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STAFF REPORT

Date: January 20, 2021

To: TRPA Regional Plan Implementation Committee

From: TRPA Staff

Subject: Discussion and Possible Direction on Amending the Existing Nitrate Deposition Threshold Standard (AQ14) to a Per Capita Vehicle Miles Traveled Standard to Reduce Reliance on the Automobile, Reduce Greenhouse Gas Emissions, and Promote Mobility; and Discussion and Possible Direction on Implementing Mechanisms to Accelerate Attainment of the Vehicle Miles Traveled Standard Including Revisions to the Transportation Project Impact Assessment and Air Quality Mitigation Fee of TRPA Code Section 65.2, and Amendments to the Goals and Policies of the Regional Plan

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Summary and Staff Recommendation:

In July 2020, the Regional Plan Implementation Committee directed staff to meet with the Transportation Technical Advisory Committee (TTAC) to obtain input on the Vehicle Miles Traveled ("VMT") threshold update and the associated Project Impact Assessment (PIA) which is used as one of mechanisms to implement (i.e., attain and maintain) the threshold standard. Staff met with the TTAC through December 2020 to obtain input and generate this proposal for updating the VMT threshold standard and PIA approach. This staff report sets out the recommended general approach that will be used to create a final package for RPIC review and recommendation at a future meeting. This item is for discussion and possible direction.

Required Motions:

In order to provide the direction needed, the Committee should make the following motion, based on the staff report:

> A motion directing staff to finalize development of the Per Capita VMT standard, implementing Goals and Policies, and the revisions to the Project Impact Assessment and Air Quality Mitigation Fee as discussed in this staff report.

In order for the motion to pass, an affirmative vote of a majority of the quorum of the committee is required.

Project Description/Background:

This proposal includes an update to the existing Nitrate Deposition VMT threshold standard and project impact assessment approach.

VMT Threshold Standard Update Summary: The proposed update to the VMT threshold standard changes the unit of measurement from total VMT to VMT per capita. It includes both the desired outcome of a 6.8% reduction by 2045 and target reductions for interim periods. It reflects the contemporary approach to threshold standards recommended by the Tahoe Science Council and

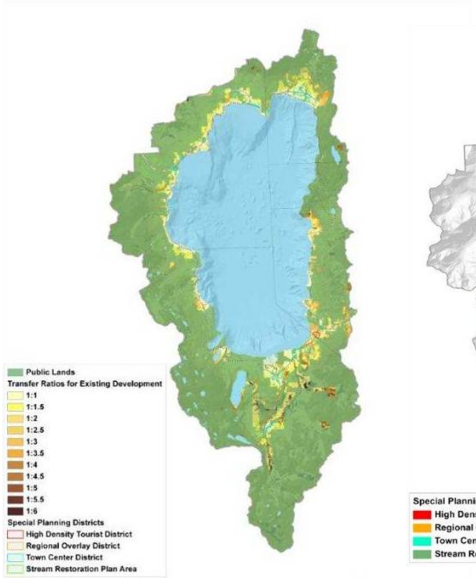
accepted by the TRPA Governing Board's Threshold Update Initiative Stakeholder Working Group, including desired outcome, the use of SMART (Specific, Measurable, Attainable, Relevant, and Timebound) goals, and identification of implementation and monitoring components as part of an adaptive management system. It aligns with current climate and transportation policies of both states, as well as those reflected in both the Regional Plan and Regional Transportation Plan. The proposal and its components (e.g., how VMT and population are measured, etc.) are described in detail in Attachment A (VMT Threshold Update: Target Setting and Implementation). Key components of the proposal, highlighted briefly below, relate to greenhouse gas reduction, reduced auto dependency, the land use and development pattern, and a Regional Plan amendment.

Greenhouse Gas Reduction Component: In addition to recognizing that the extra-regional growth that drives VMT levels in the basin cannot be controlled unilaterally by TRPA, the per capita approach is consistent with the per capita GHG reduction requirement to which the Tahoe MPO is subject per the California Air Resources Board. California metropolitan planning organizations (MPOs) are subject to the California Air Resources Board (CARB) per capita GHG reduction targets for passenger vehicles as well as sustainable communities strategy (SCS) requirements intended to create more compact development and meet affordable housing needs. The Tahoe MPO per capita GHG reduction target for 2035 is 5% below the 2005 level. TRPA with its unique combination of land use and transportation planning authority, is well positioned to meet this reduction goal, as well as reduce auto dependency, create a more compact development pattern and meet affordable housing needs.

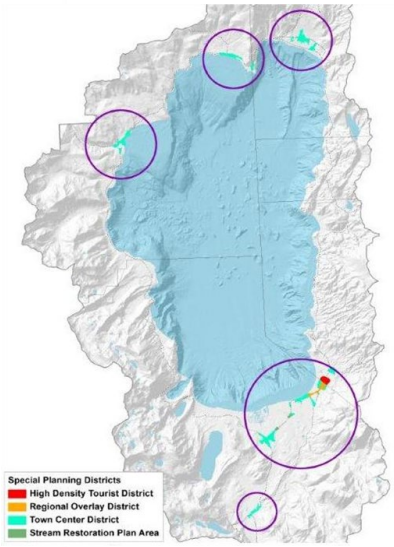
Reduced Auto Dependency Component: The proposed threshold standard recognizes this Bi-State Compact objective by targeting a reduction in VMT per capita. Roadway capacity in Tahoe is limited (i.e., new roads or lanes are unlikely due to geographic and environmental constraints) so increasing mobility requires a transportation system that improves connectivity and mobility through implementing new trails and transit service, adaptive corridor management with transit priority and/or reversible travel lanes, and parking management. VMT per capita more directly measures auto dependency than total VMT.

Land Use and Development Pattern Component: Higher density, mixed use development reduces per capita vehicle miles traveled and better utilizes and supports transit service (Richard M. Haughey 2005; Bochner & Sperry 2010; Ewing et al. 2011; Walters et al. 2013). The 2012 amendments to the Regional Plan increased transfer ratios for relocating remote (auto-reliant) development into town centers with existing and planned transit service. The most recent versions of the Regional Transportation Plan/Sustainable Communities Strategy (i.e., 2017 and 2020) emphasize reducing auto travel demand by encouraging non-auto travel and by providing alternative modes of transportation. Both the Regional Plan and Regional Transportation Plan/Sustainable Communities Strategy are consistent with these underlying concepts and work in a complementary fashion to address many of the Region's goals as shown in the maps on the next page which are from the most recent adopted versions of those plans.

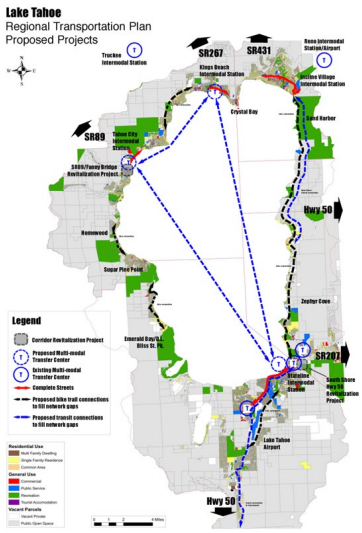
Development Rights Sending Areas and Transfer Ratios



Centers and Development Rights Receiving Areas



Proposed Transportation Projects



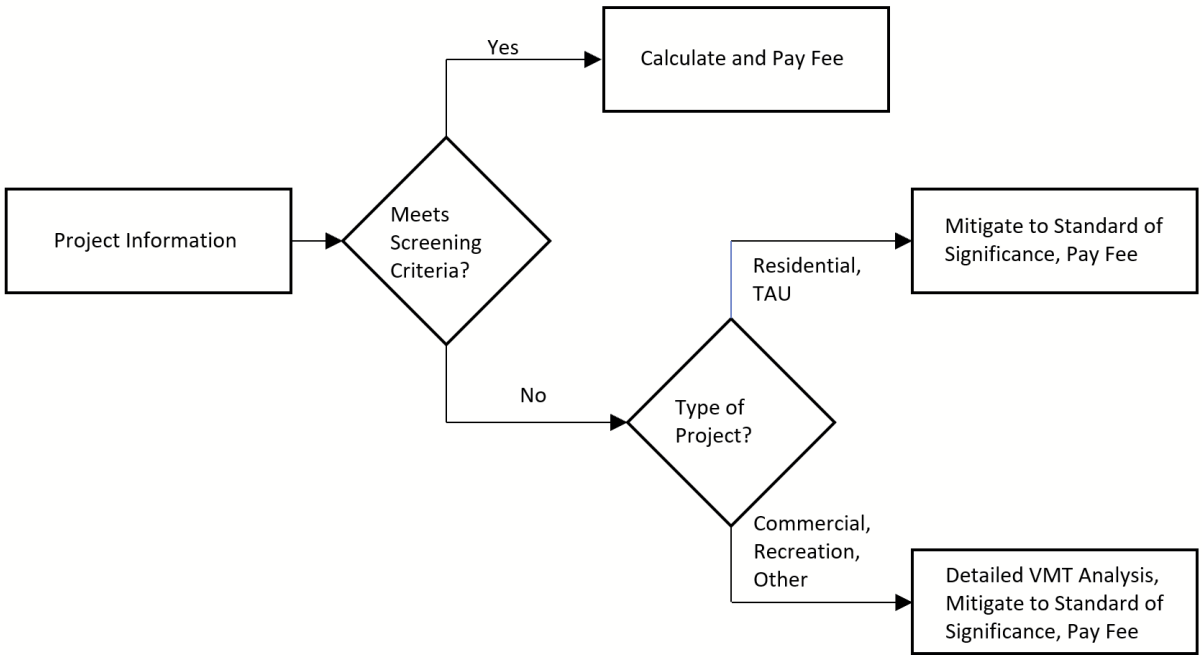
Regional Plan Amendment: To implement and facilitate attaining and maintaining the per capita VMT threshold standard, an amendment to the Regional Plan Goals and Polices is proposed. The proposed amendment adds a new goal in the Development and Implementation Priorities sub-element and six associated policies. The amendment includes a suite of actions to achieve the new VMT reduction standard that include:

- Establishing a technical advisory body to provide guidance on attaining and maintaining the new threshold standard
- Requiring the technical advisory body to prepare and transmit to the TRPA and TMPO governing boards a regular report including past performance, findings, and recommendations
- Establishing a schedule of milestones to measure progress towards the per capita VMT reduction goal
- Implementing identified adaptive management responses if scheduled milestones are not met
- Obtaining regional funding sources for transportation projects and programs per scheduled milestones

Project Impact Assessment Summary: Although new development will only account for about 7% of the total development in the Region as it is approaching buildout, the new threshold standard policy objectives (i.e., greenhouse gas reduction, reduced auto dependency, and land use and development pattern) and the conversion to VMT per capita as the appropriate measure require that the current method for assessing the transportation and air quality impacts of a proposed project and mitigation fee be updated as well. The proposed Project Impact Assessment (PIA) framework for this update is presented in more detail in Attachment B (Project Impact Assessment and Fee Framework). Consistent with previous RPIC direction, TRPA has been working closely with Placer County as they have developed their updated VMT thresholds for California Environmental Quality Act (CEQA) transportation impact

assessments as required by SB 743. Attachment C (Placer County Board of Supervisors December 1, 2020 Memorandum re: Vehicle Miles Traveled Thresholds for California Environmental Quality Act) provides a description of the work they have completed to date including coordination with TRPA. Key components of the proposed changes to the TRPA project impact assessment include process improvements, providing an online tool, screening criteria, environmental analysis standards of significance, fee update, and monitoring. These components are described briefly below.

Process Improvements: The improvements to the process include addition of an online tool, screening of projects that reflect important planning other objectives (e.g., location consistent with development pattern and land use objectives, affordable housing, etc.), consistent identification of the VMT levels required for different types of projects, and computation of fees. These were identified in coordination with Placer County as they developed their project assessment approach and their consultant (Fehr & Peers) who was partially funded by TRPA for TRPA products, and is based in large part on research and guidance provided by the California Office of Planning Research. The proposed revised process is illustrated in the following figure.



Online Tool: The use of online project assessment tools is a best practice used in jurisdictions across the nation. TRPA Governing Board members have seen demonstrations of similar online PIA tools that are in use in both Colorado and Southern California. Fehr & Peers is under contract to create this tool once all the parameters are known. The tool will use data from the TRPA Travel Demand Model to evaluate a project for transportation impacts. The tool will allow applicants to test alternatives before submitting an application, and will result in greater consistency for all parties. The tool and its documentation will be available online for applicants and the general public to use.

Screening Criteria: Screening criteria are based on the size, general location, and project type. The main goals of the screening criteria are to streamline VMT impact assessment for projects that meet important planning goals (e.g., location consistent with development pattern and land use objectives, affordable housing, etc.) and to remove the requirement for projects demonstrated to have a less than significant impact to transportation (i.e., produce low VMT). The proposed screening criteria (see

Screening Criteria Table in Attachment B for detail) reflect current criteria based on trips and were developed with input from the Transportation Technical Advisory Committee, stakeholder and consultant input, informed by extensive research on practices in other jurisdictions, and review of relevant California Office of Planning and Research guidance documents (see Attachment D: Review of Screening Criteria for Vehicle Miles Traveled).

Three project types will be exempt from either approach:

- Single-family residences on an existing lot because they are determined to be exempt from the preparation of an environmental document (Per existing 3.2.2.A.1 of the TRPA Code of Ordinances)
- Affordable housing that is 100% deed-restricted affordable, moderate, or achievable housing and is in an area eligible for affordable housing bonus units because data demonstrates an association between lower VMT rates and lower household incomes.
- Transportation projects involving active transportation or transit because these classes of projects will likely not lead to a substantial or measurable increase in VMT. Transportation projects that will be screened from additional review also include projects and amendments to plans that enhance bicycle, pedestrian, and transit service.

Standards of Significance: Projects that are not screened from further review will be evaluated by land use type. This will be accomplished using standards of significance developed with input from the Transportation Technical Advisory Committee, stakeholder and consultant input, and review of relevant California Office of Planning and Research guidance documents (see Standards of Significance Table in Attachment B for detail) . Residential and tourist accommodation unit projects will be evaluated by the PIA tool and required to mitigate their impacts to below the standards of significance (e.g., to 85% of VMT for existing similarly situated development) and pay the mobility mitigation fee. Non-screened commercial, recreation, and other projects will be required to perform a detailed VMT analysis using either the TRPA Model or a pre-approved detailed analysis, mitigate their impacts to or below the standards of significance (e.g., no net increase in VMT for retail projects), and pay the mobility mitigation fee, if applicable.

Fee Update: The maximum possible per VMT fee amount will be determined using the rough proportionality and nexus concepts and will be calculated using the cost of regionally significant projects identified in the adopted RTP constrained project list that address new VMT in the region and the projected future VMT contributed by new development. The VMT generated will be calculated by the tool based on the project type, size, and location. Projects that cannot reduce VMT to at or below the corresponding standard of significance will be required to pay a higher rate fee for all unmitigated VMT. The higher rate fee will be set to reflect the cost of mitigating the additional VMT plus administrative and contingency costs. It is anticipated that the updated program will collect roughly the same amount of fees as the existing AQM fee program.

Monitoring: Approaches to monitoring VMT mitigations are evolving. The National Center for Sustainable Transportation at the University of California, Davis is initiating a project to develop recommendations for monitoring VMT impacts and assessing the efficacy of VMT reduction strategies at the project level. Staff have been working with this research team on a parallel effort: VMT Measurement in the Tahoe Region. The development of project impact assessment VMT mitigation monitoring will be informed by both of these efforts as they develop over time.

Adoption of the new PIA approach requires changes to the TRPA Code of Ordinances. A draft of those changes will be presented at a future RPIC meeting.

Analysis: This proposal aligns with the 2020 Regional Transportation Plan (RTP) update and contemporary transportation and climate policies from both states: California's AB 32, SB 375, and SB 742 and Nevada's climate plan goals. When implemented it will result in achievements over and above those state policies with an effective goal for Tahoe of near zero growth in total VMT over the next 25 years and anchors success to securing new sources of transportation funding and implementing interim goals of the RTP. The success of this proposal depends on the success of other related and ongoing transportation planning and policy work. The Tahoe Region is poised to bring its transportation system into the 21st Century with an updated 2020 Regional Transportation Plan (RTP), updated implementation tools and funding, and new coalitions of implementing partners.

The groundwork for these achievements has been developing for at least a decade. This effort started with the major amendments to the Regional Plan and update of the Regional Transportation Plan eight years ago in 2012, resulting in the first comprehensive update of the Region's land use vision in 25 years. The 2012 Regional Plan amendments strengthened development policies and implementation incentives to spur compact, walkable, and bikeable community centers that favor reduced traffic and affordable and workforce housing near transit to reduce VMT and use of the auto.

The 2012 Plan incorporated important state policies that integrate land use and transportation projects, effectively the California state policies of AB 32 (greenhouse gas reduction) and SB 375 (linking land use and transportation planning to limit VMT growth). Tahoe's 2012 Regional Plan amendments put teeth behind those land use and & transportation policies, because TRPA is the only MPO whose Regional Plan incorporates an enforceable system of growth control, a system that's been in place for 40 years where all development in the Tahoe Region is capped. Practically speaking, unlike other areas of California and Nevada, Tahoe is effectively not growing because it is nearly at buildout, with little to no new development within the Region. What little development occurs is metered out slowly at about 130 units per year through limited remaining housing allocations. Much development in the Region is either redevelopment of existing buildings or transfers of development.

A further refinement of the land use incentives for compact, walkable, bikeable communities came in 2015 with revisions to TRPA's development rights system. All development types in Tahoe remain capped but now can be converted from one use to another more readily to better achieve the mixed use that is the foundation for creating sustainable communities, where housing can be located in proximity to community services and alternative modes of travel. These 2012 and 2015 Regional Plan changes are the land use strategies preventing excessive growth in regional VMT.

As the Tahoe Region's MPO, TRPA is charged with transportation planning for the Region and producing an updated RTP every four years, as well as overseeing RTP funding and implementation. Today's proposals come to the Committee because of three independently initiated actions related to our transportation role that are now converging and that must be harmonized and aligned to work together.

The first set of actions grew out of policy consultation between the two states to establish Tahoe's highest priority transportation needs and new funding sources to implement those priorities. As the 2016 RTP was being completed, the two states, through the California Resources Agency and Nevada Department of Conservation and Natural Resources, convened a transportation policy forum to clarify project priorities and transportation funding for Tahoe. The states brought public and private, federal, state, and local stakeholders together to identify and align on Tahoe's highest transportation implementation priorities that could make the most difference in reducing reliance on auto (i.e., accelerate implementation of SB 375 and contribute to the AB 32 goals of reducing GHG emissions from mobile sources). That policy consultation grew out of a growing set of pressures on Tahoe's transportation system and quality of life. The consultation acknowledged the Tahoe Region's greatest

transportation challenge – out of basin visitation traffic that clogs basin roads at peak times. Out-of-basin visitation is 50% of Tahoe's in-basin VMT and that visitation is primarily not within the Region's control. Public transportation projects in the RTP are the best means to manage that out of basin visitation pressure, through adding transit and alternative modes like bike and pedestrian trails, parking management, travel technology, or walkable bikeable town center redevelopment.

A second convening of the bi-state transportation consulting parties is now underway and has made new sources of funding to implement the RTP its highest priority. A target has been set to reach a widely supported bi-state and stakeholder consensus on an approach to new funding sources for transportation system implementation by the end of 2021.

The second related action of significance for today's proposals is the next 4-year update of the Tahoe's RTP. The 2020 RTP update is ready for consideration and approval. It reiterates and strengthens transportation strategies designed to address visitation congestion, reduce auto reliance, and implement state climate, land use, and transportation policy in AB32, Nevada's Climate Plan, as well as CA SB 375 policies.

The third related action to bring Tahoe's land use and transportation systems current is the proposal under development to update regional threshold standards. Tahoe has a set of environmental standards that is 40 years old, with many only remotely grounded in the most current science, circumstances, or policy. In 2015, the TRPA Governing Board identified updating the threshold standards as a high priority for the Region. The Board directed staff to work with the newly established bi-state Tahoe Science Advisory Council to develop an updated system of measures grounded in best practices. At that time (2015), the Governing Board selected the update of a dated air quality standard for nitrogen emissions (the existing "VMT standard") among the top priorities. Those nitrogen emissions were measured as a maximum amount of VMT because in the 1980s automobile tailpipe emissions contributed the most NOx to the atmosphere and the Lake. The Region achieved the NOx emissions reductions 20 years ago and the Region has remained in compliance with regional NOx emissions standard ever since, with levels continuing to decrease. Some have asked whether nitrogen deposition is still a concern. Further and since the Clean Water Act was amended in the 1990s, the Region has substituted the current and adopted TMDL as the primary regulatory strategy to control nutrient (including nitrogen) deposition to the Lake. However, the total VMT standard is still in place.

For years, stakeholders have used that VMT standard as an indirect and poor proxy for the effectiveness and efficiency of the Region's transportation system. The problem is that it is not anchored to any present-day reality about Tahoe's land use or transportation systems. Notably, this air quality threshold standard was never set to measure the success of our transportation system. But today it is still being applied as though it was set as a transportation threshold. It is not now and has never been related to or scientifically tied in any way to the implementation of Tahoe's RTP. Therefore, three years ago TRPA started work on updating the current VMT standard in a way that converted it from an air quality standard to control atmospheric nitrogen emissions to a standard that would tie to our RTP, its accelerated implementation, as well as the contemporary transportation, sustainable communities, and GHG reduction policies of the states.

The proposal before the RPIC is a new threshold standard that, together with the 2020 RTP Update, will not only encompass these contemporary and current state policies and approaches -- AB 32, SB 375, and now SB 743 -- but also achieve implementation over and above state policy because the goal it sets for the Tahoe Region is effectively "zero growth of total VMT " and reduced per capita VMT over the next 25 years. California allows growth in VMT, so Tahoe's proposal is a more aggressive goal than the State of California has adopted for itself. Tahoe achieves this by anchoring to implementation of interim RTP

project and program targets as the most effective means of controlling the growth of regional VMT and reducing VMT per capita, rather than looking solely to development restrictions as we do today. As a practical matter, population growth is occurring all around Tahoe, and this growth will place upward pressure on in-basin per capita VMT through increased recreation visitation from outside the region. The 2020 RTP plan is designed to limit that VMT growth to near zero, a more progressive policy than any other California and Nevada MPO or region.

A few stakeholder advocates have suggested the Tahoe Region place an absolute cap on regional VMT on the assumption that capping VMT is the best means to control development in Tahoe. The current VMT standard purports to control VMT by stopping release of residential allocations when the transportation model shows that the Region is exceeding the 1981 VMT standard. Because the Region is nearly built out under the Regional Plan's growth management system, development in Tahoe accounts for a miniscule portion of total VMT.

The most effect on VMT comes from funding the transportation programs and projects of the RTP -- transit, trails, technology, parking management, and other forms of transportation demand management-- all the programs and projects not directly connected to development projects but that come from public commitment of funding for transportation system infrastructure and operations.

The proposed update to a more relevant VMT standard tied directly to the implementation and funding of our RTP is designed around strategies, which if implemented, will result in nearly zero growth of VMT and is fully consistent, and even more progressive, than related statewide policies (AB 32, SB375, SB743, and Nevada's Climate Plan goals) require. The bi-state transportation consultation reconvened in 2019 is looking at new ways of funding the highest RTP priorities that would make the biggest difference to per capita VMT. And our VMT threshold update proposal ties to this Bi-state funding initiative, ties to interim implementation goals of the updated RTP, ties to state land use and transportation policy objectives for creating sustainable communities, and would bring Tahoe's transportation and land use systems up to date with the needs of the 21st Century.

Issues and Concerns:

As discussed above, this proposal encompasses much needed improvements to the current VMT threshold standard due to new scientific information, contemporary policies, and a new more comprehensive approach to setting and implementing threshold standards. It also includes a Regional Plan amendment and framework for updating the project impact assessment and fee used as one of the implementing mechanisms. This is part of a larger package designed to improve the transportation system and environment in the Lake Tahoe Region. Significant input has been received since this was last discussed at the RPIC in July, 2020, through three public TTAC meetings as well as multiple meetings with various stakeholders. As with any proposed change, there will be issues and concerns raised that some stakeholders feel have not been adequately addressed or should be addressed differently. Before preparing the necessary Code of Ordinances amendment, updates to the Rules of Procedure reflecting the updated transportation improvement projects and new fee, the required environmental documentation, the monitoring approach and any other components of the final package for RPIC consideration at a future meeting, staff is requesting that the RPIC consider any additional input, discuss this proposal, and provide staff direction.

Environmental Review:

The required environmental documentation will be provided in conjunction with the final package for RPIC review and recommendation at a future meeting.

Contact Information:
For questions regarding the VMT Threshold Standard and Regional Plan amendment please contact Dan Segan at (775) 589-5233 or dsegan@trpa.org. For questions on the project impact assessment and fee update please contact Melanie Sloan at (775) 589-5208 or msloan@trpa.org.

Attachments:
A. VMT Threshold Update: Standard Recommendation and Implementation
B. Project Impact Assessment and Fee Framework
   B.1 Travel Demand Model Assessment
   B.2 VMT Mitigations
C. Placer County December 1, 2020 Memorandum to Board of Supervisors from Ken Grehm and Steve Pedretti re: Vehicle Miles Traveled Thresholds for California Environmental Quality Act (Senate Bill 743)
D. TRPA December 31, 2020 Memorandum to Melanie Sloan from Michael Conger re: Review of Screening Criteria for Vehicle Miles Traveled

Attachment A

VMT Threshold Update: Standard Recommendation and Implementation

TAHOE REGIONAL PLANNING AGENCY

Threshold Update

VMT THRESHOLD UPDATE: STANDARD RECOMMENDATION AND IMPLEMENTATION

THRESHOLD UPDATE INITIATIVE

VERSION 1.1

JANUARY 20, 2021

REGIONAL PLAN IMPLEMENTATION COMMITTEE
AGENDA ITEM NO. 5 & 6

CONTENTS

SUMMARY OF RECOMMENDATIONS

Staff seeks Regional Plan Implementation Committee guidance on the recommended threshold standard.

