modes	Adequate	No - this strategy would require local and/or regional agency coordination to implement.	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, reducing need to own a vehicle. This contributes to greater use of transit and active transportation for more routine trips.	0.3%-1.6%	Lovejoy, K. et al. (2013). Impacts of Carsharing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm.	Yes
Commute Trip Reduction	3.4.10	TRT-10 Implement a School Pool Program	7.2%-15.8% reduction in school VMT due to school pool implementation	Adequate - School VMT only.	Not applicable, unless if the project being evaluated is a school.	Limited new evidence available, not conclusive	Same	Transportation Demand Management Institute of the Association for Commuter Transportation. TDM Case Studies and Commuter Testimonials. Prepared for the US EPA. 1997. (p. 10, 36-38) WayToGo 2015 Annual Report. Accessed on March 12, 2017 from http://www.waytogo.org/sites/default/files/attachments/waytogo-annual-report-2015.pdf	Yes
Commute Trip Reduction	3.4.11	TRT-11 Provide Employer-Sponsored Vanpool/Shuttle	0.3%-13.4% commute VMT reduction due to employer-sponsored vanpool and/or shuttle service	Adequate - Effectiveness is building/tenant specific.	Yes	1] Reduction in commute vehicle trips due to implementing employer-sponsored vanpool and shuttle programs; 2] Reduction in commute vehicle trips due to vanpool incentive programs; 3] Reduction in commute vehicle trips due to employer shuttle programs	1] 0.5%-5.0% 2] 0.3%-7.4% 3] 1.4%-6.8%	1] Concas, Sisinnio, Winters, Philip, Wambalaba, Francis, (2005). Fare Pricing Elasticity, Subsidies, and Demand for Vanpool Services. Transportation Research Record: Journal of the Transportation Research Board, 1924, pp 215-223. 2] Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm 3] ICF. (2014). GHG Impacts for Commuter Shuttles Pilot Program.	Yes
Commute Trip Reduction	3.4.12	TRT-12 Implement Bike-Sharing Programs	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Commute Trip Reduction	3.4.13	TRT-13 Implement School Bus Program	38%-63% reduction in school VMT due to school bus service implementation	Adequate - School VMT only.	Not applicable, unless the project being evaluated is a school.	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.	5%-30%	Wilson, E., et al. (2007). The implications of school choice on travel behavior and environmental emissions. Transportation Research Part D: Transport and Environment 12(2007), 506-518.	No - Not applicable to individual land use projects

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Commute Trip Reduction	3.4.14	TRT-14 Price Workplace Parking	0.1%-19.7% commute VMT reduction due to mode shift	Adequate - Effectiveness is building/tenant specific.	Yes	Reduction in commute vehicle trips due to priced workplace parking; effectiveness depends on availability of alternative modes. Workplace parking pricing may include: explicitly charging for parking, implementing above market rate pricing, validating parking only for invited guests, not providing employee parking and transportation allowances, and educating employees about available alternatives.	0.5%-14%	Primary sources: Concas, S. and Nayak, N. (2012), A Meta-Analysis of Parking Price Elasticity. Washington, DC: Transportation Research Board, 2012 Annual Meeting. Dale, S. et al. (2016). Evaluating the Impact of a Workplace Parking Levy on Local Traffic Congestion: The Case of Nottingham UK. Washington, DC: Transportation Research Board, 96th Annual Meeting. Secondary sources: Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Spears, S. et al. (2014). Impacts of Parking Pricing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	No - Applicable only in specific contexts
Commute Trip Reduction	3.4.15	TRT-15 Employee Parking Cash-Out	0.6%-7.7% commute VMT reduction due to implementing employee parking cash-out	Weak - Effectiveness is building/tenant specific. Research data is over 10 years old (1997).	Yes	Shoup case studies indicate a reduction in commute vehicle trips due to implementing cash-out without implementing other trip-reduction strategies.	3%-7.7%	Shoup, D. (1997). Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies. Transport Policy. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/research/apr/past/93-308a.pdf. This citation was listed as an	No - Applicable only in specific contexts
Transit System	3.5.1	TST-1 Provide a Bus Rapid Transit System	0.02%-3.2% VMT reduction by converting standard bus system to BRT system	Adequate	No - the conversion of standard bus system to BRT would require local and/or regional agency coordination to implement	No new information identified.	Same	N/A	No - Not applicable to individual land use projects
Transit System	3.5.2	TST-2 Implement Transit Access Improvements	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Transit System	3.5.3	TST-3 Expand Transit Network	0.1-8.2% VMT reduction in response to increase in transit network coverage	Adequate	No - expanding the transit network would require local and/or regional agency coordination to implement.	Reduction in vehicle trips due to increased transit service hours or coverage. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.1%-10.5%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	No - Not applicable to individual land use projects
Transit System	3.5.4	TST-4 Increase Transit Service Frequency or Speed	0.02%-2.5% VMT reduction due to reduced headways and increased speed and reliability	Adequate	No - increasing the quality of transit service would require local and/or regional agency coordination to implement.	Reduction in vehicle trips due to increased transit frequency/decreased headway. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.3%-6.3%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	Yes
Transit System	3.5.5	TST-5 Provide Bike Parking Near Transit	Insufficient evidence for CEQA mitigation						No - Lack of evidence
Transit System	3.5.6	TST-6 Provide Local Shuttles	Insufficient evidence for CEQA mitigation						No - Lack of evidence

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Road Pricing/ Management	3.6.1	RPT-1 Implement Area or Cordon Pricing	7.9-22.0% VMT reduction	Weak - Evidence is from other countries and does not apply to individual land use projects.	No - Only applies in central business district or urban center.	Traffic volume reductions substantiated for toll projects in the U.S. Increasing prices for VMT would likely reduce VMT.	Same	Boarnet, M. et al. (2014) Impacts of Road User Pricing on Passenger Vehicle Use and Greenhouse Gas Emissions, Policy Brief and Technical Background Report. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Cambridge Systematics. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute. (p. B-13, B-14) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf o Referencing: VTPI, Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior. July 2008. www.vtpi.org	No - Not applicable to individual land use projects
Road Pricing/ Management	3.6.2	RPT-2 Improve Traffic Flow	0-45% reduction in GHG emissions	Weak - Research does not look at individual land use projects	No - improving traffic flow would require local and/or regional agency coordination to implement	No new information identified.			No - Not applicable to individual land use projects
Road Pricing/ Management	3.6.3	RPT-3 Require Project Contributions to Transportation Infrastructure Improvement Projects	NA - Grouped Strategy	Weak - Research does not look at individual land use projects	May be applicable if a larger VMT mitigation exchange or bank program has been established on a City- or region-wide level.	No new information identified.			No - Not applicable to individual land use projects
Road Pricing/ Management	3.6.4	RPT-4 Install Park-and-Ride Lots	Insufficient evidence for CEQA mitigation						No - Lack of evidence

NOTES:
(1) For specific VMT reduction ranges, refer to the cited literature.