Recommendation: Establish a establish a threshold standard of “A 6.8% reduction in per capita VMT from the 2018 baseline by 2045” to reduce reliance on the automobile, support GHG emission reduction, and increase mobility.

BACKGROUND

TRPA operates under the authority of the states of California and Nevada and the federal government through the Bi-State Compact, which was ratified by Congress and signed by the President of the United States. The revised Bi-State Compact, signed nearly forty years ago, wrote “the waters of Lake Tahoe and other resources of the region are threatened with deterioration or degeneration, which endangers the natural beauty and economic productivity of the region.(96th Congress 1980)” To ensure the natural beauty and economic productivity of the region would persist for generations to come, the Bi-State Compact directs TRPA to establish “environmental threshold carrying capacities,” defined as "an environmental standard necessary to maintain a significant scenic, recreational, educational, scientific or natural value of the region or to maintain public health and safety within the region." These environmental threshold standards establish goals for environmental quality and express the shared aspiration for environmental restoration of the Tahoe Region. The standards shape the goals and policies of the Regional Plan and guide millions of dollars of public and private investment in the basin through the Environmental Improvement Program. The initial threshold standards set the course for the Region 40 years ago but were never intended to be immutable. The multi-disciplinary team that authored the 1981 threshold study report outlined specific triggers for standard review, and set the expectation that the standards would be reassessed at least every five years, and wrote: “environmental thresholds are not static standards that once in place remain forever” (TRPA 1982a).

Most of the current threshold standards were adopted in 1982 , and are based on science that is now over 40 years old. Numerous recommendations for modifying the system have been put forward, including over 90 recommendations in the 2011 Threshold Evaluation Report, and the standards have been repeatedly critiqued by partners, members of the threshold evaluation team, and external scientific peer reviewers. Prior attempts to review and revise the threshold standards, including the multi-year Pathway 2007 process, proposed but failed to eventuate significant revisions to the standards.

Following the 2015 Threshold Evaluation, the TRPA Governing Board identified the review and updating of the threshold standards and performance measures as a strategic initiative for the agency. TRPA is currently leading the process and incorporating new scientific information so that the standards that guide millions of dollars of public and private investment in the basin are representative, relevant, and scientifically rigorous. The goals of the initiative are:

- A representative, relevant, and scientifically rigorous set of threshold standards.
- An informative, cost-efficient, and feasible monitoring and evaluation framework to support adaptive management towards threshold standard attainment.
- A robust and repeatable process for review of threshold standards in the future.

BACKGROUND ON THE VMT THRESHOLD STANDARD FOR NITROGEN DEPOSITION

Nitrogen is a nutrient that promotes algal growth and is a pollutant of concern in the Lake Tahoe Basin (Lahontan & NDEP 2010a). In 1982, when the threshold standards were first adopted, a number of standards were adopted to address loading of algal nutrients to the lake. While the motivation for the standards was the clarity of the lake, some of the standards were adopted as air quality standards to reflect the pathway (the air) through which the nutrients reached the lake. Included in that set of standard were two standards adopted to reduce nitrate deposition onto the lake in 1982 (TRPA 1982a).

> (AQ13) Reduce the Transport of nitrates into the Basin and reduce oxides of nitrogen (NOx) produced in the Basin consistent with the water quality thresholds.
>
> (AQ14) Reduce vehicle miles of travel in the Basin by 10% of the 1981 base year values.

A third standard was adopted to that established the goal of stabilizing NOx emission in order as a regulate ozone concentrations.

(AQ4) Maintain Oxides of nitrogen (NOx) emissions at or below the 1981 level.

In 1982, the current VMT standard (AQ14) was also adopted as a part of sub-regional visibility standard (TRPA 1982b)[1].

The 10% reduction target from 1981 levels in AQ14 has its basis in the subregional visibility concerns, rather than in science that established a 10% reduction in emissions as target for lake clarity. Page 7-42 of the Threshold Study Report, includes a discussion of how a 10% reduction in VMT could help achieve a 30% reduction in atmospheric soil particles thought necessary to achieve the visibility standard (TRPA 1982a):

"The recommended [subregional visibility] standard is based primarily upon the ability to mitigate the sources of the problem [subregional haze]. To develop a recommended visual range for the subregional visibility threshold, reduction in 30 and 15 percent for soil particles in the atmosphere and wood smoke were used, respectively. To attain the 30 percent reduction in suspended soil, a 10 percent decrease in the number of vehicle miles of travel will most likely be required. However, it may be more effective to attain the recommended threshold by mitigating some of the other factors."

When discussing nitrate deposition, the Study Report provides background on the sources and deposition of nitrate and concludes as follows (at p. 7-44):

"Based on what is known about the atmospheric removal and chemical conversions involving nitric acid and particulate nitrate, it is not possible to develop an environmental threshold for these pollutants at this time. However, it is clear that the levels of oxides of nitrogen emissions in the Basin

[1] The VMT standard was removed as a measure of sub-regional visibility as part of the 2012 threshold updates which replaced it with four direct measures of Respirable and Fine Particulate Matter in the air, related to human health and regional visibility values (TRPA 2012a, 2012b).

should be reduced. As a result, a 10 percent reduction in the number of vehicle miles of travel from the 1981 base year level is recommended."

Thus, the current threshold standard for nitrogen deposition, that establishes a goal of 10 percent reduction in VMT from 1981 was based on calculations to achieve the subregional visibility standards and was thereafter repeated as a recommended policy statement that would also promote attainment of other goals. Where standards were focused on a management practice or policy direction (rather than a desired end state), the initial threshold study often included the recommended standard multiple times. For example, prior to the reorganization of there were three standards adopted to prevent degradation of stream environment zones, the management standard for inorganic nitrogen loading was repeated verbatim as both a pelagic and littoral standard. As part of the threshold update initiative, the Tahoe Science Advisory Council has recommended that this practice be discontinued to avoid confusion.

WHAT IS VMT?

Vehicle miles travelled (VMT) is a measure of the number of miles driven on roadways in a specified area and period of time. Estimates of VMT are generally approximations of actual vehicle miles traveled, based on estimates of trip distance and frequency (Salon et al. 2012). VMT could be precisely measured using car odometers, but rarely is because of the difficulty in obtaining the information (Salon et al. 2012) and the challenge of determining where the vehicle travel occurred. VMT is influenced by a complex set of interconnected factors and synergies between individual factors. For example, higher fuel prices reduce regional VMT, but the response at the household level is influenced by household location and income (Salon et al. 2012, 2013). Nationally, VMT has generally increased as the population has grown, the economy expanded, and car ownership has increased. The Federal Highway Administration (FHWA) forecasts suggest that nationwide VMT will continue to grow by 1.07% annually through 2035. The FHWA forecast is influenced by projections for population growth, economic growth, and disposable income, all of which are positively associated with VMT (FHWA 2017).

VMT is a function of the complex interplay of a variety of factors including: population (both inside and outside the region), gas prices, employment rates, local housing costs, demand for recreational opportunities in the region, access to alternative forms of transportation, and secondary home ownership. Increased congestion, work from home programs, employer carpool programs,

concentration of development in centers, presence of travel alternatives, higher unemployment, and higher fuel prices are all linked with reductions in VMT. Population growth, higher household income, higher employment rates, increased fuel economy and greater roadway capacity are all linked to increasing VMT. Increasing access to transit services, access to bicycle and pedestrian facilities, and the relative desirability of alternative modes of transportation in comparison to the use of the personal automobile may reduce VMT.

GOAL FOR THE NEW THRESHOLD STANDARD

The Bi-State Compact instructs TRPA to develop a transportation plan for the Region with two goals: first, to reduce dependency on the automobile, and second, to reduce air pollution from motor vehicles (Public Law 96-551, 96th Congress 1980). As a result of increasingly stringent federal and state tail pipe emissions standards, vehicles today are far cleaner than they were when the Bi-State Compact was amended nearly 40 years ago. Because of those improvements, air quality in Tahoe today is generally good, and nitrogen emissions today are well below the emissions reduction goal established in 1981.

Threshold standards establish the goals for environmental quality and express the shared aspirations for the Tahoe Partnership to work towards. Dating back to 2001, four consecutive threshold evaluation reports have recommended that the basis for the nitrogen based VMT threshold be reviewed (TRPA 2001, 2007, 2012a, 2016). Formal review of the current threshold standard process began nearly four years ago. In February of 2017, the Environmental Improvement Program (EIP) sub-committee of the Governing Board asked the Advisory Planning Commission to convene a Transportation Measures Working Group. Over eight months and six public meetings, the group surveyed the transportation measures landscape and produced a final report that identified and cataloged over 200 measures.

The report itself does not answer which measures best align with TRPA goals, it provides a resource from which to draw from. During the process of developing the report experts in the field provided their perspectives to the Working Group. When considering how to use the report to identify indicators appropriate for the Region's goals, Fehr & Peers Director of Evolving the Status Quo, Ron Milam, suggested considering three things, "What is it you are trying to create? What is it you are trying to protect? And, what is it you are trying to avoid?" Guided by those questions, Staff reviewed the

concerns expressed by stakeholders in association with VMT and identified areas where the goals of the partnership were not expressed by the existing threshold standards.

That process led to the identification of three core considerations to drive target setting. First, to support the attainment of the Greenhouse Gas (GHG) reduction goals of California and Nevada. Second, to increase mobility with a regional land use and transportation system comprised of alternative forms of transportation and a complementary development pattern. Third, to implement the Compact's direction to reduce dependence on the private automobile. RPIC formally endorsed updating the current nitrogen based VMT standard to one based on those three goals at its March 2020 meeting.

Two broad types of thresholds standards have been established. The first were standards established to protect existing resources from degradation. These were standards which were in attainment at the time of adoption, and for which the implementation mechanisms were designed to protect the resource from degradation. Examples include the standards for maintenance of the scenic viewsheds and the standard for the prevention of new aquatic invasive species from entering the lake. The second type of threshold standards sought to restore a resource that had been degraded or create something new entirely. Examples of the latter include the stream environment zone restoration standard and the pelagic lake clarity standard. The recommended standard is a standard of the latter type. It sets a goal for the region to work towards. However, it differs from past threshold standards of the type, in that it seeks to create something that never existed, rather than restore something which has been lost.

THRESHOLD STANDARD REVIEW

In addition to reviewing the content of the threshold standards, TRPA also committed to reviewing the structure implementing the standards. Following two years of work with the Tahoe Science Advisory Council, TRPA adopted a new adaptive management structure for managing information related to the threshold standards in April 2019. The adaptive management structure lays out a vision for organizing information to support evidence-based management in the Tahoe Region. The structure is designed to provide the data necessary to improve decision-making, promote accountability, and increase transparency at all levels. The structure also provides a framework to guide the review and updating of threshold standards and performance measures for the Environmental Improvement Program, Regional Plan, and Regional Transportation Plan.

The adaptive management system structure draws from best practice in the field of environmental management and integrates four elements: (1) conceptual models – that ground threshold standards in the scientific understanding of ecosystem function, (2) results chains – that link management actions to desired outcomes (threshold standards), (3) management actions – that are the implementation strategies and actions rooted in results chains, and (4) monitoring, evaluation, and learning – which provides the structure for incorporating new information into the design of policies, programs, and strategies to accelerate threshold attainment. The adopted structure provides specific criteria that new or revised TRPA thresholds standards must meet. The minimum criteria ensure that threshold standards will contain three qualities:

1) Specific - The standard establishes a specific numeric target, and benchmark/baseline values are documented where necessary.

2) Measurable – The standard has clearly defined indicator(s) that links to the standard, and there are practical ways to measure progress objectively and accurately towards attainment.

3) Outcome-based – Standards focus on a desired condition for an environmental end state, not a means to achieve the desired outcome, or an intermediate product.

INDICATOR SELECTION

To identify a new indicator and target, the staff reviewed the appropriateness of indicators for effectively measuring progress of the three policy goals of the standard: support the attainment of the Greenhouse Gas (GHG) reduction goals of California and Nevada, increase mobility, and reduce reliance on the automobile.

VMT can be expressed in absolute terms (total miles traveled) or as a function of another factor (e.g. per worker, or per residents). The latter are collectively referred to as efficiency-based measures. Efficiency based measures express the amount of VMT in a region as a function of a factor thought to be related to that VMT. One of the most common efficiency-based measures is expressing VMT in a region as a function of the region's population. Analyzing VMT as a function of the population (VMT per capita) allows for comparison of trends through time (Circella et al. 2016) or between regions (Clark & Cushing 2004; McMullen & Eckstein 2013) while controlling for differences in population size.

While absolute VMT has historically been of interest because of the relationship between VMT and total vehicle emissions, VMT per capita is a measure of efficiency of a transportation system in moving individuals between the places they need to be. Higher VMT per capita regions are those where individuals are traveling farther distances to get between home, work, shopping, etc. and are generally reliant on the automobile to move between their destinations. Lower VMT per capita regions are those that are characterized by individuals travelling shorter distances between their desired destinations, and where there are options other than the car (e.g. bike paths, transit systems) that are chosen more frequently as a means of taking those trips.

When applied in practice, absolute VMT and per capita VMT provide different information about a Region or regions being compared. For example, the New York metro area has the second highest absolute VMT of the 100 largest metro areas in the United States, but the lowest VMT per capita (Robert Puentes & Adie Tomer 2008). This means that New York is responsible for more transportation-based emissions than all but one other metro area in the country, but also that if all residents lived in metro areas like New York, nationwide emissions would be far lower. Jackson, Mississippi and Rochester, New York have about the same total VMT, but in Jackson the average resident drives more than twice as much as a resident of Rochester (Robert Puentes & Adie Tomer 2008). As illustrated by the examples above, per capita VMT is more reflective of auto dependence than absolute VMT, because of the confounding influence of factors like population.

The combination of the development footprint, the transportation infrastructure, and choices made by travelers in the region influence the VMT per traveler. The total amount of VMT is a function of the three factors listed above, and the choices of individuals that influence the total number of travelers in the region. Total number of travelers (i.e., the service population) in the region is influenced by the number of people that chose to live, work, or visit Tahoe. These decisions are largely independent of local policy setting but exert significant influence over the total VMT in the region.

The current threshold standard establishes a target for the total amount of VMT in the region. As a result, the attainment status of the threshold standard has varied in response to factors that do not meaningfully reflect the changes in regional land-use or transportation system from realization of the Regional Plan and Regional Transportation Plan.

To protect and preserve the national treasure that is Lake Tahoe for future generations, the Regional Plan places strict controls on the pace of and total amount of development allowed in the region (TRPA 2012b). Despite these strict controls on regional development, the attainment status of the VMT threshold standard has fluctuated over the years. Twenty years ago, the current VMT standard was assessed as out of attainment, while in the 2011 and 2015 threshold evaluations it was found to be in attainment (TRPA 2012a, 2016). The California Department of Transportation (CalTrans) estimates for VMT on the California side of the region during this same time period showed the same general pattern, but with even greater fluctuation than estimated in Tahoe[2]. In 2001, estimated daily VMT on the California side of the Region was 1,073,000 (CalTrans 2018a). In 2014, California side VMT was estimated to have dropped to just over half the volume in 2001, at 560,840 daily (CalTrans 2018b). These changes are likely attributable to macro scale factors, including the loss of resident population, decline in gaming visitation, and the great recession.

Macro scale factors, like choice of residency exert significant influence on absolute VMT. If more people choose to live in the Region, total VMT in the Region will likely increase as VMT generally increases as population increases (FHWA 2010, 2017). If people choose to live elsewhere, in-Region VMT will likely decrease. There are currently 47,655 residential units in the Tahoe Region. Occupancy rates published by the U.S. Census Bureau 2018 American Community Survey (ACS), estimate that 45% of residential units are occupied by full-time residents and 55% are not occupied by full-time residents (US Census Bureau 2019). Housing units not occupied by full time residents may be second homes, time-shares, seasonal rentals, or short-term rentals. Population in the region can and does fluctuate for reasons unrelated to the number of residential units in the region. Expanding the geographic range considered, the dynamics of VMT can also change. If current residents of the region are priced out of the market or chose to move outside the region, but continue to work in the region, the longer commute trips can increase total VMT (inside and outside the region) even if there is a reduction in the VMT within the region.

Similar dynamics exist with visitation and visitor generated VMT. While the total number of rooms available to visitors to the region is limited by the Regional Plan, VMT varies considerably in response to

[2] Nevada Department of Transportation did not estimate VMT in Nevada portion of the Region until 2016.

the occupancy rate of the hotels, motels, resorts, and casinos in the region. In the "shoulder" season, when fewer visitors choose Tahoe as a destination, both occupancy rates and VMT decline. The same pattern can be seen in response to macro-economic conditions. During the great recession, there was a considerable decline in the number of overnight visitors in the Region (see figure 1). It wasn't until about 2017 that the number of rooms rented in the region returned to pre-recession levels. The economic recovery is also evident in CalTrans VMT estimates. CalTrans estimates suggest that after declining during the recession, daily VMT in 2018 was 1,032,960, just shy of the 2001 level (CalTrans 2018c). The decline in gaming visitation is well documented, with estimates suggesting that between 1990-2010, the industry declined by two-thirds (Eadington 2011). That the attainment status of an absolute VMT could fluctuate in response to macroeconomic conditions rather than regional programs and policies, is a core area of concern for indicator selection for the updated threshold standard.

Indicator selection considered responsiveness to the plans, as well as how the indicator would likely respond to specific projects or region changes. Looking at the historic record of VMT in the region, the response of absolute VMT to the great recession raised concerns about absolute VMT as metric. The potential response of the metric to Regional Plan priorities like affordable housing also raised concerns. Throughout the threshold update process, stakeholders have commented on the need to build more workforce and affordable housing units in Tahoe. Affordable and workforce housing would likely increase the resident population of the Region, which in turn would likely increase the in Region VMT.

TRPA's unique planning authority allows it to closely coordinate land use (Regional Plan) and transportation (Regional Transportation Plan) planning. The two plans work together to provide visitors and residents with alternatives to personal automobile travel and reduce VMT. For more than twenty years the focus of both has been supporting compact, mixed-use development, and walkable, bikeable, transit-friendly communities. An efficiency based VMT standard better aligns with the identified polices goals. It also affords consistency with California and Nevada state policies with respect to GHG reduction and aligns with and is responsive to meaningful change in the regional land use and the transportation system. At its July 2020 meeting RPIC directed staff to develop an efficiency-based metric for establishment of the VMT threshold standard.

TARGET ESTABLISHMENT

There is no absolute value for per capita VMT that distinguishes efficient from inefficient or a well-designed community from a poorly designed one. Unlike many threshold standards which owe their target to a historic period where conditions were better, there is also no historic precedent that stakeholders' reference as an era when the Region's transportation and land use system worked together to efficiently move people around the Region without relying on the private automobile.

The desire to reimagine Tahoe's transportation system dates back at least to the Bi-State Compact, which established TRPA and directed it to "reduce dependency on the automobile by making more effective use of existing transportation modes and of public transit to move people and goods within the region." To achieve that goal the Regional Plan emphasizes mixed-use and compact development /redevelopment, and the Region's Regional Transportation Plans have prioritized investments in non-auto modes and have not proposed any major expansions of the Region's automobile infrastructure.

Target setting for the standard was divided into three steps; 1) Establish the baseline level of VMT, 2) Establish the baseline population, and 3) Set the target and design the implementation framework. The first two steps establish the amount of per capita VMT of today (or baseline), and the third step sets the vision for reducing per capita VMT in the future. To solicit feedback on each step of the target setting process, staff brought draft proposals to a Transportation Technical Advisory Committee (TTAC). Between August and December of 2020, the TTAC convened three times, once for each of the three steps of the target setting process. The recommended target incorporates much of the feedback received during those sessions. A diverse array of stakeholders provided feedback through the TTAC meetings and subsequent meetings. The guidance and direction received was often conflicting, and the recommended target and implementation framework reflect a compromise. No single stakeholder is likely to see all that they want in the package.

VMT BASELINE

Identifying the baseline amount of VMT for standard establishment required answering three questions identified below. Feedback on each was solicited at the August 2020 meeting of the Transportation Technical Advisory Committee.

WHAT VMT SHOULD BE INCLUDED?

Standard establishment requires clear articulation of which VMT should be included in the standard. Options considered included, limiting VMT by geography, to either only VMT that occurs inside the region, or consideration of the full trip length of any trip that passes through the region. Other alternatives considered included limited VMT consider to specific trip purposes (e.g., recreation, work), or specific traveler types (e.g. day visitors, commuters). Staff recommends that all VMT inside the region by any traveler or for any trip purpose be included the VMT for threshold standard establishment. The inclusion of all VMT in the threshold standard, places emphasis or reducing VMT from any source. The inclusion of all VMT for standard establishment purposes does not preclude more detailed analysis of travel patterns and VMT generation (e.g. identification of commute or resident recreation VMT). Staff further recommends investment in refining methods to estimate trip length outside the region and continued programmatic emphasis to reduce external VMT.

WHICH TRAVELERS SHOULD BE INCLUDED?

Establishment of an efficiency-based threshold standard also requires defining the unit (population) over which that efficiency will be measured. Populations considered for establishment of the threshold standard could include, residents, seasonal residents, workers, all travelers, or any subset or combination of the travelling population. Staff recommends that the standard seek to accurately reflect the overall efficacy and efficiency of the transportation and land use system. To do so, all travelers must be accounted for in the efficiency metric. Accounting for all travelers means the inclusion of visitors, residents, commuters, and anyone else traveling in the Region. Accounting for only a subset of those travelers would provide only a partial picture of the source of VMT and be inconsistent with the recommendation to consider all VMT.

WHAT TIME PERIOD SHOULD BE CONSIDERED?

VMT and the total number of travelers contributing to it can be measured at any time scale for which data is available. This includes on a multi-year, annual, seasonal, monthly, or even daily basis. Smaller time periods of evaluation will likely result in more bias in estimating both VMT and population as a result of uncertainty inherent of estimates of both. Staff recommends standard establishment using annual average VMT. The use of annual average VMT emphasizes the importance of and accounts for

the contributions of projects and programs that reduce per capita VMT at any time of year. Staff recommends that 2020 VMT estimates not be considered in the establishment of a VMT baseline because of the impact of Covid-19 and the fact that data for all of 2020 are not available. Use of multiple years and longer time periods as the basis for standard setting and evaluation generally reduces that uncertainty.

VMT DATA SOURCE: HIGHWAY PERFORMANCE MONITORING SYSTEM (HPMS)

The Highway Performance Monitoring System (HPMS) is a U.S. Department of Transportation, Federal Highway Administration (FHWA) national reporting program that provides information on all travel on public roads in the United States. States use standardized reporting and monitoring procedures to produce and submit a suite of travel related data to FHWA each year (FHWA 2016). CalTrans and NDOT both publish VMT estimates for their respective portions of the Tahoe Region as part of their HPMS reporting requirements.

Links to the annual reports for each state are provided below:

- Caltrans: https://dot.ca.gov/programs/research-innovation-system-information/highway-performance-monitoring-system
- NDOT: https://www.nevadadot.com/doing-business/about-ndot/ndot-divisions/planning/roadway-systems/annual-vehicle-miles-of-travel

Caltrans has published estimates of VMT on the California side of the Tahoe Region for each year since 2001. NDOT has published VMT estimates for the Nevada side of the Tahoe Region since 2016. Table 1 summarizes the CalTrans and NDOT estimates for annual average daily VMT for the region. CalTrans HPMS data is still preliminary for 2019.

Table 1: HPMS VMT Estimates for the Tahoe Region (2016-2019)

Year	CA	NV	Total
2016	1,016,891	435,213	1,452,104

2017	1,026,876	525,728	1,552,604
2018	1,032,957	437,612	1,470,569
2019	937,268	488,709	1,425,977

Staff recommends HPMS reporting be the primary source of VMT data for threshold standard establishment and assessment. Staff further recommend that the three-year annual average of HPMS VMT be used as the baseline for establishment of the VMT threshold standard (Table 2). The use of multiple years of data will help reduce the influence of interannual variability (e.g. as a result of weather) in single strange that is not reflective of meaningful change in the land use or transportation systems.

Table 2: Three-year annual average daily VMT (2016-2019)

Period	3-year HPMS average
2016-2018	1,491,759
2017-2019	1,483,050

Staff had initially recommended the use of VMT data from StreetLight Data Inc. (StreetLight) for standard establishment. Numerous stakeholders raised concerns about reliance on a novel VMT estimation technique, and the possibility that the attainment status of the standard could change solely for methodological reasons. In response to those concerns, staff is proposing to use the more mature and established government sources of VMT data for establishing the standard. HPMS reported VMT for the region is more likely to provide a robust and stable estimate at the regional scale. Staff will continue to explore the use of StreetLight and other big data sources, to better understand travel patterns and inform management actions to accelerate threshold attainment.

POPULATION DATA SOURCE: TAHOE EFFECTIVE POPULATION MODEL

Tahoe is a tourist destination. Like other tourist destinations, the number of people moving around the Region on any given day far exceeds the number of full-time residents. The full-time residential population of the Region was most recently estimated at just over 50,000 by the US Census American Community Survey (US Census Bureau 2019). The full-time resident population as estimated by the US Census American Community Survey has been relatively stable for the last decade (US Census Bureau 2019).

The total number of people moving around the region, is referred to as the effective, traveling, or service population. Effective population can include residents, visitors, workers, students, and anyone else traveling in the region. Because both Regional Plan and Regional Transportation Plan seek to provide a more efficient travel experience for all travelers within the Region, staff recommends that the service or total traveling population be used for the establishment of the threshold standard. While estimations of Resident population are more readily available than estimates of the effective population, they provide a more limited and potentially biased perspective on the overall travel experience within the Region.

Staff engaged the Tahoe Science Advisory Council to help estimate the total number of travelers or the effective population of the region. The effective population refers to the number of individuals in an area at a specific time (Campanelli et al. 2017; Morrison et al. 2020). While regional and infrastructure planning often relies on the estimates of the resident population of a region, in regions with large variations in seasonal population, the residential population estimates provide only a partial picture of the actual number people that are in or traveling around the region.

Tahoe's regional resident population has never exceeded 65,000 people, according to the U.S. Census, but the number of people in the Tahoe Region on peak days has been estimated to exceed 200,000. Estimating visitation to the Region has always been a challenge. Early estimates suggested that 15 million people visited annually (TRPA 1978). More recent estimates have varied widely, suggesting between 13 and 24 million visitors annually (Svensson 2017; TTD 2017).

The Tahoe Effective Population Model (TEPM) is an approach developed with the Tahoe Science Advisory Council to estimating the annual average daily effective population of the Tahoe Region using

Total Effective Population of the Tahoe Region:

(1) Effective Population = Residents + Overnight Visitors + Day Visitors + Commuters

a variety of available datasets, in conjunction with information about travel and visitation behavior of residents and visitors derived from surveys and studies. The effective population defined here includes residents, visitors (including day, overnight, second homeowners and their guests), and commuting workers. Formal estimates are available for some of these populations, while others, such as the number of day visitors are more challenging to develop. The approach is implemented in two primary steps, first estimation of the overnight population of the region, and second estimation of the population entering the region during the day.

The TEPM takes an additive approach to estimating the total effective population by first estimating the size of contributing sub-populations. The sub-populations considered include, residents, visitors, and commuters. The size of individual sub-populations is then summed to arrive at the effective population. The TEPM's approach to sub-population estimation is rooted in the conceptual framework of the Tahoe Travel Demand Model. The overnight population is estimated using data on the number of residents of the region, and information on the number of visitors at overnight accommodations in the region (including hotels/motels, campgrounds, and short-term rentals). The population entering the region is estimating by balancing the total entry traffic volumes in the region with the known populations and travel behaviors of the sub-populations.

The conceptual approach can be applied at a variety of time scales ranging from a single day to an annual estimates. Application of the approach should acknowledge the uncertainty in the estimate of the individual parameters of the model increases with narrowing of the time period over which the estimate is produced. That is, annual average estimates are likely to be more accurate than estimates for an individual day.

Staff discussed the possibility of direct estimation of the Region's population based on big-data sources to the TTAC in September 2020. The overwhelming feedback received at the meeting, and in subsequent

discussions with stakeholders was that the estimation method should be rooted in data that could be more readily quantified and reviewed by stakeholders, such as traffic counts and hotel occupancy rates. This direction guided Staff's continued investment in TEPM approach to population estimation.

TARGET SETTING

VMT per capita is a function of the interaction between the existing and future land use and transportation systems. The Regional Plan establishes the vision for the future land uses and development pattern of the Region. The Regional Transportation Plan (RTP) establishes the vision for the robust multi-modal transportation system that enables people to navigate the current and future landscape. Numeric target setting was grounded in Regions' shared vision for its future.

To establish a numeric target for per capita VMT threshold standard, Staff considered full implementation of the Regional Transportation Plan and effectiveness of Regional Plan incentives to promote multifamily development and concentrate development in town centers. The forecasts were used to develop the recommended target for the threshold standard and the associated implementation milestones.

At a high level the target reflects the impact of continued investment in the RTP core areas of transit, trails, and technology to improve the traveling experience in the Region. This includes providing 15-minute transit service between town centers and recreation destinations and the region, and 30-to 60-minute transit service between neighborhoods and town centers, and inter-regional service for commuters and visitors from neighboring regions. Waterborne transit connecting the north and south shores and connecting residents and visitors to key destinations around the lake. As result, ridership will increase over fivefold. The plan includes completion the multi-use Tahoe Trail around the lake and improving connectivity within and between communities. It includes closing gaps in the sidewalk and trail system that will increase safety, enhance accessibility for people with a disability, and provide critical community, work, and recreation connections from the neighborhoods. In total this includes construction of an additional 110 miles of bicycle and pedestrian trails. Seventeen mobility hubs and transit centers will provide enhanced access to the augmented network of transit and trails and support parking once within the Region and using alternative modes to travel within the region once here. Technologic advances and investments will provide real-time information to travelers through online interactive maps and will promote informed travel choices. These investments will build awareness and

promote utilization of app-based transportation services, such as on-demand microtransit and bike and scooter sharing. Trip planning tools and informational kiosks will also help manage parking at heavily visited recreation sites, relieving congestion at pinch points. The plan will also continue to accelerate the shift to zero emission vehicles, by promoting installation of electric vehicle charging stations around the lake. In short, the vision would completely alter the travel experience in Tahoe. Additional details on the projects included in the forecast can be found the 2020 RTP.

The projects mentioned above and forecasts for future demographics and land use were simulated in the Tahoe activity based travel demand model and associated analysis framework to estimate VMT in 2045. Those forecasts suggest that implementation of the 2020 RTP would result in a 6.8% reduction in per capita VMT by 2045. Staff recommends this as the threshold standard goal for per capita VMT. The goal is both ambitious and achievable goal for Region. Achieving the goal would significantly advance the three goals for the standards; reduce reliance on the automobile, reduce per capita GHG emissions, and increase mobility.

TABLE 3: TAHOE REGION EFFECTIVE POPULATION AND VMT ESTIMATE AND TARGETS (2018-2045)[3]

	2018	2035	2045
Effective Population (EP)	136,962	144,314	148,654
Total Daily VMT	1,393,994	1,388,320	1,410,202
Annual Average Daily VMT per Capita	10.18	9.62	9.49
Percent Reduction from 2018 VMT per Capita		5.5%	6.8%

The 2018 baseline used here reflects the base year for the Tahoe travel demand model used to forecast VMT in the Region for the 2020 RTP. The recommended target is currently formulated as a percent

[3] The estimates for the effective population, total daily VMT, and annual average daily VMT, are based on Tahoe AB model values for the modeled day. The final values for the threshold standard will be annual average values source from Streetlight and the Highway Performance Management System for VMT and the Tahoe Effective Population Model for effective population.

reduction from the baseline VMT and Population for 2020. Prior to adoption, the absolute value of the recommended threshold standard (i.e., 9.49 VMT/capita), will be recalculated using the final VMT from the recommended base years and the final effective population estimate. The Tahoe Effective Population Model is currently being refined with the support of the Tahoe Science Advisory Council.

Target setting with a recognition of what is attainable or achievable is also consistent with prior discussions with, and direction from, the Tahoe Science Advisory Council on the updating of the Threshold Standards. The Council has repeatedly emphasized the importance of articulating SMART (Specific, Measurable, Attainable, Relevant, and Timebound) threshold standards. The proposed threshold standard target is consistent with that guidance. Ambitious, but reasonably attainable.

TARGET CONFORMANCE ANALYSIS

The overlapping federal, state, and Bi-state Compact transportation planning authorities that apply to the Tahoe Region form the foundation upon which TRPA prepares transportation plans and performance measures. The Bi-State Compact requires TRPA to prepare a transportation plan as part of the Regional Plan. Federal legislation requires governors to designate metropolitan planning organizations (MPOs) responsible for regional transportation planning and project funding. The TRPA Governing Board, with the addition of a federal government representative, is the designated Tahoe MPO by both the California and Nevada governors.

California's SB375 seeks to reduce GHG emissions from the transportation sector. SB 375 applies to the Tahoe MPO, requires the transportation plan to include a Sustainable Communities Strategy (SCS) to achieve per capita GHG reduction goals for the transportation sector as set by the California Air Resources Board. The SB 375 per capita GHG reduction goal for the Tahoe MPO is a 5% per capita reduction over the 2005 level by 2035. Although the GHG reduction requirements of the RTP/SCS apply only to the California side of the Region, as a practical matter the Tahoe Region is a single airshed. The state of Nevada is now in the process of adopting the California vehicle emission standards and preparing a state climate plan that also includes GHG reduction in the Tahoe Basin. Hence, GHG per capita reduction targets are included as a key component of the new VMT per capita threshold standard.

GHG emissions from the transportation sector is a function of VMT and the engine type and operation of the vehicles that travel those miles. Per capita mobile source GHG and per capita VMT are positively correlated, but the relationship is not exactly one to one. Engine size and the type of vehicles in the fleet (e.g. diesel, hybrid) and driving conditions (e.g. presence of traffic) also influence total emissions per mile traveled. Under SB375, the majority of the per capita reduction in GHG is expected to come from lower per capita VMT, not lower emissions per vehicle. Regions are prevented from taking credit for GHG reduction from state or national programs that require low and zero emissions vehicles.

The recommended threshold standard establishes a goal for per capita VMT reduction through 2045. To assess the relationship with the regioin's SB375 GHG reduction 2035 goal, the expected performance of the per capita VMT reduction goal through first 15 years of program is compared with the 2035 target for SB375. The analysis below differs from the threshold standard analysis above in that only the resident population for the Region is considered in the denominator, and the baseline for the assessment is 2005, not 2018. Thus, even though the "per Resident" figures in Table 2 are higher than the "per Capita" figures in Table 1, the percentage reduction is what is relevant for the comparison.

TABLE 4: TAHOE REGION PER CAPITA VMT - RESIDENT ONLY (2005-2045)

	2005	2018	2035	2045
Residents	54,473	51,624	55,776	58,040
Total Daily VMT	1,506,665	1,393,994	1,388,320	1,410,202
Annual Average Daily Total VMT per	27.66	27.00	24.89	24.30
Percent reduction from 2005 VMT per Resident		2.4%	10.0%	12.2%
Percent reduction from 2018 VMT per Resident			7.8%	10.0%

The above analysis indicates that the proposed target for the threshold standard would achieve the per capita GHG reduction goal for the Region and is in conformance with the adopted goal under SB 375 (i.e., Table 4 shows the reduction is projected to be 10.0% when compared to 2005, well over the 5%

target). The proposed 6.8% VMT per capita reduction threshold standard would provide GHG reduction benefits above and beyond both the reductions from state and national emissions reductions. The proposed threshold standard is also more ambitious than the 5% per capita GHG reduction target under SB375. The recommended standard establishes a longer planning horizon, and does not include contributions from other regional programs that reduce mobile source GHG.

IMPLEMENTATION

The Regional Plan and the Regional Transportation Plan are designed to achieve threshold standards. TRPA, together with implementing partners, adaptively manage the region so that all threshold standards are achieved and maintained. The agency reviews and updates the goals for the Region (threshold standards). It also reviews and updates the relevant implementation mechanisms (i.e., policies, plans, regulations, and programs) so that in their entirety the new threshold standards will be attained and maintained. The adaptive management approach is a key component of the new generation of threshold standards being created. TRPA is proposing to replace the current VMT standard, designed to reduce nitrogen emissions to improve air and water quality, with a new VMT threshold standard that measures the efficiency of the Region's transportation system operation. As part of the update, TRPA is reviewing the Regional Plan, Regional Transportation Plan, Code of Ordinances, and other implementing programs like the Environmental Improvement Program to determine where these plans and programs can support implementation of an updated VMT efficiency standard.

To reduce reliance on the automobile, promote mobility, and support the GHG initiatives of the two states, RPIC directed staff to establish a target for reducing per capita VMT in the Tahoe region. Based on that direction, Staff develop the recommended target presented above. The per capita VMT standard establishes a goal for the Region to work towards and it will be several decades before the standard is likely to be attained. This also means that like the lake clarity standard, the per capita VMT standard will be out of attainment as soon as it is adopted.

To monitor progress towards standard attainment, two types of interim milestones are recommended. The first are milestones at which progress is evaluated, and where appropriate, modifications to implementation mechanisms (policies, plans, programs, etc.) are recommended to the decision bodies. The second are milestones at which progress is evaluated, and if it is found not to be in line with

expectations, a specific, predefined action is taken. Staff recommends that an advisory group be tasked with reviewing progress, developing recommendations for program modification to accelerate attainment, and determining status relative to the established milestones.

The recommended milestones reflect reasonable expectations for progress towards attainment based on the forecasts. Progress towards the standard will be driven by implementation of the 2020 RTP and regional land use change. Both regional land use and transportation infrastructure are expected to change slowly over time. Funding and project delivery take time in both the transportation and land use sectors. Detecting response in per capita VMT as a result of those changes lags further because it requires at least a calendar year of data collection post the start of occupancy/operation for development/redevelopment projects and changes in transportation infrastructure or operation (e.g. transit operation or new bicycle or pedestrian infrastructure).

The VMT per capita milestones were established using the forecasted reductions in per capita VMT. The milestone schedule uses a linear decline in annual per capita VMT between the base year and the target attainment date (Table 3). The schedule utilizes the recommended three-year annual average to assess progress. Because a three-year annual average is used, the assessed per capita VMT in the evaluation year will be slightly higher that the observed per capita VMT in that year. For example, the annual VMT per capita is expected to achieve the target in 2045, but the three-year annual average is not expected to achieve the target until 2047.

Table 3: Expected VMT Per Capita Reduction Schedule[4]

Year	VMT/Per Capita	Annual Reduction	Cumulative Reduction	3-year Average	3-year Average Reduction	3-year Average % to Target
2018	10.18	0.03				
2019	10.15	0.03	0.03			
2020	10.13	0.03	0.05	10.15	0.25%	3.70%
2021	10.10	0.03	0.08	10.13	0.50%	7.41%
2022	10.08	0.03	0.10	10.10	0.75%	11.11%
2023	10.05	0.03	0.13	10.08	1.00%	14.81%
2024	10.03	0.03	0.15	10.05	1.26%	18.52%
2025	10.00	0.03	0.18	10.03	1.51%	22.22%
2026	9.98	0.03	0.20	10.00	1.76%	25.93%
2027	9.95	0.03	0.23	9.98	2.01%	29.63%
2028	9.92	0.03	0.26	9.95	2.26%	33.33%
2029	9.90	0.03	0.28	9.92	2.51%	37.04%
2030	9.87	0.03	0.31	9.90	2.76%	40.74%
2031	9.85	0.03	0.33	9.87	3.01%	44.44%
2032	9.82	0.03	0.36	9.85	3.26%	48.15%
2033	9.80	0.03	0.38	9.82	3.51%	51.85%
2034	9.77	0.03	0.41	9.80	3.77%	55.56%
2035	9.75	0.03	0.43	9.77	4.02%	59.26%
2036	9.72	0.03	0.46	9.75	4.27%	62.96%
2037	9.69	0.03	0.49	9.72	4.52%	66.67%
2038	9.67	0.03	0.51	9.69	4.77%	70.37%
2039	9.64	0.03	0.54	9.67	5.02%	74.07%
2040	9.62	0.03	0.56	9.64	5.27%	77.78%
2041	9.59	0.03	0.59	9.62	5.52%	81.48%
2042	9.57	0.03	0.61	9.59	5.77%	85.19%
2043	9.54	0.03	0.64	9.57	6.02%	88.89%
2044	9.52	0.03	0.66	9.54	6.28%	92.59%
2045	9.49	0.00	0.69	9.52	6.53%	96.30%
2046	9.49	0.00	0.69	9.50	6.69%	98.77%
2047	9.49	0.00	0.69	9.49	6.78%	100.00%

PROPOSED REGIONAL PLAN AMENDMENT

To implement and facilitate management towards attaining and maintaining the per capita VMT threshold standard, an amendment to the Regional Plan Goals and Polices is proposed. The proposed amendment adds a new goal in the Development and Implementation Priorities sub-element and six associated policies.

GOAL DP-5 TRPA SHALL USE A SERIES OF MILESTONES TO ADAPTIVELY MANAGE REGIONAL LAND USE AND THE TRANSPORTATION SYSTEM TO ACHIEVE AND MAINTAIN THE PER CAPITA VMT THRESHOLD STANDARD.

POLICIES:

DP-5.1 A TECHNICAL ADVISORY BODY (OR BODIES) WITH EXPERTISE IN TRANSPORTATION AND LAND USE PLANNING SHALL PROVIDE GUIDANCE ON PROGRAM MODIFICATIONS NECESSARY TO ATTAIN AND MAINTAIN THE VMT PER CAPITA THRESHOLD STANDARD.

The advisory body will provide recommendations to the Governing Boards of the Tahoe Regional Planning Agency and the Tahoe Metropolitan Planning Organization on policy, issues, and projects related to regional transportation, including but not limited to the development and implementation of the Regional Transportation Plan, Sustainable Community Strategy, regional street and highway system, pedestrian and bicycle facilities, and multimodal transportation planning within the Tahoe Region. The advisory body will hold regularly scheduled public meetings to review programs, policies, and progress towards attainment of the threshold standard. The advisory body will recommend program modifications, as necessary. The TRPA Transportation Planning Manager and/or his or her designee shall attend all advisory committee meetings. TRPA shall provide staff support as necessary to the advisory committee.

[4] Per the footnote above the percent reductions will be carried forward to establish the value for the threshold standard. The Per Capita VMT estimate will be refined prior to threshold adoption as base year estimates for VMT and effective population are refined.

DP-5.2 THE TECHNICAL ADVISORY BODY (OR BODIES) WILL PREPARE AND TRANSMIT A REGULAR REPORT TO THE GOVERNING BOARDS OF THE TRPA AND TMPO THAT SUMMARIZES PAST PERFORMANCE, FINDINGS, AND RECOMMENDATIONS.

Starting in 2022 and every two years thereafter, the technical advisory body shall review and summarize performance related to milestones for implementation of the Regional Plan and Regional Transportation Plan as described in Policy DP-5.4 and performance related to milestones for progress towards attainment of the VMT Per Capita threshold standard as described in Policy DP-5.5. When the review of performance indicates the milestones are not being met, the report must include recommendations that specifically target reducing VMT Per Capita by category. The recommendations shall address the adaptive management responses in Policy DP-5.6.

DP-5.3 – SCHEDULE OF MILESTONES TO OBTAIN A REGIONAL FUNDING SOURCE FOR TRANSPORTATION PROJECTS AND PROGRAMS

A. 2022 Regional Revenue Milestone - New sources of dedicated transportation funding for Tahoe are needed to make progress toward attainment of the VMT per capita threshold standard. By December 31, 2021, a proposal for dedicated sources of transportation revenue for Tahoe, endorsed and supported by the Bi-State Transportation Consultation, shall be submitted to the Nevada and California legislatures.
B. 2024 Regional Revenue Milestone - A regional revenue for dedicated transportation funding for Tahoe shall commence implementation no later than December 31, 2023.

DP-5.4 – SCHEDULE OF MILESTONES FOR IMPLEMENTATION OF REGIONAL PLAN AND REGIONAL TRANSPORTATION PLAN PROJECTS AND PROGRAMS

Starting in 2022 and every two years thereafter, the advisory body will review progress and recommend program modifications if necessary. The advisory body shall review the programs and policies of the Regional Plan that promote attaining and maintaining the VMT per capita threshold standard and assess progress on the implementation of programs and projects of the Regional Transportation Plan. Based on its review of the implementation and effectiveness of the Regional Transportation Plan and Regional Plan, the advisory body may recommend changes to the Regional Plan and Regional Transportation Plan including but not limited to:

A. Modifications to the FTIP/STIP project selection process
B. Modifications to the regional grant program funding formula
C. Modifications to the Regional Transportation Plan project selection process
D. Modifications to zoning or project permitting process
E. Modifications to fee structures or transfer incentives

DP-5.5 – SCHEDULE OF MILESTONES FOR ASSESSMENT OF PROGRESS TOWARDS ATTAINMENT OF THE THRESHOLD STANDARD

Starting in 2029, and every 8 years thereafter, an assessment will be made of the progress in attaining VMT Per Capita threshold against the following milestones.

A. 2029 Results Milestone – The advisory body will review progress towards standard attainment. Per Capita VMT between 2026-2028 shall be equal to or below 9.95, a 2.26% reduction from the 2018 baseline, and a third of the way to the 2045 threshold standard goal.

B. 2037 Results Milestone – The advisory body will review progress towards standard attainment. Per Capita VMT between 2034-2036 shall be equal to or below 9.75, a 4.27% reduction from the 2018 baseline and 63% of the way to the 2045 threshold standard goal.

C. 2045 Results Milestone – The advisory body will review progress towards standard attainment. Per Capita VMT between 2042-2044 shall be equal to or below 9.50, a 6.69% reduction from the 2018 baseline and 96.3% of the threshold standard goal.

D. 2048 Results Milestone – The advisory body will review progress towards standard attainment. Per Capita VMT between 2045-2047 shall be equal to or below 9.49, a 6.78% reduction from the 2018 baseline and in full attainment of the threshold standard goal.

D. 2056 Results Milestone – The advisory body will review progress towards standard attainment. Per Capita VMT between 2053-2055 shall be equal to or below 9.49, a 6.78% reduction from the 2018 baseline and in full attainment of the threshold standard goal.

DP-5.6 – ADAPTIVE MANAGEMENT RESPONSES TO BE IMPLEMENTED AFTER A RESULTS ASSESSMENT

The following regional management responses shall automatically go into effect if the milestones in DP-5.3 – DP-5.5 are found not to have been attained based on the recommendation of the advisory body:

A. 2024 Regional Revenue Milestone - If a regional revenue collection has not commenced by December 31, 2023:
    1. The standard of significance for project review for all projects shall be no net unmitigated VMT, except for deed restricted affordable and/or workforce housing. This measure will remain in effect until such revenue collection has commenced.
B. 2029 and subsequent VMT Per Capita Results Milestones – If Regional VMT Per Capita is not at or below the level identified in DP-5.5.A-C:

The per unit rate of the mobility mitigation fee will increase by 10% over the previous rate on January 1st of the following year. Deed restricted affordable and/or workforce housing shall be exempt from fee rate increase. The fee rate modification shall automatically go into effect and remain in effect until such time the advisory body finds that VMT per capita is on schedule with the next results milestone.

WATER QUALITY AND LAKE CLARITY

Lake Tahoe‘s famed clarity has declined significantly since UC-Davis began regular monitoring in the 1960s (TERC 2020). The declines prompted the concerns of managers and stakeholders alike and led the implementation of numerous development controls and restoration projects designed to restore the lake’s famed clarity. Declining lake clarity was also the primary motivation for the adoption of the current nitrogen deposition VMT threshold standard. The threshold update process reviewed the current knowledge of the relationship between VMT and lake clarity to assess the potential for a VMT based water quality standard. That review concluded that a VMT based standard would not meaningfully contribute to attainment of the TMDL identified load reduction targets, but that a VMT based standard would contribute to the goals outlined above.

LAKE TAHOE TMDL

Building upon earlier work to restore lake clarity, the Lake Tahoe Total Maximum Daily Load (TMDL) is a science-based strategy to restore the historic clarity of Lake Tahoe over 65 years (Lahontan & NDEP 2010a). TMDL development began nearly ten years earlier after Lake Tahoe was listed by the U.S. Environmental Protection Agency as a Section 303(d) impaired waterbody in 2002. Section 303(d) of the

Clean Water Act requires the identification of waterbodies that do not meet standards (impaired water bodies) and the development of Total Maximum Daily Loads to restore the waterbody. A TMDL identifies the pollutants of concern, and the load of each pollutant a waterbody can tolerate and still achieve the desired standards.

For the 30 years prior to the science that informed the development of the Lake Tahoe TMDL, increased nutrient loading and the resulting algal growth were thought to be primarily responsible for the declining clarity of lake Tahoe (Goldman 1988). The science for the Lake Tahoe TMDL, however, pointed not to nutrients as the primary driver of clarity loss, but to fine sediments (Jassby et al. 1999; Swift et al. 2006; Lahontan & NDEP 2010a; Sahoo et al. 2010). The work found that excess inorganic fine sediments were responsible for two-thirds of clarity loss and algal growth was responsible for the remaining third (Lahontan & NDEP 2010a). The design of the implementation framework for the Lake Tahoe TMDL established a series of load reduction benchmarks to restore the lake over 65 years. Pollutant load targets and expected improvements in lake clarity were formally adopted by the states of California and Nevada, and the federal government as the Lake Tahoe Clarity Challenge (Lahontan 2013).

The TMDL identified three pollutants of concern (fine sediment particles, nitrogen, and phosphorus) that would need to be managed to restore the historic clarity of the Lake. The TMDL also identified the sources and associated loads of those pollutants, and evaluated opportunities to reduce pollutant loading from each source (Lahontan & NDEP 2008, 2010a). The TMDL established load reduction targets necessary for each pollutant of concern (a 65% reduction in fine sediments, a 10% reduction in nitrogen, and 35% reduction in phosphorus) to restore the historic clarity of the lake. The more ambitious load reduction target for fine sediments, reflects both the primary importance of fine sediments as a driver of clarity, and the cost effectiveness of load reduction opportunities.

Prior to the development and subsequent adoption of the TMDL, the threshold standard for deep water clarity was a seasonal standard, focusing on winter clarity. After the adoption of the TMDL, TRPA aligned its threshold standard for pelagic clarity with the annual goal established in the TMDL (TRPA 2012c). While TRPA updated its goal for deep water clarity to align with the TMDL goal it did not update the associated pollutant load reduction targets to align with the TMDL pollutant load reduction targets.

Each year, TMDL program managers at the Nevada Division of Environmental Protection (NDEP) and California Lahontan Regional Water Quality Control Board (Lahontan) prepare a “Performance Report”

summarizing implementation progress from the prior year. The 2020 pollutant load reduction report found that the in 2019, implementors were achieving the required load reduction targets. The report estimated that loading from the urban uplands had reduced by 19.7% for FSP, 15.5% for phosphorus, and 11.7% for nitrogen (Lahontan & NDEP 2020).

Following the 2017 water year, the two states asked that the Tahoe Science Advisory Council (Council) complete a comprehensive review of the available data and integrate recent observations within the context of the larger understanding of the drivers of clarity. The Council's report reaffirmed the importance of pollutant loading and the influence of loading on clarity (TSAC 2020a). However, the report also suggested that climate change and ecological change may also be impacting clarity (TSAC 2020a). Subsequent work by the Council to integrate the findings of the report into regional management suggested that revisions be made to the Lake Tahoe Clarity Model. The Lake Tahoe Clarity Model provides the scientific grounding for the load reduction targets of the TMDL. The Council suggested improvements be made to enable the model to better represent physical dynamics influenced by climate change and in lake ecological processes (TSAC 2020b).

VMT AND NITROGEN

Prior to the science conducted to support development of the TMDL, increased algal growth was thought to be the primary driver of declining clarity. Nitrogen and phosphorus are nutrients that promote algal growth and excess nutrient loading was widely believed to the primary reason the clarity of the lake was declining. The Lake Tahoe Total Maximum Daily Load (TMDL) identified atmospheric deposition as the primary source of nitrogen reaching the lake (Lahontan & NDEP 2010a). Atmospheric deposition was estimated to account for 55 percent of the nitrogen reaching the lake (Lahontan & NDEP 2010a). Emissions from on-road mobile sources are estimated to account for between 37-46 percent of nitrogen emissions in the Tahoe Basin (Pollard et al. 2012).

NOX EMISSIONS

NOX is a byproduct of the high-temperature combustion of fossil fuel in engines. NO_X is emitted from automobile and truck engines, as well as off-road vehicles and other sources including power plants, and residential and industrial oil combustion. The relationship between VMT and NO_x emissions has changed significantly over the last 40 years as a result of increasingly stringent tailpipe emissions

standards, improvement in the overall fuel economy of the nation's vehicle, and changes fuel mix technology. Nationally, NOx emissions have decreased by 57 percent since 1980 despite a 49 percent increase in VMT since 1990 (TSAC 2018a). In the 1950s the average new car released 3.6 grams of NOx emissions for each mile travelled (EPA 2018).The U.S. Environmental Protection Agency (EPA) established the first NO_x emission standard (3.1 grams per mile of NOx) for cars and light duty trucks in 1975 (EPA 1999). Since that time, NO_x emissions standards per mile have become increasingly strict (Figure X). EPA tier 3 emission standards began in the 2017 vehicle model year, and grouped NO_x emissions regulation with regulation of non-methane organic gases (NMOG), and established a light duty fleet average of 0.03 g/mile(EPA 2020). Thus relative to the standards in place at the time the original threshold standard was adopted, a modern car would have to drive 103 miles to emit the same amount of NO_x as was emitted by a single mile traveled by a vehicle under the tier one standards. The new fleet average emission standards established an immediate 46 percent reduction from the tier 2 requirements and become increasingly stringent leading to a 81 percent reduction by 2025 (EPA 2014).

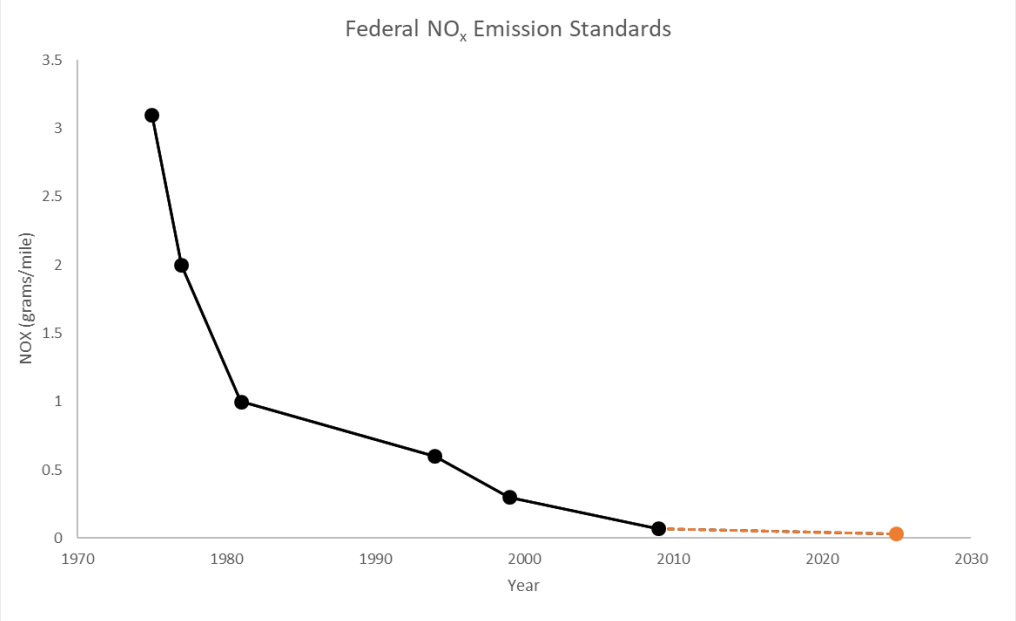


FIGURE 2: NOX EMISSIONS PER MILE EMISSIONS STANDARDS (1975-2025)

As a result of increasingly strict emission standards, the California Air Resources Board estimates that NOx emissions from mobile sources in the California side of the region have decreased from 5.7 tons/day in 2000 to 2 tons/day in 2015. Current forecasts suggest that NOx emissions will decrease

further to 0.6 tons/day by 2030 (CARB 2016). The trend suggests that current emissions are approximately 25 percent of emissions in 2000. Current forecasts suggest that NOx emissions will continue to decrease to 0.6 tons per day by 2030 (CARB 2016).

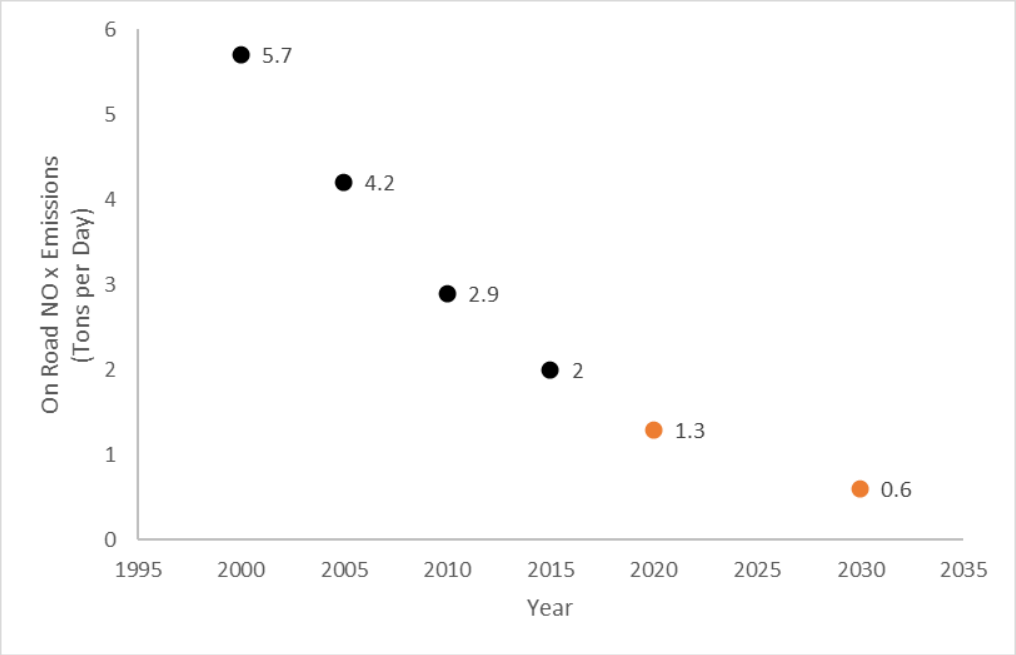


FIGURE 1: ON ROAD DAILY NO_x EMISSIONS IN THE TAHOE BASIN. SOURCE: CARB 2016

The reduction in transportation sector related NO_x emissions is the result of reduced tailpipe emissions from automobiles.

VMT BASED ATMOSPHERIC NITROGEN LOAD REDUCTION TARGET

As part of the threshold update process, TRPA considered establishing a new VMT based nitrogen load reduction target. The simplest version of this would be to recalculate the amount of VMT today that would generate 10% less NOx emission than was emitted in 1981. Because of the aforementioned reductions in emissions per mile, cars in the region could travel 90 times more vehicle miles, and still emit less NOx than a 10% reduction from 1981 emissions level. There is no realistic scenario in which that level of VMT could ever occur in the region.

Staff also considered aligning the standard with the science of the TMDL and current work to restore the clarity of the Lake. The baseline for atmospheric deposition was calculated based on emissions and

deposition estimates from 2002-2003 (Lahontan & NDEP 2008; Dolislager et al. 2012). As explained above the TMDL establishes pollutant load reduction goals relative to a 2010 baseline. The TMDL estimated that atmospheric deposition accounted for 63% of annual average nitrogen load to the lake (Lahontan & NDEP 2010a, 2010b). To restore the lake's historic clarity the TMDL established a target of reducing atmospheric deposition of nitrogen by 2% over 65 years.

At least two considerations inform potential VMT based target setting relative to the nitrogen loading to the lake. The first consideration is what portion of the atmospheric loading target should the regional VMT target be responsible for achieving. Preliminary work by the Tahoe Science Advisory Council estimated that 20% of nitrogen deposition was the result of vehicle travel within the Tahoe region (TSAC 2018b). Treating the target in absolute terms would mean that 20% of the absolute TMDL target should be achieved through in basin vehicle emissions/deposition reductions.

The second consideration is the forecast for the relationship between VMT and NOx emissions over the planning horizon. While VMT in the region has remained relatively constant since 2010, CARB estimates that NO_X emissions from on road mobile sources decreased by nearly a third between 2010 and 2015, from 2.9 tons per day in 2010 to 2.0 tons per day in 2015, and is expected to be 1.9 tons per day in 2020 (Figure 1). CARB forecasts suggest that NOx emissions will continue to decrease to 0.6 tons per day by 2030 (CARB 2016). Tier 3 national fleet average emissions standards gradually increase to full implementation by 2025 at which point NOx emissions per mile will be less than 20% of what it was under the previous requirements (EPA 2014). The TMDL load reduction target extends to 2075, and there is reason to believe that emissions per mile will be even lower at that time. Executive Order N-79-20 establishes a goal that all passenger car and trucks sold in California be zero emissions by 2035 and all trucks be zero emissions by 2045 (Newsom, Gavin 2020). Zero emissions vehicles mean there would no longer be a link between VMT and NOx emissions. Even if the goal attainment took three times longer (achieved in 45 years, not in 15), all passenger vehicles sold would be zero emission 10 years prior to the TMDL established target of 2075.

Applying the precautionary principle for both considerations would result in requiring 100% of load reduction target come from local emissions reductions and that there are no additional reductions in emissions per mile. This approach runs contrary to earlier suggestions from the Tahoe Science Advisory Council which suggested it would be reasonable to assume N emissions would continue to decline in

the future (TSAC 2018b). It also runs counter to more recent source analysis work for atmospheric N which suggested that a lower fraction of N was locally generated that was assumed by the TMDL (Lahontan & NDEP 2008; TSAC 2018b).

To establish the allowable level of VMT to still achieve the NOx emissions reduction target, regionally specific estimates for emissions per mile were compared from the 2003 (TMDL base year) and 2020. Emissions estimates were sourced from the 2017 EMFAC database utilizing aggregated emissions across model years and operation speeds (CARB 2020). Fleetwide estimates for emission reduction were developed by weighting emissions per mile emissions rates by the proportion of all vehicle miles traveled in the Region by vehicles of that category and fuel type. VMT estimates by vehicle category were generated by averaging 2003 and 2020 estimates by class, excluding electric vehicle classes not included in the 2003 EMFAC database. The exclusion of electric vehicle classes not included in 2003 EMFAC database likely results in a small underestimate in overall emissions reductions between 2003 and 2020. In 2020, VMT weighted NOx emissions per mile across all vehicle types in the region was 79.5% lower than it was in 2003 (Appendix 1). Based on the 79.5% reduction in emissions per mile, even if no additional emissions reductions were achieved, VMT in the region could increase nearly five-fold (478%) above the levels currently observed and the TMDL target could still be attained. The 478% increase above todays levels in a conservative estimate. Incorporation of the expected reductions from the current emissions standards or executive order would result in an even higher allowable level of VMT.

VMT within the Tahoe region has remained within a relatively narrow band since the 1980s, never varying by more than 15% of VMT in 1980. Given the unlikelihood of ever reaching this level of VMT, establishing a VMT based goal for rooted in concerns about nitrogen impacts on water quality is unlikely to result in meaningful action.

The conclusion that VMT is not suitable for target setting for nitrogen loading is consistent with that of the TMDL. The Lake Tahoe TMDL Pollutant Reduction Opportunity Report analyzed the potential efficacy and costs associated with those alternative pollutant load reduction methods (Lahontan & NDEP 2008). Report suggested that reducing atmospheric loads through “non-mobile” methods was far cheaper than through “mobile” methods, *“Atmospheric non-mobile costs ($35-$88 million) are orders of magnitude less than mobile costs ($2.9 to $7.2 billion) (Lahontan & NDEP 2008).”* The total cost to

achieve all load reductions necessary in the first 15 years of TMDL implementation was estimated to be $1.5 billion (Lahontan & NDEP 2010a).

VMT AND FINE SEDIMENT PARTICLES

The TMDL identified excess loading of fine sediment particles (FSP) as the primary cause of clarity loss in Lake Tahoe (Lahontan & NDEP 2010a). Unlike nitrogen, which is a byproduct of combustion, there is no direct relationship between VMT and FSP. VMT is indirectly related to FSP, in that FSP (dust) present on paved roadways can be resuspended by vehicle travel (Lahontan & NDEP 2008; Dolislager et al. 2012). The indirect relationship between vehicle travel and road dust varies based on road surface. CARB and the TMDL estimate loading from paved road surfaces based on the area of roadway surface, while loading from unpaved road surfaces is a function of VMT on the roads (Lahontan & NDEP 2008). The difference is a function of the source of FSP. On unpaved roads the road itself is the source of the FSP, while on paved roads the source is "material previously deposited" on the roadway (Lahontan & NDEP 2008). Paving roads that are currently unpaved was estimated to reduce dust emissions by 99% (Lahontan & NDEP 2008).

FSP from roads are primarily influenced by road operation and management practices and the application of winter traction material (Zhu et al. 2009). FSP and loading from Tahoe's roadways are on average five times higher in the winter than they are in the summer, and can be 10 times higher following the application of winter traction material (Zhu et al. 2009, 2011). VMT patterns in the basin are marked by an inverse seasonality pattern of FSP loading from roads. VMT in the Tahoe region is higher in the summer months, when there are more visitors in Region, and lower in the winter months (Figure 3). The observation is consistent traffic counts from the States of Nevada and California, as well the observations that informed the TMDL (Dolislager et al. 2012).

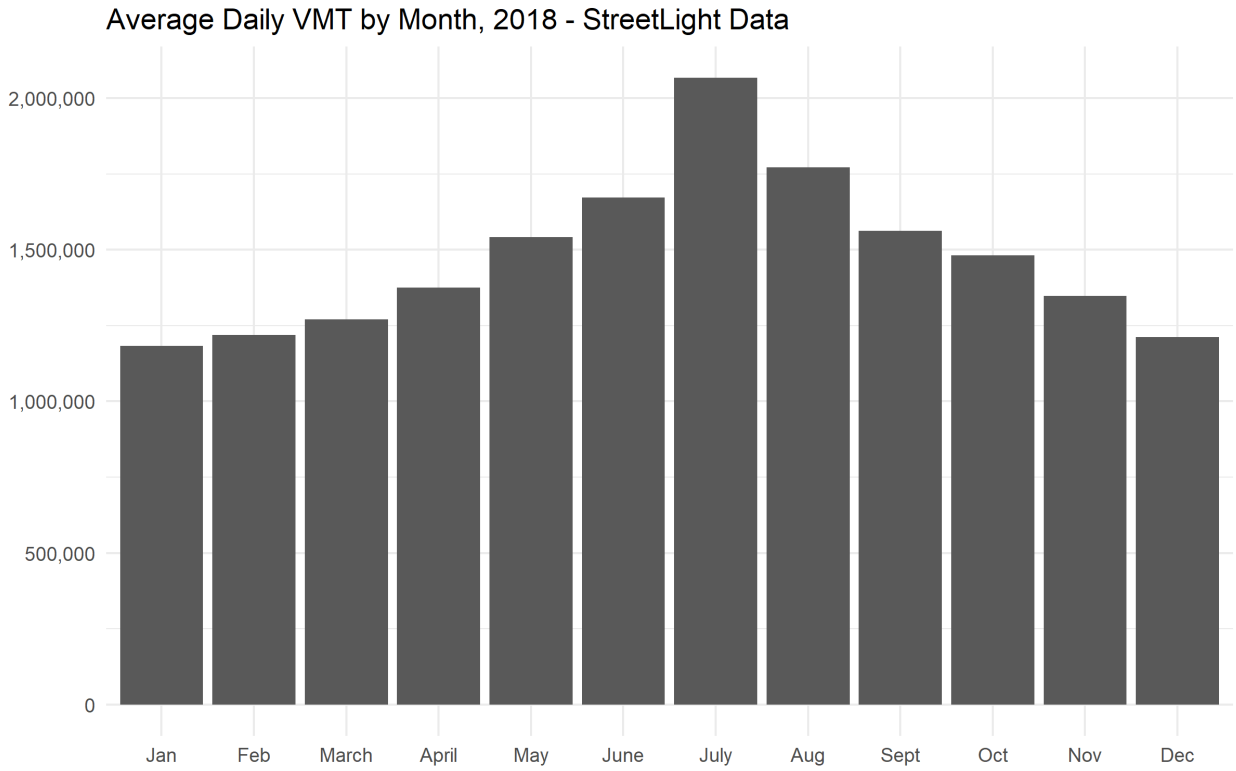


FIGURE 2: TAHOE REGION MONTHLY VMT (2018)

After adoption of the TMDL in 2010, managers and scientists continued to leverage Southern Nevada Public Land Management Act (SNPLMA) funds to augment earlier research on control and influence of the FSP from roadways. The additional research suggests that the estimates for FSP deposition to the lake from travel on paved roads may have been overestimated in the Lake Tahoe Atmospheric Deposition Study (LTADS) used in the Lake Tahoe TMDL (Zhu et al. 2011). Zhu et. al. suggest that atmospheric dry deposition may have been overestimated by 95%. "The results support much lower estimates of dry deposition to the lake than calculated by LTADS. We estimate that from paved road travel, the atmospheric dry deposition to the lake is approximately 6% of the total LTADS dry deposition (Zhu et al. 2011)." The refined estimates suggested that atmospheric dry deposition accounts for less than 1% of the TMDL estimated FSP loading to the lake (Zhu et al. 2014). The work suggested that 99% of FSP retrained as a result of vehicle traffic on paved roadways was deposited back on the landscape (Zhu et al. 2014). "Only ~2% of road emissions of PM_{10} (20 Mg/year) and ~1.5% of TSP (35 Mg/year) is

estimated to reach the lake. The vast majority of PM_{large} emitted into the air is deposited within minutes, especially in the presence of dense vegetation (Zhu et al. 2011)."

VMT BASED ATMOSPHERIC FINE SEDIMENT PARTICLE LOAD REDUCTION TARGET

The TMDL estimated that atmospheric deposition accounted for 16% of annual average FSP load to the lake (Lahontan & NDEP 2010a, 2010b). To restore the lake's historic clarity the TMDL established a target of reducing atmospheric deposition of FSP by 55% over 65 years. TMDL development considered a number of management strategies for FSP load reduction. Preliminary studies conducted for the TMDL also explored the efficacy of VMT reduction as a strategy to reduce atmospheric fine sediment loading. The preliminary understanding of the system suggested that VMT reduction would likely not be a cost-effective strategy for FSP load reduction (Lahontan & NDEP 2008). This understanding was further support by subsequent work that estimated that, "a 25 percent reduction in VMT would reduce FSP loads by less than half of one percent (Lahontan & NDEP 2008)." Instead of focusing on traffic volumes, the TMDL focused on a) preventive controls – to prevent FSP from being deposited, and mitigative controls – to remove FSP already deposited on roadways (Lahontan & NDEP 2008) for both roadways and parking lots. Because of the indirect nature of the relationship between VMT and FSP loading it is not possible to develop a meaningful VMT target for phosphorus.

VMT AND PHOSPHORUS

TMDL source analysis for atmospheric phosphorus reveals a profile similar to FSP. Phosphorus is not a by-product of combustion, so there is no direct relationship between VMT and phosphorus emissions or deposition. Phosphorus is indirectly related to VMT through road dust (Lahontan & NDEP 2008; Dolislager et al. 2012). The TMDL estimated that atmospheric deposition accounted for 18% of annual average phosphorus load to the lake (Lahontan & NDEP 2010a, 2010b). The TMDL identified three sources of atmospheric phosphorus deposited on the lake; road dust, residential wood combustion and dust from construction activities (Lahontan & NDEP 2008).

VMT BASED ATMOSPHERIC PHOSPHORUS LOAD REDUCTION TARGET

The TMDL estimated that atmospheric deposition accounted for 18% of annual average phosphorus load to the lake (Lahontan & NDEP 2010a, 2010b). To restore the lake's historic clarity the TMDL established a target of reducing atmospheric deposition of phosphorus by 61% over 65 years. Because

of the indirect nature of the relationship between VMT and phosphorus loading it is not possible to develop a meaningful VMT target for phosphorus.

DISCUSSION

TRPA has adopted nearly 200 thresholds over the years, all of which fit into one of two categories. Either they seek to protect something from degradation (WQ8-Prevent new AIS, VP1- SEZ non-degradation, VP17-Protect the Freel peak cushion plant community), or they seek to restore something that has been lost (WQ1-Clarity, F1-F3-Restore fish habitat). Perhaps the closest analog to the proposed standards are the two recreation policy statements, which direct the Regional Plan to "preserve and enhance" recreation opportunities and experiences in the region. However, even the recreation standards differ in their motivation, which was rooted a fear of losing something that once was.

The identified goals are not rooted in a fear of what could be lost, but rather hope for what is possible when the Tahoe Partnership works together. The recommended standard seeks to create something that never was. Tahoe has always been reliant on the automobile. The threshold study report for the initial environmental thresholds in 1982, wrote "Another method of providing alternatives to the automobile would be to expand pedestrian and bike facilities. Currently, these facilities are non-existent or inadequate. The most effective way to improve the existing situation would be through redevelopment that would encourage pedestrian orientation and access to transit." Attainment of the standard will implement that vision, and result in higher quality experience for all travelers in the Tahoe Region.

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APPENDIX 1: NO_X EMISSIONS PER MILE, TAHOE REGION 2003/2020

Region	Vehicle Category	Fuel	NOx Per mile (2003)	NOx Per mile (2020)	% VMT	NOx Reduction Per mile
TMPO	HHDT	GAS	11.90	2.53	0.07%	79%
TMPO	HHDT	DSL	21.77	4.84	1.81%	78%
TMPO	LDA	GAS	0.85	0.12	34.08%	86%
TMPO	LDA	DSL	1.53	0.29	0.33%	81%
TMPO	LDA	ELEC	0.00	0.00	0.24%	0%
TMPO	LDT1	GAS	1.31	0.25	10.46%	81%
TMPO	LDT1	DSL	1.55	1.45	0.02%	7%
TMPO	LDT1	ELEC	0.00	0.00	0.00%	0%
TMPO	LDT2	GAS	1.43	0.23	24.24%	84%
TMPO	LDT2	DSL	1.58	0.11	0.09%	93%
TMPO	LHDT1	GAS	1.33	0.61	3.55%	54%
TMPO	LHDT1	DSL	7.39	4.02	2.63%	46%
TMPO	LHDT2	GAS	1.33	0.45	0.36%	66%
TMPO	LHDT2	DSL	7.41	2.43	0.64%	67%
TMPO	MCY	GAS	1.33	1.29	0.73%	2%
TMPO	MDV	GAS	1.15	0.26	18.42%	78%

TMPO	MDV	DSL	1.49	0.13	0.28%	91%
TMPO	MH	GAS	2.37	1.01	0.23%	58%
TMPO	MH	DSL	10.16	5.88	0.04%	42%
TMPO	MHDT	GAS	3.30	1.82	0.30%	45%
TMPO	MHDT	DSL	13.21	4.19	1.14%	68%
TMPO	OBUS	GAS	3.48	1.13	0.09%	68%
TMPO	OBUS	DSL	19.34	5.32	0.15%	72%
TMPO	SBUS	GAS	2.88	0.42	0.01%	85%
TMPO	SBUS	DSL	13.09	10.66	0.08%	19%

APPENDIX 2: ORIGIN OF TERM "ENVIRONMENTAL THRESHOLD CARRYING CAPACITIES"

Congress amended the Bi-State Compact (Compact) in 1980 (PL 96-551; December 19, 1980) with a directive and a Compact definition (Article II (i)) to adopt standards it termed "environmental threshold carrying capacities." The Compact defined the standards as:

> *"… an environmental standard necessary to maintain a significant scenic, recreational, educational, scientific or natural value of the region or to maintain public health and safety within the region. Such standards shall include but not be limited to standards for air quality, water quality, soil conservation, vegetation preservation and noise".*

The definition included in the Compact bears little resemblance to the notion of "carrying capacity" as it is generally understood. The disconnect between and potential for confusion has been repeatedly identified and was again called out by the peer reviewers of the 2015 threshold evaluation report. One suggested changing the name entirely:

> *"..simply refer to "Threshold Standard" instead. The term "carrying capacity" has very specific meanings depending on context, and could lead to unintended interpretation."*

To avoid this confusion TRPA and partners routinely refer to "threshold standards" in keeping with the Compact definition.

The Compact directed TRPA and partners to identify appropriate environmental standards within 18 months of signing (PL 96-551, Article V(b)), and to develop and implement a Regional Plan to assure attainment or maintenance of those standards (PL 96-551, Article V(b)). TRPA initiated a 10 step process that included public comment and an environmental impact statement with an objective of developing recommendations for adopting the required standards (TRPA 1982c).

In October 1982, TRPA released a report based on the best available science at the time detailing suggested environmental threshold standards (TRPA 1982d). The report, completed within the timeframe mandated in the 1980 Compact, provided a rationale for each proposed threshold standard, summarized relevant scientific information related to the proposed standard, and provided guidance

on how attainment would be achieved (TRPA 1982). The TRPA Governing Board unanimously adopted the proposed standards via Resolution 82-11 in December 1982. The resolution established nine threshold categories that have been retained to this day and adopted multiple standards in each: air quality, fisheries, noise, recreation, scenic resources, soil conservation, vegetation preservation, water quality, and wildlife.

Historical Context

The conceptual basis for the threshold standards traces its origin to the agencies involved in the 1970s, and federal and state environmental quality legislation of the time, such as the Porter-Cologne Act in California (1969), Clean Air Act (1970), Clean Water Act (1972), Noise Control Act (1972), Endangered Species Act (1973), and Safe Drinking Water Act (1974). These national regulations along with the 1969 TRPA Compact agreement between Nevada and California (PL 91-147; December 16, 1969) likely framed the approach for standard development in Tahoe. In 1974, the EPA published a report entitled "*The Lake Tahoe Study*" which introduced the "environmental threshold" concept as a means to protect environmental quality in the Tahoe Region. According to that report, environmental thresholds would be represented by a set of parameters that specify the numerical value beyond which undesirable ecological damage occurs. In 1978, the Western Federal Regional Council (WFRC), a coalition of 11 federal agencies, signed a consensus federal policy statement for the Tahoe Region. The statement encouraged federal agencies to promote the establishment of "environmental threshold controls" to guide decision making in the Region. The federal agencies committed to policies to enhance coordination of National Forest land use planning to emphasize outdoor recreation and protection of water quality, threatened and endangered species, cultural resources, scenery, air quality, and the health of natural communities.

In 1979, the WFRC published the "*Lake Tahoe Environmental Assessment*" summarizing existing environmental and socioeconomic conditions at Lake Tahoe and exploring the feasibility of applying the environmental thresholds concept to the Tahoe Region. Chapter 7 of that assessment presented a framework for integrating environmental thresholds ("socially desirable levels of environmental quality") with the carrying capacity concept. The WFRC report proposed application of the carrying capacity concept to human populations and suggested that carrying capacities could be defined based on the environmental impacts of human activities (WFRC 1979a). The WFRC suggested integrating the

carrying capacity and environmental thresholds concepts by starting with the desired environmental conditions in the Region (environmental thresholds) and then to achieve those conditions by defining levels of development and human activity (carrying capacities) to ensure the desired environmental conditions are maintained (WFRC 1979a). The inclusion of the term "carrying capacity" in the Bi-State Compact, likely originated out of the work of the WFRC. However, the WFRC treated "Environmental Thresholds" and "Carrying Capacities" as distinct, but related, ideas and never merged the terms together in the way they appear in the Bi-State Compact.

The WFRC report suggested definitions for both "environmental thresholds" and for "carrying capacity." Environmental thresholds were defined as "end-states" for a resource (e.g., air quality, wildlife), or socially desirable levels of environmental quality. The concept of a carrying capacity emerged from the field of ecology, where it is used to describe limits on a species' population size imposed by the environment. Carrying capacities for the Tahoe region, the report suggested, should be defined as, "the maximum population and associated urban activity that a region can accommodate without exceeding environmental thresholds and without exceeding the infrastructure and mitigation cost limitations."

The WFRC suggested the "carrying capacity" and "environmental thresholds" concepts could be integrated to manage the Region by defining both the desired environmental conditions ("environmental thresholds") and levels of development and human activity ("carrying capacities") to ensure the desired environmental conditions are maintained (WFRC 1979). This was the approach ultimately made explicit in the Compact, to adopt environmental standards (Compact Article II(I)) and an implementing Regional Plan with levels of development defined as growth caps and management actions designed to achieve the adopted standards (Compact Article V(c)). The Regional Plan regulates human activities and provides a vision for desired changes in those activities (e.g., a different regional development pattern, non-auto mobility, scenic improvements, etc.), while prescribing standards that must be met to ensure that the desired environmental conditions (e.g., water quality, air quality, etc.) are attained and maintained.

Using the example of carbon monoxide, the WFRC report suggests that the desired end-state for carbon monoxide concentration could be achieved by a suite of management and mitigating actions; a) reducing the number of vehicle trips, b) increasing road capacity, c) cleaner burning automobiles, or

some combination of all three (WFRC 1979b). Within this framework, the determination of carrying capacities for impacts from human activities in the Region is a function of action to manage and mitigate the environmental impacts of those activities versus an absolute numerical limit on a given human activity. “Carrying capacity” in this context refers to the policies and programs that govern development and human activities to ensure the desired conditions are achieved.

The peer reviewers of the draft 2015 Threshold Evaluation pointed out that since its introduction, when it focused primarily on the number of people, the application of the carrying capacity concept for management of people in ecological systems has evolved substantially. A broad body of scientific study has now developed over the last four decades, generally in the field of recreation management, giving the concept robust and more nuanced meaning. Years of management experience that found that total capacity limits were “seldom the most effective way to deal with most management problems (Cole & Carlson 2010).” Today, capacity limits are no longer viewed as the preeminent management strategy, but rather one of many strategies (Marion 2016). That shift in thinking was summarized in a recent policy guidance document on the use of visitor capacity as a management tool, *“..research and managerial experience have revealed that managing the number of visitors in an area is only one tool within a suite of strategies that can be used to achieve and maintain desired conditions. Effective visitor use management is often more about managing factors such as the types, timing, and location of visitor activities and associated visitor behaviors* (IVUMC 2016a).” Current best practice is consistent with the conceptual approach defined in the Compact that look to varied environmental standards and required management actions to achieve those standards (IVUMC 2016b).


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Attachment B

Project Impact Assessment and Fee Framework

Attachment B

Project Impact Assessment and Fee Framework

TAHOE REGIONAL PLANNING AGENCY

PROJECT IMPACT ASSESSMENT AND AIR QUALITY MITIGATION FEE UPDATE

JANUARY 27, 2021

REGIONAL PLAN IMPLEMENTATION COMMITTEE
AGENDA ITEM NO. 5 & 6

Project Impact Assessment and Fee Framework

The project level transportation impact assessment and mitigation fee updates will provide a streamlined, transparent, and predictable process for projects that modify, change[1], or expand an existing or previous use resulting in additional vehicle miles traveled by screening projects that have less than a significant impact; transparently determining significant impacts and mitigations; and providing detailed analysis for significance and mitigation determination of more complex projects (Figure 1).

Goals of the modernized program include:

- Incentivizing development in low VMT areas
- Reducing greenhouse gas emissions
- Promoting mobility
- Reducing reliance on the personal automobile

The Lake Tahoe Regional Plan strives to make the Region more walkable and bikeable through improved land use and transportation solutions. TRPA's policies advance this goal by offering incentives to move development from sensitive areas into town centers.

TRPA is developing, in collaboration with Placer County, California, a project level analytical tool. The tool will use data from the TRPA Travel Demand Model to evaluate a project for impacts to transportation using the framework. Projects that are not screened from additional impact assessment will be evaluated using either the tool or the TRPA Travel Demand Model[2]. An applicant could choose to have a more detailed analysis using the TRPA model or through a pre-approved alternative traffic analysis, instead of the project tool. An applicant may choose a more detailed analysis if they believe the model would more accurately reflect the project's effect on VMT over-time or if a pre-approved alternative analysis, e.g., a market study, would provide more information than the model currently includes.

The updated tool and fees will advance implementation of the Regional Transportation Plan (RTP) by empowering applicants with information they need to design better projects and to mitigate project impacts.

The outcomes of these updates will be to reduce the approximately 7% of additional VMT from development and redevelopment within the RTP forecast. The proposed framework demonstrates consistency with the updated per capita VMT threshold standard as they will contribute to the overall effort to attain and maintain that per capita VMT reduction standard.

[1] Changes in operation include but are not limited to: expansion of gross floor area; or change in the applicable land use listed in Subparagraph 65.2.3.D, normally indicated by a substantial change in products or services provided

[2] Consultant, Fehr and Peers, evaluated the Tahoe Travel Demand Model and determined it is capable of producing VMT estimates for projects in the Tahoe Basin (Attachment B1)

The framework proposes changes to key facets of the current project impact assessment and mitigation fee processes that include:

1. Replacing Daily Vehicle Trip Ends (DVTE) with Vehicle Miles Travelled (VMT) in each process
2. Simplifying project evaluation using specific targets for land use equivalents
3. Requiring projects to mitigate their VMT through implementation of VMT mitigations and/or paying a fee
    a. Affordable, moderate, and achievable housing may be allowed without mitigations and/or paying a fee
4. Imposing a higher rate mitigation fee on significant projects that produce unmitigated VMT
5. Establishing geographic boundaries for project impact assessment
6. Defining unique projects to be assessed on a case-by-case basis
7. Resetting the mitigation fee amounts
8. Determining if any project types should be exempt from assessment and/or fees

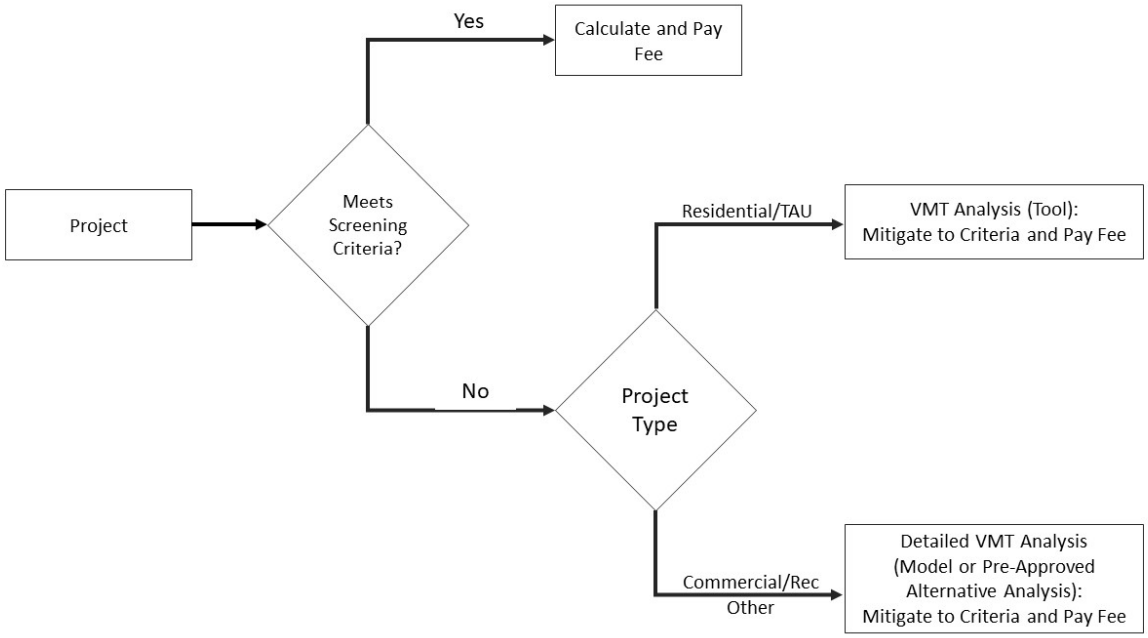


Figure 1: Propose Project Impact Assessment and Fee Update Framework

Project Impact Assessment Elements

Consultant Fehr & Peers is providing evaluation of the TRPA model, current best practices, and relevant research, and making recommendations for the project impact assessment update. Input received from the Transportation Technical Advisory Committee and individual stakeholder discussions further informed the framework and associated code changes presented here.

The most substantive elements of the updates are:

1. Standards of Significance

Establish minimum expectations for projects, and ensure all development and redevelopment are consistent with the regional goal.

2. Screening Criteria

Promote projects in town centers and areas where regional investments in VMT mitigation are focused.

3. Mobility Fee Update

Ensure projects contribute their fair share by updating the fee basis from trips to VMT and incentivize development in targeted areas.

4. Project Tool

Provide a streamlined, transparent, and predictable process that empowers applicants with information they need to design better projects.

The following section summarizes each of the facets of the project impact and mitigation fee updates.

VMT Metric

The VMT Metric is the basic unit of measurement of a project's impact to transportation. An efficiency VMT metric, which measures VMT as a ratio or rate, is most appropriate for project generated VMT, and supports goals to improve the efficiency of vehicle travel by influencing land use and transportation network decisions. Projects whose impact is better understood through its influence on total VMT over time are best evaluated by an absolute VMT metric.

Table 1 lists the proposed VMT metrics for each project type.

Table 1: VMT Metrics

Project Types	VMT Metric
Residential Uses	VMT per resident[3]
Affordable Housing	VMT per resident[3]
Tourist Accommodation Unit	VMT per overnight visitor
Public Service[4]	VMT per employee
Commercial	Total VMT
Recreation	Total VMT
Transportation Projects	Total VMT

[3] Per the US Census definition: Resident Population - All persons who are "usually resident" in a specified geographic area. Here calculated at the TAZ level

[4] Public service uses include: Religious assembly, Day care centers / pre-schools, Government offices, Hospitals, Local public health and safety facilities, Schools – college, Schools – kindergarten through secondary, Social service organizations, and threshold-related research facilities

Screening Criteria

The main goal of screening is to streamline VMT impact assessment by removing projects expected to have a less than significant impact to transportation by producing less VMT than the adopted standard of significance or by providing a beneficial outcome (e.g., affordable housing, public service use, etc.).

Screening criteria typically include small projects, such as a single-family residence, projects that would reduce trip length, such as local serving retail or affordable housing, and projects with short or no vehicle trips, such as certain transportation projects like bike paths and sidewalks. Screening can also serve to reduce the time and cost for project development when the project is consistent with adopted local and regional plans.

All projects must be consistent with adopted plans. Projects that are inconsistent with adopted plans cannot be screened and must be evaluated using the TRPA Travel Demand Model or a pre-approved alternative traffic analysis.

Screening Approach

The screening criteria were created referencing available data, various jurisdictional approaches, and the State of California's Office of Planning and Research (OPR) guidance on implementation of SB 743, which utilizes VMT for project impact assessment for environmental review in that state (Attachment D).

Exempt Projects

Three project types will be exempt from either approach:

- Single-family residences on an existing lot because they are determined to be exempt from the preparation of an environmental document (Per existing 3.2.2.A.1 of the TRPA Code of Ordinances)
- Affordable housing that is 100% deed-restricted affordable, moderate, or achievable[5] housing and is in area eligible for affordable housing bonus units because data demonstrates an association between lower VMT rates and lower household incomes[6].
- Transportation projects involving active transportation or transit because these classes of projects would likely not lead to a substantial or measurable increase in VMT:
    - Bicycle, pedestrian, and transit projects
    - New bicycle lanes or sidewalks
    - Bicycle or pedestrian improvements to the roadway system (e.g., "green lanes," bike boxes, pedestrian-activated crossings, etc.)
    - Amendments to the RTP / SCS to include new bicycle, pedestrian, and transit projects located within one-half mile of a transit stop within the boundaries of the City of South Lake Tahoe or the Regional Center, Town Center, or High-Density Tourist District
    - New bicycle, pedestrian, and transit projects not included in the RTP / SCS but which are located within one-half mile of a transit stop, within the boundaries of the City of South Lake Tahoe or within the boundaries of a Regional Center, Town Center, or the High-Density Tourist District

[5] Per 90.2 Other Terms Defined in the TRPA Code of Ordinances
[6] See: Household Income and Vehicle Fuel Economy in California (sjsu.edu) and Microsoft Word - CNT Working Paper revised 2015-12-18 kn mg edits

Small Project Screen

The current project impact assessment process identifies projects that produce less than 100 average daily trips as having an insignificant increase.

The small project screen proposes screening projects from additional analysis anywhere in the basin using the VMT equivalent of 110 average daily trips[7], an increase of 10% from the current approach, when development is less than 10,000 square feet. The VMT equivalent is calculated using the regional average trip length (6.53 miles[8]). Fees will be charged based on the project's total new VMT.

The following provides a non-exhaustive list of potential projects that would be allowed anywhere in the basin under the small projects screen:

- 11 condominiums of 900 square feet each
- 4 detached residences of 2,500 square feet each
- A small hotel addition of 13 tourist accommodation units
- 10,000 square feet of low-trip-generating service commercial use, like mini-storage

Project Type Screen

The current project impact assessment process identifies projects that produce 200 average daily trips as creating a significant increase.

The project type screen uses a VMT equivalent of 200 average daily trips, calculated using the regional average trip length (6.53 miles). Projects that are located in or within a ½ mile buffer of a Town Center or Regional Center and use parking rates that do not exceed local jurisdiction minimum parking rates and meet the defined criteria in Table 2, would not need to complete additional project impact assessment. Fees will be charged based on the project's total new VMT.

Grocery stores and drug stores are provided double the square footage because they are assumed to shorten trip lengths when built closer to customers. Town Centers are given a 20 percent trip length adjustment because trip lengths in Town Centers average about 80 percent of the basinwide average, and Regional Centers are given a 35 percent trip length adjustment because Regional Center and High-Density Tourist District are found to have a greater number of pedestrian, bicycle, and transit trips.[9]

Table 2: Location Based Screening Criteria

<table>
<tr><th>Project Types</th><th>Screening Criteria</th></tr>
<tr><td colspan="2">For projects (excluding single family residential, affordable housing, and active transportation or transit projects) to be screened, they must meet these general criteria and the following criteria for the applicable land use(s):
1) Be located in or within a ½ mile buffer of a Town Center or Regional Center
2) Use parking rates that do not exceed local jurisdiction minimum parking rates</td></tr>
<tr><td>Tourist Accommodation Unit</td><td><table><tr><td>Outside Centers</td><td>Town Centers</td><td>Regional Center</td></tr><tr><td>22 units</td><td>26 units</td><td>30 units</td></tr></table></td></tr>
</table>

[7] Consistent with the OPR Technical Advisory guidance
[8] Based on 2018 from the TRPA Travel Demand Model
[9] Per the 2018 Summer TRPA Travel Mode Share Survey

<table>
<tr><th>Project Types</th><th>Screening Criteria</th></tr>
<tr><td>Commercial</td><td>
<table>
<tr><td>Maximum Size</td><td>Outside Centers</td><td>Town Centers</td><td>Regional Center</td></tr>
<tr><td colspan="4">Food and Beverage Retail Sales (sqft):</td></tr>
<tr><td>Grocery Store</td><td>20,000</td><td>24,000</td><td>27,000</td></tr>
<tr><td>Other[10]</td><td>6,500</td><td>8,000</td><td>9,000</td></tr>
<tr><td colspan="4">Health Care Services (sqft):</td></tr>
<tr><td>Drug Store / Pharmacy</td><td>20,000</td><td>24,000</td><td>27,000</td></tr>
<tr><td>Other[10]</td><td>6,500</td><td>8,000</td><td>9,000</td></tr>
<tr><td colspan="4">Other Local-Serving Uses (sqft):</td></tr>
<tr><td></td><td>6,500</td><td>8,000</td><td>9,000</td></tr>
</table>
</td></tr>
<tr><td>Recreation[11]</td><td>
<table>
<tr><td>Maximum Size</td><td>Outside Centers</td><td>Town Centers</td><td>Regional Center</td></tr>
<tr><td>Indoor Recreation (sqft)</td><td>6,500</td><td>8,000</td><td>9,000</td></tr>
<tr><td>Outdoor Recreation (acres)</td><td>20</td><td>24</td><td>27</td></tr>
</table>
</td></tr>
<tr><td>Public Services</td><td>
<table>
<tr><td>Maximum Size</td><td>Outside Centers</td><td>Town Centers</td><td>Regional Center</td></tr>
<tr><td>Public Services (employees)</td><td>15</td><td>18</td><td>20</td></tr>
</table>
</td></tr>
</table>

Standards of Significance

Standards of significance set a defined level above which a project would have a significant transportation impact, as measured by VMT, and therefore require additional analysis and/or mitigation.

Under the current system, projects that produce:

- Fewer than 100 DVTE are considered to result in an insignificant increase and must pay the air quality mitigation fee (AQM fee)
- Between 100 and 200 DVTE are considered to have a minor impact and must mitigate that impact only if the project is being built in an urbanized portion of the Tahoe basin that is designated as a maintenance area for carbon monoxide under the federal Clean Air Act (currently, there are no designated maintenance areas in Tahoe), and pay the AQM fee

[10] Qualifying "Other" uses include: **Commercial, Retail**: Building materials and hardware; Food and beverage retail sales; Furniture, home furnishings, and equipment; General merchandise stores; Mail order and vending; Outdoor retail sales. **Commercial, Services**: Business support services; Financial services; Health care services.

- More than 200 DVTE are considered to result in a significant increase and must complete a traffic analysis, which includes VMT and Level of Service (LOS) analysis, among other factors
    - If the Region's VMT Threshold is in attainment, the project is not required to further mitigate VMT but must mitigate identified impacts to LOS, and pay the AQM fee
    - If the Region's VMT Threshold is out of attainment, the project is required to mitigate VMT and identified impacts to LOS, and pay the AQM fee

Current thinking, as well as guidance from OPR, recommends using standards of significance for residential type uses of 15% below the current average VMT Metric (e.g., VMT/Resident for Residential and VMT/Overnight Visitor for Tourist Accommodation Units); 15% below the current average VMT Metric for employment uses (e.g., VMT/employee for Public Service projects); and a no-net increase in VMT for commercial types uses (e.g., No-net increase for Commercial, No-net increase for Recreation[11]).

The framework uses sub-regional (i.e., jurisdictional[12]) standards of significance by land use type (residential, tourist accommodation uses, commercial, etc.). These standards of significance are designed to encourage applicants to reduce VMT by designing projects to include features that reduce auto travel (e.g., a mix of land uses, etc.) (Table 3). Doing so would reduce the amount of analysis and additional mitigations required of a project.

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project will lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the standards of significance described below would apply.

Mixed Use projects would be evaluated using the respective standards of significance for each of the types of land uses proposed in the application.

Table 3: Standards of Significance

Project Types	Standard of Significance
Area Plans	Evaluate each land use component independently, and apply the threshold of significance for each land use type included
Commercial	No-net VMT
Mixed Uses	Evaluate each land use component of a mixed-use project independently, and apply the threshold of significance for each land use type included
Public Services	15% below existing[8] sub-regional average VMT per employee
Recreation	No-net VMT
Residential Uses	15% below existing[8] sub-regional average VMT per resident

[11] In Tahoe, recreation land uses typically function like a commercial use and so are treated in the framework similarly

[12] Jurisdictions include: Carson City, City of South Lake Tahoe, Douglas County, El Dorado County, Placer County, and Washoe County

Project Types	Standard of Significance
Tourist Accommodation Unit	15% below existing[8] sub-regional average VMT per overnight visitor
Transportation Projects	No-net VMT

Mitigation

All projects are expected to mitigate to a less-than-significant impact through implementing appropriate VMT mitigation options and/or paying a fee. Screened projects will still be required to pay a fee. Affordable housing and transportation projects that include bicycle, pedestrian, and/or transit, are being considered for possible waiving of mitigations.

Mitigations

Mitigation strategies are those that may be used to reduce VMT associated with land use projects, land use plans, and non-active transportation projects in the Tahoe Basin.

Fehr & Peers identified the following VMT mitigation strategies, based on the draft 2020 RTP, the Placer County Resort Triangle Transportation Plan, the CAPCOA Quantifying Greenhouse Gas Mitigation Measures report, and additional research, to be appropriate to reduce project generated VMT (Attachment B 2):

- Increase Transit Accessibility
- Integrate Affordable and Below Market Rate Housing
- Improve Design of Development
- Unbundle Parking Costs from Property Cost
- Implement Market Price Public Parking
- Implement Voluntary Commute Trip Reduction Program
- Implement Required Commute Trip Reduction Program
- Provide Ride-Sharing Programs
- Implement Subsidized or Discounted Transit Program
- Encourage Telecommuting and Alternative Work Schedules
- Marketing for Commute Trip Reduction Program
- Targeted Behavioral Interventions
- Employer-Sponsored Vanpool/Shuttle
- Price Workplace Parking
- Provide Traffic Calming Measures

Mitigation Fees

The maximum possible per VMT fee amount will be determined using the rough proportionality and nexus concepts and will be calculated using regionally significant projects identified in the adopted RTP constrained project list that address new VMT in the region and the projected future VMT contributed by new development. Once the maximum fee amount is determined, a fee will be set below the maximum amount. Projects that cannot reduce VMT to at or below the corresponding standard of significance will be required to pay a higher rate fee for all unmitigated VMT. The higher rate fee will be set to reflect the cost of mitigating the additional VMT.

It is anticipated that the updated program will collect roughly the same amount of fees as the existing AQM fee program[13].

Local VMT Fees

Some jurisdictions have or could have fee programs to mitigate VMT at a local scale, e.g., Placer County's Traffic Impact Fee Program.

The allocation of funds from the TRPA mitigation fee program will take this into consideration by giving preference to projects that have additional funding sources (i.e., the local fee program revenues can be used to leverage the regional fee program revenues).

The fee will be collected by local jurisdictions that have MOUs with TRPA or by TRPA when no MOU is in place.

Use of the fees will continue to require approval by the TRPA Governing Board to ensure monies are being used towards projects identified in the Regional Transportation Plan and that reduce VMT.

Monitoring

Approaches to monitoring VMT mitigations are evolving. The National Center for Sustainable Transportation at the University of California, Davis[14] is initiating a project to develop recommendations for monitoring VMT impacts and assessing the efficacy of VMT reduction strategies at the project level. Staff have been working with this research team on a parallel effort, VMT Measurement in the Tahoe Region. The development of project impact assessment VMT mitigation monitoring will be informed by both of these efforts as they develop over time.

Tool Development

TRPA is developing a project impact assessment tool with Placer County and consultant, Fehr and Peers. The tool will assess Residential, Tourist Accommodation, and those components of a Mixed-Use project's generated VMT based on the project's land use type, location, size, and relevant attributes. The tool will be driven by data from the TRPA Travel Demand model and the proposed project that is being assessed. The tool will be available to the public, consultants, developers, and others to assist in the screening process, to assess VMT for projects that do not meet the screening criteria, and to incorporate appropriate VMT mitigations into projects determined to have a significant impact (i.e., those that exceed the thresholds of significance).

Contact Information:

For questions regarding the project impact assessment and mitigation fee update, please contact Melanie Sloan at (775) 589-5208 or msloan@trpa.org.

Attachments

B1: Tahoe Activity-Based Travel Demand Model Assessment
B2: Review of Vehicle Miles Traveled Mitigation Strategies for Use in the Tahoe Basin

[13] Approximately $400,000 per year
[14] https://ncst.ucdavis.edu/project/monitoring-vehicle-miles-traveled-reduction-claims-local-development-review

Attachment B.1

Travel Demand Model Assessment

Attachment B1

Tahoe Activity-Based Travel Demand Model Assessment Memorandum

FEHR PEERS

Memorandum

Date:	July 17, 2020
To:	Stephanie Holloway, Placer County Melanie Sloan, TRPA
From:	Rob Hananouchi, Kashfia Nehrin, & Ron Milam, Fehr & Peers
Subject:	**Tahoe Activity-Based Travel Demand Model Assessment**

RS20-3907

This memorandum presents a qualitative assessment of the Tahoe activity-based travel demand model (Tahoe AB model) based on model documentation provided by Tahoe Regional Planning Agency (TRPA) staff. This assessment uses the model documentation to assess the Tahoe AB model's capabilities of producing vehicle miles of travel (VMT) estimates for transportation impact assessment in compliance with the California Environmental Quality Act (CEQA). The results of this assessment are compared alongside previously completed assessments of the California Statewide Travel Demand Model (CSTDM) and VMT sketch planning tools. The intent of this assessment is to start a dialogue with TRPA and local agencies about the strengths and weaknesses of available tools to estimate VMT for project-scale effects in the Tahoe Basin.

Background

TRPA and local lead agencies in the Tahoe Basin need to estimate VMT for impact assessment purposes. This includes environmental impact assessment per the requirements identified in Article VII of the Tahoe Regional Planning Compact and under the California Environmental Quality Act (CEQA). Article VII requirements would apply to all projects in the Tahoe Basin while CEQA requirements apply to projects in the State of California portion of the Tahoe Basin only.

The TRPA VMT Threshold Standard was adopted in 1982 to address nitrogen oxides (NOx) tailpipe emissions from vehicles and their effect on lake clarity. Since 1982, NOx emissions from mobile sources have greatly reduced as a result of increasingly stringent tailpipe emissions standards. However, VMT

remains an important performance measure in efforts to reduce auto dependence, reduce greenhouse gases (GHG), and comply with related TRPA and California goals. Therefore, TRPA is in the process of updating its VMT Threshold Standard for assessing the VMT impacts of projects in the Tahoe Basin.

Senate Bill (SB) 743 in California initiated considerable changes to the evaluation of transportation impacts under CEQA. Specifically, SB 743 directed the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to establish new metrics for determining the significance of transportation impacts, and established that automobile delay, as described by level of service (LOS) or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment upon certification of the amended CEQA Guidelines by the Natural Resources Agency. The amended CEQA Guidelines were certified in December 2018, eliminating the use of LOS as a measure for environmental impact. The amended CEQA Guidelines also state that "generally, VMT is the most appropriate measure of transportation impacts" and require the use of VMT statewide as of July 1, 2020. The CEQA Guidelines further explain that a "lead agency may use models to estimate a project's vehicle miles traveled."

To aid in SB 743 implementation, OPR released a *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) in December 2018. The Technical Advisory acknowledges that "CEQA generally defers to lead agencies on the choice of methodology to analyze impacts." Therefore, the Technical Advisory provides "advice and recommendations," which CEQA lead agencies may use at their discretion for implementing SB 743 changes but "does not alter lead agency discretion in preparing environmental documents subject to CEQA." The Technical Advisory includes technical recommendations regarding the assessment of VMT. With regards to methodology for estimating VMT, the Technical Advisory states that "travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT. To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT." The Technical Advisory further states that "when using models and tools for [establishing thresholds of significance and estimating VMT], agencies should use comparable data and methods, in order to set up an 'apples-to-apples' comparison between thresholds, VMT estimates, and VMT mitigation estimates."

CEQA Expectations

CEQA compliance has two basic elements. The first is the legal risk of challenge associated with inadequately analyzing impacts due to use of models that do not meet benchmark expectations. The second is the mitigation risk of mis-identifying the impact and the mitigation strategies to reduce the impact. Agencies with a high risk of legal challenges will likely be concerned about both elements while

agencies with less legal risk should still be concerned about the second element since it is also relevant for all other transportation analysis based on model forecasts.

The CEQA Guidelines contain clear expectations for environmental analysis as noted below; however, the CEQA Guidelines are silent about what data, analysis methods, models, and mitigation approaches are adequate for transportation impacts.

CEQA Guidelines – Expectations for Environmental Impact Analysis

§ 15003 (F) = fullest possible protection of the environment…

§ 15003 (I) = adequacy, completeness, and good-faith effort at full disclosure…

§ 15125 (C) = EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated…

§ 15144 = an agency must use its best efforts to find out and disclose…

§ 15151 = sufficient analysis to allow a decision which intelligently takes account of environmental consequences…

All of these suggest accuracy is important and have largely been recognized by the courts as the context for judging an adequate analysis. So, then what is the basis for determining adequacy, completeness, and a good faith effort when it comes to forecasting and transportation impact analysis? A review of relevant court cases suggests the following conclusions.

- CEQA does not require the use of any specific methodology. Agencies must have substantial evidence to support their significance conclusions. (Association of Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383.)
- CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. (CEQA Guidelines, § 15204, subd. (a))
- CEQA does not require perfection in an EIR but rather adequacy, completeness and a good faith effort at full disclosure while including sufficient detail to enable those who did not participate in the EIR preparation to understand and consider meaningfully the issues raised by the project. (Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692)
- Lead agencies should not use scientifically outdated information in assessing the significance of impacts. (Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm. (2001) 91 Cal.App.4th 1344.)

- Impact analysis should improve as more and better data becomes available and as scientific knowledge evolves. (Cleveland National Forest Foundation v. San Diego Association of Governments, Cal. Supreme Ct. S223603, 2017).

These conclusions tend to reinforce the basic tenet of CEQA that requires having substantial evidence to support all aspects of the impact analysis and related decisions. Further, analysis should rely on the latest state of the practice, or even best practice methods, to provide accurate and meaningful results. This expectation is grounded in the basic purpose behind environmental regulations like CEQA that attempt to accurately identify and disclose potential impacts and to develop effective mitigation. Having accurate and reliable travel forecasts is essential for meeting these expectations. A key challenge in following the state-of-the-practice is that it can vary depending on many factors. Some of the key factors are listed below:

- Complexity of the transportation network and number of operating modes
- Available data
- Urban versus rural setting
- Planned changes in the transportation network (particularly to major roads or transit systems)
- Availability of resources to develop and apply travel demand models
- Population and employment levels
- Congestion levels
- Regulatory requirements
- Types of technical and policy questions posed by decision makers
- Desired level of confidence in the analysis findings
- Anticipated level of legal scrutiny

In California, travel forecasts are generated using various forms of models that range from simple spreadsheets based on historic traffic growth trends to complex computer models that account for numerous factors that influence travel demand. According to Transportation and Land Development, 2nd Edition, ITE, 2002, the appropriate model depends on the size of the development project and its ability to affect the surrounding area. As projects increase in size, the likelihood of needing a complex model (such as a four-step model) increases because of the number of variables that influence travel demand and transportation network operations. The study area can also influence the type of model needed especially if congestion occurs or if multiple transportation modes operate in the study area. Either of these

conditions requires robust models that can account for the myriad of travel demand responses that can occur from land use or transportation network changes.

The other relevant national guidance on model applications and forecasting is the *NCHRP Report 765, Analytical Travel Forecasting Approaches for Project-Level Planning and Design*, Transportation Research Board, 2014. This is a detailed resource with many applicable sections. A few highlights related to forecasting expectations for models are listed below.

- A travel forecasting model should be sensitive to those policies and project alternatives that the model is expected to help evaluate.
- A travel forecasting model should be capable of satisfying validation standards that are appropriate to the application.
- Project-level travel forecasts, to the extent that they follow a conventional travel model, should be validated following the guidelines of the Travel Model Validation and Reasonableness Checking Manual, Second Edition from FHWA. Similar guidelines are provided in NCHRP Report 716. This level of validation is necessary, but not sufficient, for project-level forecasts. Project-level forecasts often require better accuracy than can be obtained from a travel model alone.
- The model should be subject to frequent recalibrations to ensure that validation standards are continuously met.

Tahoe AB Model Assessment

The information above was used to as the basis for the model assessment, which includes two components. The first component is a review of model ownership and maintenance, and the second component is assessing the adequacy of the Tahoe AB model against select criteria from the guidance material above.

Model Ownership and Maintenance Assessment

Public agencies that develop travel forecasting models for planning and impact analysis must maintain those models and frequently update and recalibrate them as explained above to ensure they remain

accurate and dependable for generating travel demand forecasts. This model ownership and maintenance assessment considers whether TRPA controls the following model components.

- Model documentation – does TRPA have the Tahoe AB model development documentation and any related user guidance?
    - Yes; TRPA maintains both model development documentation and a User Guide via a Github site that is publicly accessible.
- Model files – does TRPA maintain the model input and output files?
    - Yes; TRPA maintains both model input and output files.
- Model distribution – does TRPA control the distribution of the model files to users?
    - The Tahoe AB model is accessible through TRPA's Github site to distribute to users. However, currently TRPA does not require a user agreement or strictly control distribution of the model files.

Adequacy Assessment

The following section details the assessment of the Tahoe AB model's adequacy in producing reasonable travel (i.e., VMT) forecasts. This qualitative assessment uses the following specific criteria.

- Model documentation – availability of documentation regarding the model's development including its estimation, calibration, and validation as well as a user's guide.
- Completed calibration and validation within the past 5 years – recent calibration and validation is essential for ensuring the model accurately captures evolving changes in travel behavior. Per NCHRP Report 765, "The model should be subject to frequent recalibrations to ensure that validation standards are continuously met."
- Demonstrated sensitivity to VMT effects across demographic, land use, and multimodal network changes – validation reporting will be checked for static and dynamic tests per the *2017 Regional Transportation Plan Guidelines for Metropolitan Transportation Planning Organizations*, CTC, 2017 and *Travel Model Validation and Reasonableness Checking Manual, Second Edition*, TMIP, FHWA, 2010.
- Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips – both metrics are essential for complete VMT analysis. Project-generated VMT is useful for understanding the VMT associated with the trips traveling to/from a project site. The 'project's effect on VMT' is more essential for understanding the full influence of the project since it can alter the VMT generation of neighboring land uses.

- Capable of producing regional, jurisdictional, and project-scale VMT estimates – VMT analysis for air quality, greenhouse gases, energy, and transportation impacts requires comparisons to thresholds at varying scales. For SB 743, the OPR Technical Advisory recommends thresholds based on comparisons to regional or city-wide averages.
- Level of VMT estimates that truncate trip lengths at model or political boundaries – The OPR Technical Advisory states that lead agencies should not truncate any VMT analysis because of jurisdictional or model boundaries. The intent of this recommendation is to ensure that VMT forecasts provide a full accounting of project effects.

The following matrix summarizes the assessment findings for the Tahoe AB model using these criteria.

Tahoe Activity Based Model

Screening Criteria	Screening Determination	Notes
Model Documentation	Available	Includes full overview of model, each sub-model, traffic assignment, external travel summary, and documentation of static and dynamic validation tests. Also includes User Guide.
Completed calibration and validation within the past 5 years	Yes – 2018	Static validation and calibration was conducted for 2018 conditions using Streetlight data and traffic counts. Three dynamic validation tests were also conducted.
Demonstrated sensitivity to VMT effects across demographic, land use, and multimodal network changes	No documentation of sensitivity tests for demographic changes.	Dynamic validation tests included: (1) modifying recreational attractiveness in Kings Beach, (2) adding residential units in Incline Village, and (3) increasing transit frequency. Each dynamic test revealed model outputs tended to change in the appropriate direction and magnitude for these land use and transportation changes.
	Yes – dynamic validation tests included land use and multimodal network changes.	
Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips	Project-generated VMT – Yes	As an activity (tour)-based model, the Tahoe AB model can track household and work-based tours. The model does not automatically produce home-based or home-based work VMT output. However, these trip purposes are part of individual tour and could be isolated through additional programming.
	Project effect on VMT – Yes	
	Total VMT – Yes	
	Household VMT – Yes	
	Home-based VMT – Possible	
	Work VMT – Yes	
	Home-based work VMT – Possible	

Tahoe Activity Based Model

Screening Criteria	Screening Determination	Notes
Capable of producing regional, jurisdictional, and project-scale VMT estimates	Regional VMT – Yes	Would need to review the traffic analysis zone (TAZ) system to confirm TAZ boundaries nest within jurisdictional boundaries such that jurisdictional VMT could be isolated The model documentation included three dynamic validation tests. While the model produced reasonable results in these tests, this is too small a sample to verify sufficient sensitivity to the wide variety of potential projects that may require VMT analysis.. Model users should consider performing additional dynamic tests to verify model sensitivity for their projects within their specific geographic setting before applying the model 'off the shelf'.
	Jurisdictional VMT – Likely	
	Project-scale VMT – Uncertain	
Level of VMT estimates that truncate trip lengths at model or political boundaries	Minimal	The model includes the entire Tahoe Basin. External trips at model gateways are distinguished between short-distance and long-distance trips. External trip lengths for short-distance and long-distance trips have been added to the gateways to reflect trip lengths "outside the model area." These appended external trip lengths are calibrated/ validated based on Streetlight Data. Since Streetlight Data only captures the trip length to the "next stop outside the Tahoe Basin," it does not capture the full length of trips with intermediate stops (e.g., a trip from Sacramento to South Lake Tahoe with a stop in Placerville would only capture the leg from Placerville to South Lake Tahoe).

Overall, the Tahoe AB model generally is capable of producing VMT estimates for a variety of VMT metrics (i.e., Total VMT, Household VMT, Work VMT, etc.) at the regional, jurisdictional, and project level with the following conditions.

- Jurisdictional estimates will depend on the TAZ system and how will it conforms to jurisdictional boundaries.
- Project level sensitivity should be verified with each application by performing additional dynamic validation tests. The intent is to verify sensitivity for the type of project under analysis within the specific geographic area for that project. TRPA could also perform additional tests covering the most common projects to help reduce the level of modeling needed for subsequent projects. The dynamic tests could include a range of changes from minor to major and in different contexts (i.e., rural versus small-town versus urban (South Lake Tahoe)) to confirm that both the magnitude and

direction of change in travel behavior is appropriate. Some potential dynamic test options to consider include, but are not limited to:

- Demographic changes
  - Effects of converting residential units from short-term rental (STR) use to resident occupied units
- Land Use changes
  - New residential units targeted at certain income levels (i.e., workforce housing) at various locations in the Tahoe Basin (e.g., North Shore, South Shore, etc.)
  - Recreational attractions, which could range from:
    - Visitor/tourist-oriented amenities (i.e., commercial or recreational businesses)
    - Winter-sports attraction
    - Summer-sports attraction
    - Passive recreation destination (i.e., hiking trails, mountain biking trails, parkland, etc.)
- Transportation changes
  - Road diet
  - New roadways/bridges
  - New bikeway

Additional Considerations

Depending on the type of analysis, the following characteristics of the model may cause some limitations related to its forecasts.

- The Tahoe AB model does not have a freight or goods movement component. Currently, freight trips are accounted for in trips associated with residents, visitors, and workers such that they cannot be isolated and are not sensitive to change over time.
- The model inputs generally produce forecasts for a "model day" that represents a unique time period, specifically, the first two weeks of June, last week of August, and middle two weeks of September when summer recreation activity and local school operations briefly overlap. This "model day" may not match the appropriate analysis period for CEQA compliance.

Comparison to Other Tools & Methods

Fehr & Peers previously completed a qualitative assessment of the California Statewide Travel Demand Model (CSTDM) and sketch planning tools that estimate project-scale VMT. Appendix A presents the results of this qualitative assessment.

The table below provides a comparative assessment of these tools and data sources, alongside the Tahoe AB model. For quick comparison, the main findings are color coded as follows:

- Green – model or tool generally meets criterion expectations
- Orange – model or tool partially meets criterion expectations
- Red – model does not meet criterion expectations

Comparative Assessment of VMT Tools for Tahoe Basin

Criteria	Comparative Assessment		
	Tahoe AB Model	CSTDM	Sketch Planning Tools
Sensitive to VMT effects across demographic, land use, and multimodal network changes	No documentation of sensitivity tests for demographic changes.	Documentation does not reflect any sensitivity tests for demographic or land use changes.	Ranges from limited sensitivity to demographic and land use changes to some sensitivity to land use changes.
	Partial – dynamic validation tests included land use and multimodal network changes.	Documentation reflects sensitivity test for some multimodal network changes.	Most have no to limited sensitivity to multimodal network changes.
Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips	Project-generated VMT – Yes	Project-generated VMT – No; scale is too large for project-level applications.	Most tools produce project-generated VMT estimates. Only UrbanFootprint and MXD+ are capable of producing project-effect on VMT.
	Project effect on VMT – Yes	Project effect on VMT – No; same as note above.	
	Total VMT – Yes	Total VMT – Yes	Some tools produce Total VMT only; others do household VMT only.
	Household VMT – Yes	Household VMT – Yes	
	Home-based VMT – Possible	Home-based VMT – Yes	Home-based VMT – No
	Work VMT – Yes	Work VMT – No	Work VMT – No
	Home-based work VMT – Possible	Home-based work VMT – No	Home-based work VMT – No

Comparative Assessment of VMT Tools for Tahoe Basin

Criteria	Comparative Assessment		
	Tahoe AB Model	CSTDM	Sketch Planning Tools
Capable of producing regional, jurisdictional, and project-scale VMT estimates	Regional VMT – Yes	Regional VMT – Yes	Regional VMT – No
	Jurisdictional VMT – Likely	Jurisdictional VMT – depends on jurisdiction's size and TAZ detail	Jurisdictional VMT – Most do not, but some may be able to produce for small jurisdictions.
	Project-scale VMT – Model is capable but requires verification for each project	Project-scale VMT – No; scale is too large for project-scale VMT estimates.	Project-scale VMT – Yes
Other strengths or limitations	Most detailed and locally-calibrated tool for the Tahoe Basin	Limited detail in the Tahoe Basin given the scale of the model.	Most tools can be applied relatively quickly, producing results with fewer inputs or processes than travel demand models. Some tools are dependent on subjective input of users. Most tools are not recommended for VMT calculations but could have utility for TDM mitigation evaluation. Tools are not calibrated to the Tahoe Basin.
	Model network does not extend beyond the Tahoe Basin, and therefore does not model trips with external origins or destinations (e.g., Sacramento, San Francisco Bay Area, Reno/Carson City, etc.)	Does not cover Nevada side of the Tahoe Basin. May not reflect full trip length for trips that leave California (i.e., trips to/from Nevada).	

While the Tahoe AB model has some limitations, it generally has fewer limitations than other available tools for producing VMT estimates for projects in the Tahoe Basin. Use of the model for project-scale application should include further dynamic validation tests as explained above. When a high level of confidence is desired in the model's VMT estimates, additional reasonableness checks can be made against StreetLight Data VMT estimates, which is described in further detail below.

Supplemental VMT Data

Big data vendors, such as StreetLight Data, offer VMT-specific data products that could be used to support VMT analyses. These big data vendors use anonymized location records from smart phones and

navigation devices to evaluate mobility patterns. This has several benefits when compared to baseline VMT estimates from travel forecasting models, including:

- Reflects actual travel behavior as opposed to the simulation of travel behavior generated by travel models
- Includes distinct travel behavior data over time, allowing for a breakdown by season or aggregation into a broader summary as opposed to modeling of a specific timeframe
    - This also allows for a more precise understanding for variation or changes in VMT over time (e.g., review changes resulting from a disruptive event, like the current COVID-19 pandemic).
    - Data can also be summarized over a longer time period to create a reasonable average estimate of daily VMT.

The VMT-specific data products offered by big data vendors can be used to estimate existing VMT levels for trips that travel to, from, through, and within the Tahoe Basin. Streetlight Data, in particular, offers VMT data products that produce VMT estimates for specific user-defined geographies and timeframes. Hence, customers can request VMT for a region (i.e., entire Tahoe Basin), jurisdiction (e.g., City of South Lake Tahoe), down to a specific census block group; and for a range of timeframes. This VMT data product can also disaggregate VMT into specific trip-purposes, such as work-related trips (i.e., commute trips), household or home-based trips, and visitor trips.

Since this data provides existing or past VMT-generation information, it could be used for proposed projects if those projects are generally consistent with the existing built environment characteristics (i.e., density, mix of uses, multimodal accessibility, etc.). However, it would not be appropriate to apply to proposed projects that would dramatically alter the existing demographics, land use, or multimodal transportation network.

Recommendations

This review revealed some limitations with the Tahoe AB model that can be addressed through the following model improvements.

- Address truncation of trip lengths for external trips with intermediate stops. This could be addressed by:
    - Obtaining customized smart phone/navigation device location data through a vendor to better capture the full length of the external trip tour.
    - Expanding the model network to include larger areas of Northern California and Northern Nevada that generate travel to/from the Tahoe Basin

- Add a freight component to the model to distinguish between freight travel and passenger travel
- Clearly define the required transportation 'analysis days' in the Basin and re-estimate the model to match those days
- Conduct additional dynamic tests to verify the model produces reasonable changes in VMT based on changes in demographics, land use, and transportation inputs at the project scale in various geographic locations throughout the Basin.
- Review, and if necessary, adjust TAZ boundaries to align with jurisdictional boundaries to produce model outputs by jurisdiction.
- Conduct additional reasonableness checks of the model's VMT estimates at the regional, jurisdictional, and project-scale against StreetLight Data VMT estimates based on mobile device data.

Attachment B.2

VMT Mitigations

Attachment B2

Tahoe Activity-Based Travel Demand Model Assessment Memorandum

FEHR PEERS

Memorandum

Date: November 20, 2020

To: Stephanie Holloway, Placer County
Melanie Sloan, TRPA

From: Rod Brown, Rob Hananouchi, and Ron Milam, Fehr & Peers

Subject: Review of Vehicle Miles Traveled Mitigation Strategies for Use in the Tahoe Basin

RS20-3907

Introduction

This memorandum reviews and evaluates potential mitigation strategies that may be used to reduce vehicle miles of travel (VMT) associated with land use projects, land use plans, and transportation projects in the Tahoe Basin. Three sources were reviewed for potential strategies:

- *Quantifying Greenhouse Gas Mitigation Measures*, California Air Pollution Control Officers Association (CAPCOA), August 2010
- *Lake Tahoe Regional Transportation Plan (Draft)*, TRPA, September 2020
- *Resort Triangle Transportation Plan*, Placer County, September 2020

Each of the documents reviewed for this memorandum is summarized below.

When applying mitigation strategies in the Tahoe Basin, the following factors are important to consider:

- Few studies have been conducted in areas that are similar to Tahoe, which have unique factors such as high amounts of visitor travel and large seasonality factors. Therefore, declaring that a specific strategy, or combination of strategies, will reduce VMT below a threshold of significance may pose a potential risk if this finding is challenged, unless additional data is compiled to demonstrate that the strategy will achieve the necessary VMT reduction in the Tahoe context. However, these VMT reduction strategies still should be considered when identifying measures that mitigate VMT impacts to the extent feasible.

FEHR PEERS

Memorandum

Date:	July 17, 2020
To:	Stephanie Holloway, Placer County Melanie Sloan, TRPA
From:	Rob Hananouchi, Kashfia Nehrin, & Ron Milam, Fehr & Peers
Subject:	**Tahoe Activity-Based Travel Demand Model Assessment**

RS20-3907

This memorandum presents a qualitative assessment of the Tahoe activity-based travel demand model (Tahoe AB model) based on model documentation provided by Tahoe Regional Planning Agency (TRPA) staff. This assessment uses the model documentation to assess the Tahoe AB model's capabilities of producing vehicle miles of travel (VMT) estimates for transportation impact assessment in compliance with the California Environmental Quality Act (CEQA). The results of this assessment are compared alongside previously completed assessments of the California Statewide Travel Demand Model (CSTDM) and VMT sketch planning tools. The intent of this assessment is to start a dialogue with TRPA and local agencies about the strengths and weaknesses of available tools to estimate VMT for project-scale effects in the Tahoe Basin.

Background

TRPA and local lead agencies in the Tahoe Basin need to estimate VMT for impact assessment purposes. This includes environmental impact assessment per the requirements identified in Article VII of the Tahoe Regional Planning Compact and under the California Environmental Quality Act (CEQA). Article VII requirements would apply to all projects in the Tahoe Basin while CEQA requirements apply to projects in the State of California portion of the Tahoe Basin only.

The TRPA VMT Threshold Standard was adopted in 1982 to address nitrogen oxides (NOx) tailpipe emissions from vehicles and their effect on lake clarity. Since 1982, NOx emissions from mobile sources have greatly reduced as a result of increasingly stringent tailpipe emissions standards. However, VMT

remains an important performance measure in efforts to reduce auto dependence, reduce greenhouse gases (GHG), and comply with related TRPA and California goals. Therefore, TRPA is in the process of updating its VMT Threshold Standard for assessing the VMT impacts of projects in the Tahoe Basin.

Senate Bill (SB) 743 in California initiated considerable changes to the evaluation of transportation impacts under CEQA. Specifically, SB 743 directed the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to establish new metrics for determining the significance of transportation impacts, and established that automobile delay, as described by level of service (LOS) or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment upon certification of the amended CEQA Guidelines by the Natural Resources Agency. The amended CEQA Guidelines were certified in December 2018, eliminating the use of LOS as a measure for environmental impact. The amended CEQA Guidelines also state that "generally, VMT is the most appropriate measure of transportation impacts" and require the use of VMT statewide as of July 1, 2020. The CEQA Guidelines further explain that a "lead agency may use models to estimate a project's vehicle miles traveled."

To aid in SB 743 implementation, OPR released a *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) in December 2018. The Technical Advisory acknowledges that "CEQA generally defers to lead agencies on the choice of methodology to analyze impacts." Therefore, the Technical Advisory provides "advice and recommendations," which CEQA lead agencies may use at their discretion for implementing SB 743 changes but "does not alter lead agency discretion in preparing environmental documents subject to CEQA." The Technical Advisory includes technical recommendations regarding the assessment of VMT. With regards to methodology for estimating VMT, the Technical Advisory states that "travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT. To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT." The Technical Advisory further states that "when using models and tools for [establishing thresholds of significance and estimating VMT], agencies should use comparable data and methods, in order to set up an 'apples-to-apples' comparison between thresholds, VMT estimates, and VMT mitigation estimates."

CEQA Expectations

CEQA compliance has two basic elements. The first is the legal risk of challenge associated with inadequately analyzing impacts due to use of models that do not meet benchmark expectations. The second is the mitigation risk of mis-identifying the impact and the mitigation strategies to reduce the impact. Agencies with a high risk of legal challenges will likely be concerned about both elements while

agencies with less legal risk should still be concerned about the second element since it is also relevant for all other transportation analysis based on model forecasts.

The CEQA Guidelines contain clear expectations for environmental analysis as noted below; however, the CEQA Guidelines are silent about what data, analysis methods, models, and mitigation approaches are adequate for transportation impacts.

CEQA Guidelines – Expectations for Environmental Impact Analysis

§ 15003 (F) = fullest possible protection of the environment…

§ 15003 (I) = adequacy, completeness, and good-faith effort at full disclosure…

§ 15125 (C) = EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated…

§ 15144 = an agency must use its best efforts to find out and disclose…

§ 15151 = sufficient analysis to allow a decision which intelligently takes account of environmental consequences…

All of these suggest accuracy is important and have largely been recognized by the courts as the context for judging an adequate analysis. So, then what is the basis for determining adequacy, completeness, and a good faith effort when it comes to forecasting and transportation impact analysis? A review of relevant court cases suggests the following conclusions.

- CEQA does not require the use of any specific methodology. Agencies must have substantial evidence to support their significance conclusions. (Association of Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383.)
- CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. (CEQA Guidelines, § 15204, subd. (a))
- CEQA does not require perfection in an EIR but rather adequacy, completeness and a good faith effort at full disclosure while including sufficient detail to enable those who did not participate in the EIR preparation to understand and consider meaningfully the issues raised by the project. (Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692)
- Lead agencies should not use scientifically outdated information in assessing the significance of impacts. (Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm. (2001) 91 Cal.App.4th 1344.)

- Impact analysis should improve as more and better data becomes available and as scientific knowledge evolves. (Cleveland National Forest Foundation v. San Diego Association of Governments, Cal. Supreme Ct. S223603, 2017).

These conclusions tend to reinforce the basic tenet of CEQA that requires having substantial evidence to support all aspects of the impact analysis and related decisions. Further, analysis should rely on the latest state of the practice, or even best practice methods, to provide accurate and meaningful results. This expectation is grounded in the basic purpose behind environmental regulations like CEQA that attempt to accurately identify and disclose potential impacts and to develop effective mitigation. Having accurate and reliable travel forecasts is essential for meeting these expectations. A key challenge in following the state-of-the-practice is that it can vary depending on many factors. Some of the key factors are listed below:

- Complexity of the transportation network and number of operating modes
- Available data
- Urban versus rural setting
- Planned changes in the transportation network (particularly to major roads or transit systems)
- Availability of resources to develop and apply travel demand models
- Population and employment levels
- Congestion levels
- Regulatory requirements
- Types of technical and policy questions posed by decision makers
- Desired level of confidence in the analysis findings
- Anticipated level of legal scrutiny

In California, travel forecasts are generated using various forms of models that range from simple spreadsheets based on historic traffic growth trends to complex computer models that account for numerous factors that influence travel demand. According to Transportation and Land Development, 2nd Edition, ITE, 2002, the appropriate model depends on the size of the development project and its ability to affect the surrounding area. As projects increase in size, the likelihood of needing a complex model (such as a four-step model) increases because of the number of variables that influence travel demand and transportation network operations. The study area can also influence the type of model needed especially if congestion occurs or if multiple transportation modes operate in the study area. Either of these

conditions requires robust models that can account for the myriad of travel demand responses that can occur from land use or transportation network changes.

The other relevant national guidance on model applications and forecasting is the *NCHRP Report 765, Analytical Travel Forecasting Approaches for Project-Level Planning and Design*, Transportation Research Board, 2014. This is a detailed resource with many applicable sections. A few highlights related to forecasting expectations for models are listed below.

- A travel forecasting model should be sensitive to those policies and project alternatives that the model is expected to help evaluate.
- A travel forecasting model should be capable of satisfying validation standards that are appropriate to the application.
- Project-level travel forecasts, to the extent that they follow a conventional travel model, should be validated following the guidelines of the Travel Model Validation and Reasonableness Checking Manual, Second Edition from FHWA. Similar guidelines are provided in NCHRP Report 716. This level of validation is necessary, but not sufficient, for project-level forecasts. Project-level forecasts often require better accuracy than can be obtained from a travel model alone.
- The model should be subject to frequent recalibrations to ensure that validation standards are continuously met.

Tahoe AB Model Assessment

The information above was used to as the basis for the model assessment, which includes two components. The first component is a review of model ownership and maintenance, and the second component is assessing the adequacy of the Tahoe AB model against select criteria from the guidance material above.

Model Ownership and Maintenance Assessment

Public agencies that develop travel forecasting models for planning and impact analysis must maintain those models and frequently update and recalibrate them as explained above to ensure they remain

accurate and dependable for generating travel demand forecasts. This model ownership and maintenance assessment considers whether TRPA controls the following model components.

- Model documentation – does TRPA have the Tahoe AB model development documentation and any related user guidance?
    - Yes; TRPA maintains both model development documentation and a User Guide via a Github site that is publicly accessible.
- Model files – does TRPA maintain the model input and output files?
    - Yes; TRPA maintains both model input and output files.
- Model distribution – does TRPA control the distribution of the model files to users?
    - The Tahoe AB model is accessible through TRPA's Github site to distribute to users. However, currently TRPA does not require a user agreement or strictly control distribution of the model files.

Adequacy Assessment

The following section details the assessment of the Tahoe AB model's adequacy in producing reasonable travel (i.e., VMT) forecasts. This qualitative assessment uses the following specific criteria.

- Model documentation – availability of documentation regarding the model's development including its estimation, calibration, and validation as well as a user's guide.
- Completed calibration and validation within the past 5 years – recent calibration and validation is essential for ensuring the model accurately captures evolving changes in travel behavior. Per NCHRP Report 765, "The model should be subject to frequent recalibrations to ensure that validation standards are continuously met."
- Demonstrated sensitivity to VMT effects across demographic, land use, and multimodal network changes – validation reporting will be checked for static and dynamic tests per the *2017 Regional Transportation Plan Guidelines for Metropolitan Transportation Planning Organizations*, CTC, 2017 and *Travel Model Validation and Reasonableness Checking Manual, Second Edition*, TMIP, FHWA, 2010.
- Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips – both metrics are essential for complete VMT analysis. Project-generated VMT is useful for understanding the VMT associated with the trips traveling to/from a project site. The 'project's effect on VMT' is more essential for understanding the full influence of the project since it can alter the VMT generation of neighboring land uses.

- Capable of producing regional, jurisdictional, and project-scale VMT estimates – VMT analysis for air quality, greenhouse gases, energy, and transportation impacts requires comparisons to thresholds at varying scales. For SB 743, the OPR Technical Advisory recommends thresholds based on comparisons to regional or city-wide averages.
- Level of VMT estimates that truncate trip lengths at model or political boundaries – The OPR Technical Advisory states that lead agencies should not truncate any VMT analysis because of jurisdictional or model boundaries. The intent of this recommendation is to ensure that VMT forecasts provide a full accounting of project effects.

The following matrix summarizes the assessment findings for the Tahoe AB model using these criteria.

Tahoe Activity Based Model

Screening Criteria	Screening Determination	Notes
Model Documentation	Available	Includes full overview of model, each sub-model, traffic assignment, external travel summary, and documentation of static and dynamic validation tests. Also includes User Guide.
Completed calibration and validation within the past 5 years	Yes – 2018	Static validation and calibration was conducted for 2018 conditions using Streetlight data and traffic counts. Three dynamic validation tests were also conducted.
Demonstrated sensitivity to VMT effects across demographic, land use, and multimodal network changes	No documentation of sensitivity tests for demographic changes.	Dynamic validation tests included: (1) modifying recreational attractiveness in Kings Beach, (2) adding residential units in Incline Village, and (3) increasing transit frequency. Each dynamic test revealed model outputs tended to change in the appropriate direction and magnitude for these land use and transportation changes.
	Yes – dynamic validation tests included land use and multimodal network changes.	
Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips	Project-generated VMT – Yes	As an activity (tour)-based model, the Tahoe AB model can track household and work-based tours. The model does not automatically produce home-based or home-based work VMT output. However, these trip purposes are part of individual tour and could be isolated through additional programming.
	Project effect on VMT – Yes	
	Total VMT – Yes	
	Household VMT – Yes	
	Home-based VMT – Possible	
	Work VMT – Yes	
	Home-based work VMT – Possible	

Tahoe Activity Based Model

Screening Criteria	Screening Determination	Notes
Capable of producing regional, jurisdictional, and project-scale VMT estimates	Regional VMT – Yes	Would need to review the traffic analysis zone (TAZ) system to confirm TAZ boundaries nest within jurisdictional boundaries such that jurisdictional VMT could be isolated The model documentation included three dynamic validation tests. While the model produced reasonable results in these tests, this is too small a sample to verify sufficient sensitivity to the wide variety of potential projects that may require VMT analysis.. Model users should consider performing additional dynamic tests to verify model sensitivity for their projects within their specific geographic setting before applying the model 'off the shelf'.
	Jurisdictional VMT – Likely	
	Project-scale VMT – Uncertain	
Level of VMT estimates that truncate trip lengths at model or political boundaries	Minimal	The model includes the entire Tahoe Basin. External trips at model gateways are distinguished between short-distance and long-distance trips. External trip lengths for short-distance and long-distance trips have been added to the gateways to reflect trip lengths "outside the model area." These appended external trip lengths are calibrated/ validated based on Streetlight Data. Since Streetlight Data only captures the trip length to the "next stop outside the Tahoe Basin," it does not capture the full length of trips with intermediate stops (e.g., a trip from Sacramento to South Lake Tahoe with a stop in Placerville would only capture the leg from Placerville to South Lake Tahoe).

Overall, the Tahoe AB model generally is capable of producing VMT estimates for a variety of VMT metrics (i.e., Total VMT, Household VMT, Work VMT, etc.) at the regional, jurisdictional, and project level with the following conditions.

- Jurisdictional estimates will depend on the TAZ system and how will it conforms to jurisdictional boundaries.
- Project level sensitivity should be verified with each application by performing additional dynamic validation tests. The intent is to verify sensitivity for the type of project under analysis within the specific geographic area for that project. TRPA could also perform additional tests covering the most common projects to help reduce the level of modeling needed for subsequent projects. The dynamic tests could include a range of changes from minor to major and in different contexts (i.e., rural versus small-town versus urban (South Lake Tahoe)) to confirm that both the magnitude and

direction of change in travel behavior is appropriate. Some potential dynamic test options to consider include, but are not limited to:

- Demographic changes
  - Effects of converting residential units from short-term rental (STR) use to resident occupied units
- Land Use changes
  - New residential units targeted at certain income levels (i.e., workforce housing) at various locations in the Tahoe Basin (e.g., North Shore, South Shore, etc.)
  - Recreational attractions, which could range from:
    - Visitor/tourist-oriented amenities (i.e., commercial or recreational businesses)
    - Winter-sports attraction
    - Summer-sports attraction
    - Passive recreation destination (i.e., hiking trails, mountain biking trails, parkland, etc.)
- Transportation changes
  - Road diet
  - New roadways/bridges
  - New bikeway

Additional Considerations

Depending on the type of analysis, the following characteristics of the model may cause some limitations related to its forecasts.

- The Tahoe AB model does not have a freight or goods movement component. Currently, freight trips are accounted for in trips associated with residents, visitors, and workers such that they cannot be isolated and are not sensitive to change over time.
- The model inputs generally produce forecasts for a "model day" that represents a unique time period, specifically, the first two weeks of June, last week of August, and middle two weeks of September when summer recreation activity and local school operations briefly overlap. This "model day" may not match the appropriate analysis period for CEQA compliance.

Comparison to Other Tools & Methods

Fehr & Peers previously completed a qualitative assessment of the California Statewide Travel Demand Model (CSTDM) and sketch planning tools that estimate project-scale VMT. Appendix A presents the results of this qualitative assessment.

The table below provides a comparative assessment of these tools and data sources, alongside the Tahoe AB model. For quick comparison, the main findings are color coded as follows:

- Green – model or tool generally meets criterion expectations
- Orange – model or tool partially meets criterion expectations
- Red – model does not meet criterion expectations

Comparative Assessment of VMT Tools for Tahoe Basin

Criteria	Comparative Assessment		
	Tahoe AB Model	CSTDM	Sketch Planning Tools
Sensitive to VMT effects across demographic, land use, and multimodal network changes	No documentation of sensitivity tests for demographic changes.	Documentation does not reflect any sensitivity tests for demographic or land use changes.	Ranges from limited sensitivity to demographic and land use changes to some sensitivity to land use changes.
	Partial – dynamic validation tests included land use and multimodal network changes.	Documentation reflects sensitivity test for some multimodal network changes.	Most have no to limited sensitivity to multimodal network changes.
Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for households, home-based trips, work trips, and total trips	Project-generated VMT – Yes	Project-generated VMT – No; scale is too large for project-level applications.	Most tools produce project-generated VMT estimates. Only UrbanFootprint and MXD+ are capable of producing project-effect on VMT.
	Project effect on VMT – Yes	Project effect on VMT – No; same as note above.	
	Total VMT – Yes	Total VMT – Yes	Some tools produce Total VMT only; others do household VMT only.
	Household VMT – Yes	Household VMT – Yes	
	Home-based VMT – Possible	Home-based VMT – Yes	Home-based VMT – No
	Work VMT – Yes	Work VMT – No	Work VMT – No
	Home-based work VMT – Possible	Home-based work VMT – No	Home-based work VMT – No

Comparative Assessment of VMT Tools for Tahoe Basin

Criteria	Comparative Assessment		
	Tahoe AB Model	CSTDM	Sketch Planning Tools
Capable of producing regional, jurisdictional, and project-scale VMT estimates	Regional VMT – Yes	Regional VMT – Yes	Regional VMT – No
	Jurisdictional VMT – Likely	Jurisdictional VMT – depends on jurisdiction's size and TAZ detail	Jurisdictional VMT – Most do not, but some may be able to produce for small jurisdictions.
	Project-scale VMT – Model is capable but requires verification for each project	Project-scale VMT – No; scale is too large for project-scale VMT estimates.	Project-scale VMT – Yes
Other strengths or limitations	Most detailed and locally-calibrated tool for the Tahoe Basin	Limited detail in the Tahoe Basin given the scale of the model.	Most tools can be applied relatively quickly, producing results with fewer inputs or processes than travel demand models. Some tools are dependent on subjective input of users. Most tools are not recommended for VMT calculations but could have utility for TDM mitigation evaluation. Tools are not calibrated to the Tahoe Basin.
	Model network does not extend beyond the Tahoe Basin, and therefore does not model trips with external origins or destinations (e.g., Sacramento, San Francisco Bay Area, Reno/Carson City, etc.)	Does not cover Nevada side of the Tahoe Basin. May not reflect full trip length for trips that leave California (i.e., trips to/from Nevada).	

While the Tahoe AB model has some limitations, it generally has fewer limitations than other available tools for producing VMT estimates for projects in the Tahoe Basin. Use of the model for project-scale application should include further dynamic validation tests as explained above. When a high level of confidence is desired in the model's VMT estimates, additional reasonableness checks can be made against StreetLight Data VMT estimates, which is described in further detail below.

Supplemental VMT Data

Big data vendors, such as StreetLight Data, offer VMT-specific data products that could be used to support VMT analyses. These big data vendors use anonymized location records from smart phones and

navigation devices to evaluate mobility patterns. This has several benefits when compared to baseline VMT estimates from travel forecasting models, including:

- Reflects actual travel behavior as opposed to the simulation of travel behavior generated by travel models
- Includes distinct travel behavior data over time, allowing for a breakdown by season or aggregation into a broader summary as opposed to modeling of a specific timeframe
    - This also allows for a more precise understanding for variation or changes in VMT over time (e.g., review changes resulting from a disruptive event, like the current COVID-19 pandemic).
    - Data can also be summarized over a longer time period to create a reasonable average estimate of daily VMT.

The VMT-specific data products offered by big data vendors can be used to estimate existing VMT levels for trips that travel to, from, through, and within the Tahoe Basin. Streetlight Data, in particular, offers VMT data products that produce VMT estimates for specific user-defined geographies and timeframes. Hence, customers can request VMT for a region (i.e., entire Tahoe Basin), jurisdiction (e.g., City of South Lake Tahoe), down to a specific census block group; and for a range of timeframes. This VMT data product can also disaggregate VMT into specific trip-purposes, such as work-related trips (i.e., commute trips), household or home-based trips, and visitor trips.

Since this data provides existing or past VMT-generation information, it could be used for proposed projects if those projects are generally consistent with the existing built environment characteristics (i.e., density, mix of uses, multimodal accessibility, etc.). However, it would not be appropriate to apply to proposed projects that would dramatically alter the existing demographics, land use, or multimodal transportation network.

Recommendations

This review revealed some limitations with the Tahoe AB model that can be addressed through the following model improvements.

- Address truncation of trip lengths for external trips with intermediate stops. This could be addressed by:
    - Obtaining customized smart phone/navigation device location data through a vendor to better capture the full length of the external trip tour.
    - Expanding the model network to include larger areas of Northern California and Northern Nevada that generate travel to/from the Tahoe Basin

- Add a freight component to the model to distinguish between freight travel and passenger travel
- Clearly define the required transportation 'analysis days' in the Basin and re-estimate the model to match those days
- Conduct additional dynamic tests to verify the model produces reasonable changes in VMT based on changes in demographics, land use, and transportation inputs at the project scale in various geographic locations throughout the Basin.
- Review, and if necessary, adjust TAZ boundaries to align with jurisdictional boundaries to produce model outputs by jurisdiction.
- Conduct additional reasonableness checks of the model's VMT estimates at the regional, jurisdictional, and project-scale against StreetLight Data VMT estimates based on mobile device data.

- Similarly, VMT reduction ranges associated with each mitigation measure should be applied with care, examining evidence for the calculations and its applicability to the Tahoe Basin.
- Reductions should be applied appropriately for the mitigation. Some reductions are for trips, requiring additional calculation to estimate VMT reduction. Others apply only to certain trip types, land use contexts, seasons, etc.

Quantifying Greenhouse Gas Mitigation Measures

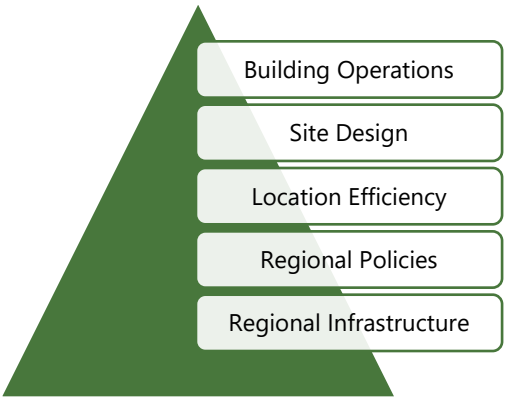
Quantifying Greenhouse Gas Mitigation Measures, released in 2010, contains many transportation demand management (TDM) strategies which may be used to reduce VMT. Fehr & Peers compiled new information published in research papers since release of the original CAPCOA report to assess the VMT effectiveness of each of these strategies. This work was documented in the Sacramento Area Council of Governments (SACOG) *Senate Bill 743 Implementation Tools* report (June 2020). Since the release of that report, Fehr & Peers has added additional research results. Attachment A lists these measures and summarizes these findings.

To demonstrate their effectiveness in an environmental analysis, TDM strategies must have sufficient evidence to quantify the level of VMT reduction that a strategy would achieve when implemented. In general, the TDM strategies can be quantified using CAPCOA calculation methodologies, but there are some important limitations for project site applications, land use context, and combining strategies as explained below.

Project Site Applications

The largest reductions in VMT (and resulting emissions) derive from regional and city-wide 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 1 presents a conceptual illustration of the relative importance of scale.

Figure 1: Transportation-Related GHG Reduction Measure Effectiveness



Source: Fehr & Peers, 2020

One limitation of TDM research that stands out is whether research findings scale to individual project sites. Research that quantifies a TDM strategy's effect on VMT reduction often measures the effect at a scale that is larger than a single project or building site. Therefore, the transferability of the measured effect to a project site may be uncertain. Attachment A includes an assessment of land use project site applicability.

Land Use Context

Another important consideration is the influence of the land use context. 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 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. Results will vary in different land use contexts. Attachment A includes notes about new research relating to land use context.

Combining VMT Reduction Strategies

Each of the CAPCOA TDM strategies can be combined with others to increase the effectiveness of VMT mitigation. For example, building sidewalks and bikeways that connect neighborhoods to transit stops may increase transit use more than transit service improvements alone. 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:

$$Total\ VMT\ Reduction = (1 - P_a) * (1 - P_b) * (1 - P_c) * \dots$$

where

$$P_x = percent\ reduction\ of\ each\ VMT\ reduction\ strategy$$

This adjustment methodology, commonly known as "multiplicative dampening," is not supported by research related to the actual effectiveness of combined strategies. The intent of including this formula is to provide a mechanism to minimize the potential to overstate the VMT reduction effectiveness.

Lake Tahoe Regional Transportation Plan

The *Lake Tahoe Regional Transportation Plan (RTP)* groups VMT reduction measures into two categories:

- Travel Demand Management (TDM): strategies to shift the travel choices people make away from the personal automobile to walking, biking, transit, and carpooling, and to visit and recreate in Tahoe during less busy travel times when there is more capacity on roadways and at recreation sites
- Transportation System Management (TSM): projects for transit, trails, technology, and communities to provide a reliable, safe, and convenient transportation system

These measures include a variety of policies, plans, and programs. RTP Appendix G, Table 7, Trip Reduction Impact Analysis (TRIA) Estimates, groups these measures into several strategies and provides the vehicle trip reduction estimated for each. Appendix G did not include supporting evidence such as citations to relevant academic literature to justify the vehicle trip reductions. Instead, this information is contained in a separate memo entitled *2020 TRIA Tool Methodology and Update Documentation*. Comments on the memo based on a cursory review are noted below:

- The TRIA adjustments are largely based on assumptions and not data reflecting specific trip reductions in the Lake Tahoe Basin. Many of the assumptions have no cited supporting evidence. Hence, the TRIA adjustments have limited confidence regarding their actual effect in the Lake Tahoe Basin. Under these circumstances, detailed monitoring of strategy performance is needed to ascertain actual effect sizes after implementation of specific strategies.
- Many TRIA adjustments rely on assumed transferability of a strategy's effect to the Lake Tahoe Basin without supporting evidence. For example, the adjustment for Intercept Lots is based on data from Alameda County, California where transit use is heavily tied to

commuter travel while the Intercept Lot is intended to reduce visitor trips. Another example is the Transit Information adjustment, which presumes that previous effects measured in Chicago would apply in the Lake Tahoe Basin. According to the memo, Chicago experienced a 1.8 percent to 2.2 percent increase in ridership due to real-time information and the full 2.2 percent was assumed to apply to Lake Tahoe where the land use context and transit market riders represent very different travel markets. However, the cited literature is for a study of real-time information effects in New York, Tampa, and Atlanta. There is a reference to Chicago effects that is used to point out the problems with previous studies where the study limitations contributed favorably to their study.

- How TRIA adjustments are applied to specific trips is not well documented. Most strategies influence specific origin-destination trip pairs. However, the memo contains limited details about how TRIA adjustments are applied. For example, the Intercept Lot reduction is applied to external trips taken by visitors according to the memo. Is this all external trips including day trip visitors? Is it external trips to all destinations in the Lake Tahoe Basin or only ones offering tourist accommodations? Another example is the adjustment taken for transit coordination. The memo describes the adjustment applying to Town Center trips. Is this all Town Center trips or just those between origin-destination pairs served by transit, which is a smaller sub-set of traffic analysis zones?
- The TRIA adjustments for TDM programs assume a target participation rate in voluntary trip reduction programs of 75-100 percent and a commute trip reduction of 5 percent based on a citation referencing the TRPA Code of Ordinances. No data or evidence from the Lake Tahoe Basin about actual participation rates or observed trip reductions was provided.
- The trip adjustments for Bicycle and Pedestrian indicate that each bicycle and pedestrian trip on a multi-use path results in a vehicle trip reduction; however, evidence was not cited to support this implication. A similar lack of evidence occurs for e-bike adjustments. It was simply assumed that e-bikes would become wide-spread throughout the Lake Tahoe Basin. Then it was further assumed that the longer distances typically travelled on an e-bike would lead to an increase in the bicycle mode split.

The text of the RTP also contains several measures not included in this table. Attachment B summarizes lists these strategies and additional measures.

Resort Triangle Transportation Plan

The *Resort Triangle Transportation Plan (RTTP)* includes transportation system recommendations for the Resort Triangle, generally defined as the area shaped by State Route (SR) 89, SR 267, and SR 28 in eastern Placer County and at the northern side of the Tahoe Basin. The RTTP presents

projects and programs that will provide more reliable and enjoyable ways to travel within the Resort Triangle. These recommendations are summarized as:

- Moving people along key corridors
- Managing parking
- Microtransit
- Encouraging commute choices

Many of the elements of these recommendations are strategies that may also reduce VMT. Attachment C lists these strategies.

Strategy Review

Fehr & Peers compared the CAPCOA strategies to the RTP and RTTP strategies. A cross-reference between the strategies is included in Attachments A, B, and C. Appendix D contains a summary of strategies recommended for the Tahoe Basin.

The Tahoe Basin has unique travel characteristics related to geography, tourism and visitors, external works, and seasonal factors. Furthermore, specific VMT reductions will vary based on the location of the project or mitigation; for example, reductions in a low-density single-family neighborhood may differ from those in a town center. VMT reductions from applying each strategy in the Tahoe Basin may therefore vary from estimates in the CAPCOA report and subsequent studies. Therefore, analysts should be particularly careful in applying trip reductions for any strategy where data about the effect is not directly available from the Lake Tahoe Basin. Ideally, trip reductions would only be applied under the following circumstances.

- The trip reduction is applied because the effect of the strategy is not captured in the model. Note that some effects are captured indirectly and should not be double counted.
- The trip reduction adjustment is based on data collected in the Lake Tahoe region, or can reasonably be applied to the Lake Tahoe region based on verifiable similarities between the data collection site and the Tahoe Basin (e.g., similar physical and human geography characteristics, demographics, economic conditions, regional travel behavior, etc.).
- The adjustment is appropriately applied to only the select trip types and/or purposes affected by the strategy (e.g., commute trip reduction strategies should only be applied to commute trips, not any other trip purpose or origin-destination (OD) trip pair.
- The adjustment is appropriately applied to the model day and specific time periods for the strategy.

As noted in the introduction of this memorandum, local data quantifying the effectiveness of specific VMT reduction strategies, as recommended above, may be challenging to obtain. Therefore, analysts should be aware that taking credit for the effectiveness of VMT reduction

strategies that are not supported by local data may increase the risk to an environmental analysis if challenged in court.

With these caveats, Attachment A includes an assessment for each strategy if its use is supported in the Tahoe Basin by the research assessment. This assessment is based on VMT research only; there may be other needs or reasons for implementing strategies which do not have data supporting VMT reduction quantification. As noted above, TRIA trip reduction estimates were generally not based on local studies and more local data is desired to justify trip reductions beyond those already accounted for in the TRPA model. Local estimates are generally preferable to estimates from other areas.

Attachment A also assesses the seasonal effectiveness of each strategy. Many strategies may be effective year-round. Other strategies, notably involving pedestrian and bicyclist facilities, will have diminished or no effectiveness during winter. Consistent snow removal can help maintain some effectiveness during winter. Local data may be used to determine effectiveness during winter.

Applying Strategies and Estimating Reductions

When applying strategies to a project or plan, the following factors should be considered:

- When a range of reductions is provided for a strategy, review the cited research and CAPCOA guide to determine the conditions most comparable to the project site and how to calculate reductions. Reductions may vary by the location of a project, land use context, size of the project, distance to key destinations, and/or other factors.
- If more than one reduction is being evaluated, apply the guidance above, Additionally, apply the guidance within the CAPCOA guide about combining measures within subcategories (pages 61-63), if appropriate.
- Limit total VMT reductions based on the land use context. According to the CAPCOA guide, the maximum possible reduction is 20 percent for a suburban center location or 15 percent for a suburban location (pages 60-61). However, these maximums are not tied to TDM effectiveness research and have not been evaluated for the Lake Tahoe Basin. Actual maximums in the Tahoe Basin are unknown.
- The Tahoe Basin, due to its large number of visitors, seasonality, land use, and other factors, has unique travel characteristics compared to typical suburban centers or general suburban contexts. Wherever possible, local data should be used when estimating VMT reductions. When applying VMT reductions based on studies from other areas, the possible effects of the Tahoe Basin's unique characteristics should be considered when estimating reductions.

VMT Reduction Programs

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 jurisdiction-scale programs to achieve VMT reductions. These program-based concepts are outlined below. The RTP includes discussion of the development of such programs. 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 these programs 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. The City of Los Angeles is the first city in California to complete a nexus study for this type of program. TRPA will also update their air quality mitigation fee program to use VMT instead of trips.
- 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 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.
- 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 addressing 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.

Table 1 compares the pros and cons of these three programs. Although implementation of any of these programs would require an upfront cost, they have several advantages over project site TDM strategies, including but not limited to the following:

- 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 or region wide land use and transportation projects, they have the potential to result in greater VMT reduction potential than site-level TDM strategies that are applied on a project-by-project basis. Additionally, these programs expand the amount of feasible mitigation for reducing VMT impacts.
- 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.

Table 1: VMT Mitigation Program Type Comparison

Program Type	Pros	Cons
Impact Fee Program	• Common and accepted practice • Accepted for CEQA mitigation • Adds certainty to development costs • Allows for regional scale mitigation projects • Increases potential VMT reduction compared to project site mitigation only	• Time consuming and expensive to develop and maintain • Requires 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 regional scale mitigation projects • Allows for mitigation projects to be in other jurisdictions • Increases potential VMT reduction compared to project site mitigation only	• Requires additionality[1] • 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 • Allows regional or state transfers • Expands mitigation options to include costs for programs, operations, and maintenance • Increases potential VMT reduction compared to project site mitigation only	• Requires additionality[1] • 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

Note: [1]Additionality: not required by law or regulation or otherwise considered part of the baseline.
Source: Fehr & Peers, 2020

Attachments

- Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies
- Attachment B: *Tahoe Basin RTP* Appendix G Table 7 (TRIA Estimates) Comparison to CAPCOA Strategies
- Attachment C: *Placer County Resort Triangle Transportation Plan* Comparison to CAPCOA Strategies

- Attachment D: Summary of Recommended CAPCOA Strategies

Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies

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CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	New Information Since CAPCOA Was Published in 2010			Tahoe Basin Review									
						New information	Updated VMT reduction compared to CAPCOA (1)	Literature or Evidence Cited	Tahoe Basin RTP Strategies				Placer County RTTP Strategies			Seasonality	Does CAPCOA or additional research support Tahoe use?	Recommended and applicable to land use	Effect measureable in model
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.	Denser land use							Year-round	Yes	Yes	Yes
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 indivdiual 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 Secondary sources: 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. Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change. Urban Land Institute. (p.88, Figure 4-30)							Year-round	Yes, for land use plans		Yes
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. For example when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. At the regional level, reductions in VMT are measured in response to changes in the entropy index of land use diversity.	1) 0%-12% 2) 0.3%-4%	1] Ewing, R. and Cervero, R. (2010). Travel and the Built Environment - A Meta-Analysis. Journal of the American Planning Association,76(3),265-294. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Frank, L., Greenwald, M., Kavage, S. and Devlin, A. (2011). An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1. Washington State Department of Transportation. Retrieved from: http://www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf Nasri, A. and Zhang, L. (2012). Impact of Metropolitan-Level Built Environment on Travel Behavior. Transportation Research Record: Journal of the Transportation Research Board, 2323(1), 75-79. Sadek, A. et al. (2011). Reducing VMT through Smart Land-Use Design. New York State Energy Research and Development Authority. Retrieved from: https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-08-29%20Final%20Report_December%202011%20%282%29.pdf Spears, S.et al. (2014). Impacts of Land-Use Mix on Passenger Vehicle Use and Greenhouse Gas Emissions- Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 2] Zhang, Wengia et al. "Short- and Long-Term Effects of Land Use on Reducing Personal Vehicle Miles of Travel."	Mixed-use development							Year-round	Yes	Yes	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.							Year-round	Yes, for land use plans		Yes

Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies

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						New Information Since CAPCOA Was Published in 2010			Tahoe Basin Review										
CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	New information	Updated VMT reduction compared to CAPCOA (1)	Literature or Evidence Cited	Tahoe Basin RTP Strategies				Placer County RTTP Strategies			Seasonality	Does CAPCOA or additional research support Tahoe use?	Recommended and applicable to land use	Effect measureable in model
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-oriented development (TOD). The project description should include, at a minimum, the following design features: • A transit station/stop with high-quality, high-frequency bus service located within a 5-10 minute walk (or roughly ¼ mile from stop to edge of development), and/or • A rail station located within a 20 minute walk (or roughly ½ mile from station to edge of development) • Fast, frequent, and reliable transit service connecting to a high percentage of regional destinations • Neighborhood designed for walking and cycling	1] 0%-5.8% 2] 0%-7.3%	1] Lund, H. et al. (2004). Travel Characteristics of Transit-Oriented Development in California. Oakland, CA: Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans. Tal, G. et al. (2013). Policy Brief on the Impacts of Transit Access (Distance to Transit) Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/transitaccess/transit_access_brief120313.pdf 2] Zamir, K. R. et al. (2014). Effects of Transit-Oriented Development on Trip Generation, Distribution, and Mode Share in Washington, D.C., and Baltimore, Maryland. Transportation Research Record: Journal of the Transportation Research Board. 2413, 45–53. DOI: 10.3141/2413-05	Enhance transit access to residential neighborhoods, school, and work locations	Transit-oriented development						Year-round	Yes	Yes	Yes
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.								Year-round	Yes	Yes	No
Land Use/ Location	3.1.7	LUT-7 - Orient Project Toward Non-Auto Corridor	NA													Summer; Diminished or no effectiveness in Winter	No (limited data)		
Land Use/ Location	3.1.8	LUT-8 Locate Project Near Bike Path/Bike Lane	NA													Summer; Diminished or no effectiveness in Winter	No (limited data)		
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	Yes	No update to CAPCOA literature; advise applying CAPCOA measure only to large developments with significant internal street structure.	Same	N/A								Year-round	Yes	Yes	No
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 - this strategy would require a project to integrate into a larger overall network of pedestrian facilities that would require local and/or regional agency coordination to implement. Current research supports city and neighborhood level VMT reductions, but none of the literature reviewed contains and evaluation of project-specific reductions.	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	Complete regional network of bike and pedestrian facilities (includes expanded bike parking)							Summer; Diminished or no effectiveness in Winter	Yes		No
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 - The requirements for the project-level definition must be met. In general, this strategy would require a project to integrate into a larger overall network of bicycle facilities that would require local and/or regional agency coordination to implement.	Reduction in VMT due to expansion of bike networks in urban areas. Strategy only applies to bicycle facilities that provide a dedicated lane for bicyclists or a completely separated right-of-way for bicycles and pedestrians. Project-level definition: Enhance bicycle network citywide (or at similar scale), such that a building entrance or bicycle parking is within 200 yards walking or bicycling distance from a bicycle network that connects to at least one of the following: at least 10 diverse uses; a school or employment center, if the project total floor area is 50% or more residential; or a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal. All destinations must be 3-mile bicycling distance from project site. Include educational campaigns to encourage bicycling.	0%-1.7%	Zahabi, S. et al. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. Transportation Research Part D: Transport and Environment. 47, 89-103.	Complete regional network of bike and pedestrian facilities (includes expanded bike parking)	Traffic calming						Summer; Diminished or no effectiveness in Winter	Yes		No
Neighborhood Site Enhancements	3.2.3	SDT-3 Implement an NEV Network	0.5%-12.7% VMT reduction for GHG-emitting vehicles, depending on level of local NEV penetration	Weak - not recommended without supplemental data.	No - the evidence supporting this strategy is limited.	Limited evidence and highly limited applicability. Use with supplemental data only.	N/A	City of Lincoln, MHM Engineers & Surveyors, Neighborhood Electric Vehicle Transportation Program Final Report, Issued 04/05/05, and City of Lincoln, A Report to the California Legislature as required by Assembly Bill 2353, Neighborhood Electric Vehicle Transportation Plan Evaluation, January 1, 2008. Cited in: California Air Pollution Control Officers Association.								Summer; Diminished or no effectiveness in Winter	No (limited data)		
Neighborhood Site Enhancements	3.2.4	SDT-4 Urban Non-Motorized Zones	NA													Summer; Diminished or no effectiveness in Winter	No (limited data)		
Neighborhood Site Enhancements	3.2.5	SDT-5 Incorporate Bike Lane Street Design (on-site)	NA						Complete regional network of bike and pedestrian facilities (includes expanded bike parking)							Summer; Diminished or no effectiveness in Winter	No (limited data)		
Neighborhood Site Enhancements	3.2.6	SDT-6 Provide Bike Parking in Non-Residential Projects	NA						Complete regional network of bike and pedestrian facilities (includes expanded bike parking)							Summer; Diminished or no effectiveness in Winter	No (limited data)		

Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies

						New Information Since CAPCOA Was Published in 2010			Tahoe Basin Review										
CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	New information	Updated VMT reduction compared to CAPCOA (1)	Literature or Evidence Cited	Tahoe Basin RTP Strategies			Placer County RTTP Strategies			Seasonality	Does CAPCOA or additional research support Tahoe use?	Recommended and applicable to land use	Effect measureable in model
Neighborhood Site Enhancements	3.2.7	SDT-7 Provide Bike Parking in Multi-Unit Residential Projects	NA						Complete regional network of bike and pedestrian facilities (includes expanded bike parking)						Summer; Diminished or no effectiveness in Winter	No (limited data)		
Neighborhood Site Enhancements	3.2.8	SDT-8 Provide EV Parking	NA												Year-round	No (limited data)		
Neighborhood Site Enhancements	3.2.9	SDT-9 Dedicate Lane for Bike Trails	NA						Complete regional network of bike and pedestrian facilities (includes expanded bike parking)						Summer; Diminished or no effectiveness in Winter	No (limited data)		
Parking Pricing	3.3.1	PDT-1 Limit Parking Supply	5%-12.5% VMT reduction in response to reduced parking supply vs. ITE parking generation rate	Weak - not recommended. Fehr & Peers has developed new estimates for residential land use only that may be used.	Yes - evidence is only available to support taking these reduction high-transit urban areas.	CAPCOA reduction range derived from estimate of reduced vehicle ownership, not supported by observed trip or VMT reductions. Evidence is available for mode shift due to presence/absence of parking in high-transit urban areas; additional investigation ongoing	Higher	Fehr & Peers estimated a linear regression formula based on observed data from multiple locations. Resulting equation produces maximum VMT reductions for residential land use only of 30% in suburban locations and 50% in urban locations based on parking supply percentage reductions.				Regional, employee-based trip reduction program			Year-round	No (applicable only to high-transit urban areas)		
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).	2%-12%	Victoria Transport Policy Institute (2009). Parking Requirement Impacts on Housing Affordability. Retrieved March 2010 from: http://www.vtpi.org/park-hou.pdf.	Parking pricing and parking management strategies including demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc.			Commercial center parking management	Regional, employee-based trip reduction program		Year-round	Yes	Yes	No
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. VMT reduction applies to VMT from visitor/customer trips only. Reductions higher than top end of range from CAPCOA report apply only in conditions with highly constrained on-street parking supply and lack of comparably-priced off-street parking.	2.8%-14.5%	Clinch, J.P. and Kelly, J.A. (2003). Temporal Variance Of Revealed Preference On-Street Parking Price Elasticity. Dublin: Department of Environmental Studies, University College Dublin. Retrieved from: http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf. Cited in Victoria Transport Policy Institute (2017). Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Hensher, D. and King, J. (2001). Parking Demand and Responsiveness to Supply, Price and Location in Sydney Central Business District. Transportation Research A. 35(3), 177-196. Millard-Ball, A. et al. (2013). Is the curb 80% full or 20% empty? Assessing the impacts of San Francisco's parking pricing experiment. Transportation Research Part A. 63(2014), 76-92. Shoup, D. (2011). The High Cost of Free Parking. APA Planners Press. p. 290. Cited in Pierce, G. and Shoup, D. (2013). Getting the Prices Right. Journal of the American Planning Association. 79(1), 67-81.	Parking pricing and parking management strategies including demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc.			Commercial center parking management	Summer recreational parking management	Winter recreational parking management (at winter resorts)	Year-round	Yes	Yes	No
Parking Pricing	3.3.4	PDT-4 Require Residential Area Parking Permits	NA						Parking pricing and parking management strategies including demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc.			Commercial center parking management			Year-round	No (limited data)		
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	Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking, and transit use incentives.)			Regional, employee-based trip reduction program			Year-round	Yes	Yes	No
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							Year-round	Yes	Yes	No
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 coordinating rides	2.5%-8.3%	Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm	Regionally implemented dynamic ridesharing (conservative implementation).			Regional, employee-based trip reduction program			Year-round	Yes	Yes	No

Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies

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CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	New Information Since CAPCOA Was Published in 2010			Tahoe Basin Review			Recommended and applicable to land use	Effect measureable in model
						New information	Updated VMT reduction compared to CAPCOA (1)	Literature or Evidence Cited	Tahoe Basin RTP Strategies	Placer County RTTP Strategies	Seasonality / Does CAPCOA or additional research support Tahoe use?		
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 - however, the effectiveness of a transit subsidy program would be building tenant specific and may require monitoring to evaluate the program's effectiveness.	1] Reduction in vehicle trips in response to reduced cost of transit use, assuming that 10 50% of new bus trips replace vehicle trips; 2] Reduction in commute trip VMT due to employee benefits that include transit 3] Reduction in all vehicle trips due to reduced transit fares system-wide, assuming 25% of new transit trips would have been vehicle trips.	1] 0.3%-14% 2] 0-16% 3] 0.1% to 6.9%	1] Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm 2] Carolina, P. et al. (2016). Do Employee Commuter Benefits Increase Transit Ridership? Evidence rom the NY-NJ Region. Washington, DC: Transportation Research Board, 96th Annual Meeting. 3] Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm	Microtransit service areas	Microtransit service; Regional, employee-based trip reduction program; Year-round	Yes	Yes	No
Commute Trip Reduction	3.4.5	TRT-5 Provide End of Trip Facilities (for bicyclists)	NA							Regional, employee-based trip reduction program; Summer; Diminished or no effectiveness in Winter	No (limited data)		
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 - however, the effectiveness of telecommuting and alternative work schedules is building tenant specific and may require monitoring to evaluate the program's effectiveness.	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	Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking, and transit use incentives.)	Regional, employee-based trip reduction program; Year-round	Yes (may be part of CTR program)	Yes	No
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 - however, the effectiveness of CTR marketing and behavioral intervention programs is building tenant specific and may require monitoring to evaluate the program's effectiveness.	1] Vehicle trips reduction due to CTR marketing; 2] Reduction in VMT from institutional trips due to targeted behavioral intervention programs	1] 0.9% to 26% 2] 1%-6%	1] Pratt, Dick. Personal communication regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies. Transit Cooperative Research Program. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Dill, J. and Mohr, C. (2010). Long-Term Evaluation of Individualized Marketing Programs for Travel Demand Management. Portland, OR: Transportation Research and Education Center (TREC). Retrieved from: http://pdxscholar.library.pdx.edu/usp_fac 2] Brown, A. and Ralph, K. (2017.) "The Right Time and Place to Change Travel Behavior: An Experimental Study." Washington, DC: Transportation Research Board, 2017 Annual Meeting.	Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking, and transit use incentives.)	Year-round	Yes (may be part of CTR program)	Yes	No
Commute Trip Reduction	3.4.8	TRT-8 Implement Preferential Parking Permit Program	NA							Winter recreational parking management (at winter resorts); Regional, employee-based trip reduction program; Year-round	No (limited data)		
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, as a supplement to trips made by non-SOV modes. Transit station-based programs focus on providing the "last-mile" solution and link transit with commuters' final destinations. Residential-based programs work to substitute entire household based trips. Employer-based programs provide a means for business/day trips for alternative mode commuters and provide a guaranteed ride home option. The reduction shown here assumes a 1%-5% penetration rate.	0.3%-1.6%	Lovejoy, K. et al. (2013). Impacts of Carsharing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm *Need to verify with more recent UCD research.*		Regional, employee-based trip reduction program; Year-round	Yes		No
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.	Applicable to school project. For residential projects, reduction to school VMT only.	Limited new evidence available, not conclusive	Same	Transportation Demand Management Institute of the Association for Commuter Transportation. TDM Case Studies and Commuter Testimonials. Prepared for the US EPA. 1997. (p. 10, 36-38) WesTrans 2015 Annual Report. Accessed on March 13, 2017 from		Year-round	Yes		No
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 - however, the effectiveness of the employer-sponsored vanpool/shuttle programs is dependent on the building tenant specific and the quality of the vanpool/shuttle service being provided. This reduction strategy may require monitoring to evaluate the program's effectiveness.	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.	Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking, and transit use incentives.)	Regional, employee-based trip reduction program; Year-round	Yes (may be part of CTR program)	Yes	No
Commute Trip Reduction	3.4.12	TRT-12 Implement Bike-Sharing Programs	NA - Grouped Strategy Minimal impacts when implemented alone. Effectiveness is heavily dependent on the location and context. Have worked well in densely populated areas with existing infrastructure for bicycling. Should be combined with Bike Lane Street Design (SDT-5) and Improve Design of Development (LUT-9).	Adequate	No - evidence currently does not show a project-specific VMT reductions, the current studies have shown city-wide VMT reductions from changes in travel modes.	Bikeshare car trip substitution rate of 7-19% based on data from Washington DC, and Minneapolis/St. Paul. Annual VMT reduction of 151,000 and 57,000, respectively. Includes VMT for rebalancing and maintenance. VMT reduction of 0.023 miles per day per bikeshare member estimated for Bay Area bikeshare, utilizing Minneapolis/St. Paul data from study above.	57,000-151,000 annual VMT reduction, based on two large US cities. VMT reduction of 0.023 miles per day per member, based on one large US city estimate.	Fishman, E., Washington, S., & Haworth, N. (2014). Bike share's impact on car use: Evidence from the United States, Great Britain, and Australia. Transportation Research Part D: Transport and Environment, 31, 13-20. TDM Methodology: Impact of Carsharing Membership, Transit Passes, Bikesharing Membership, Unbundled Parking, and Parking Supply Reductions on Driving. Center for Neighborhood Technology, Peter Haas and Cindy Copp, with TransForm staff, May 5, 2016.	Shared micromobility service areas	Regional, employee-based trip reduction program; Summer; Diminished or no effectiveness in Winter	Yes		No

Attachment A: CAPCOA Strategies, New Research Since 2010, and Tahoe RTP and RTTP Strategies

						New Information Since CAPCOA Was Published in 2010			Tahoe Basin Review										
CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	New information	Updated VMT reduction compared to CAPCOA (1)	Literature or Evidence Cited	Tahoe Basin RTP Strategies				Placer County RTTP Strategies			Seasonality	Does CAPCOA or additional research support Tahoe use?	Recommended and applicable to land use	Effect measureable in model
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.	Applicable to school project. For residential projects, reduction to school VMT only.	VMT reduction for school trips based on data beyond a single school district. School district boundaries are also a factor to consider. VMT reduction does not appear to be a factor that was considered in a select review of CA boundaries. VMT reductions apply to school trip VMT only.	5%-30%	Wilson, E., et al. (2007). The implications of school choice on travel behavior and environmental emissions. Transportation Research Part D: Transport and Environment 12(2007), 506-518.								Year-round	Yes		Yes
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 - however, the effectiveness of pricing workplace parking could be building tenant specific and may require monitoring to evaluate the program's effectiveness.	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	Parking pricing and parking management strategies including demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc.				Commercial center parking management			Year-round	Yes	Yes	No
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 - however, the effectiveness of employee parking cash-out could be building tenant specific and may require monitoring to evaluate the program's effectiveness.	Shoup case studies indicate a reduction in commute vehicle trips due to implementing cash-out without implementing other trip-reduction strategies.	3%-7.7%	Shoup, D. (1997). Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies. Transport Policy. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/research/apr/past/93-308a.pdf. This citation was listed as an alternative literature in CAPCOA.								Year-round	No (limited data)		
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								Year-round	No (more appropriate for urban areas)		
Transit System	3.5.2	TST-2 Implement Transit Access Improvements	NA						Enhance transit access to residential neighborhoods, school, and work locations							Year-round	No (limited data)		
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	Intra-regional transit capital projects within the Tahoe Basin; currently this only includes south shore water taxi service)	Inter-regional transit service that extends outside the Tahoe Basin.	Intercept lots at entrances to the Tahoe Basin providing frequent shuttle service into the Region.	Microtransit service areas	Microtransit service			Year-round	Yes		Yes
Transit System	3.5.4	TST-4 Increase Transit Service Frequency/ Speed	0.02%-2.5% VMT reduction due to reduced headways and increased speed and reliability	Adequate	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	Intra-regional transit capital projects within the Tahoe Basin; currently this only includes south shore water taxi service)	Inter-regional transit service that extends outside the Tahoe Basin.	Transit priority access		Corridor improvements (for transit)			Year-round	Yes		Yes
Transit System	3.5.5	TST-5 Provide Bike Parking Near Transit	NA						Complete regional network of bike and pedestrian facilities (includes expanded bike parking)							Summer; Diminished or no effectiveness in Winter	No (limited data)		
Transit System	3.5.6	TST-6 Provide Local Shuttles	NA													Year-round	No (limited data)		
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								Year-round	No (limited data)		
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.										Year-round	No (limited data)		
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.										Year-round	Yes, as part of VMT exchange or bank		
Road Pricing/ Management	3.6.4	RPT-4 Install Park-and-Ride Lots	NA													Year-round	No (limited data)		

NOTES:
NA indicates original data was too limited to recommend strategy, and no new data was found
(1) For specific VMT reduction ranges, refer to the cited literature.

Attachment B: Tahoe Basin RTP Appendix G Table 7 (TRIA Estimates) Comparison to CAPCOA Strategies

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Additional RTP strategies not listed in Table 7 also included.

Vehicle Trip Reduction Strategy	Primary Source of Reduced Vehicle Trips	Vehicle Trip Types Impacted	Employer Type	2035 Percent Reductions in Vehicle Trips	2045 Percent Reductions in Vehicle Trips	Comparable CAPCOA Strategies							VMT Reduction (1)	Comment
Active Transportation														
Complete regional network of bike and pedestrian facilities (includes expanded bike parking)	Increased bike and pedestrian mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips of 3 miles or less.	Regional Trips	--	1.12%	1.19%	SDT-1 Provide Pedestrian Network Improvements	SDT-2 Provide Traffic Calming Measures	SDT-5 Incorporate Bike Lane Street Design (on-site)	SDT-6 Provide Bike Parking in Non-Residential Projects	SDT-7 Provide Bike Parking in Multi-Unit Residential Projects	SDT-9 Dedicate Lane for Bike Trails	TST-5 Provide Bike Parking Near Transit	0.5%-5.7%	
Shared micromobility service areas	Reduced vehicle trips due to use of shared micromobility devices (e.g., e-scooters or shared e-bikes)	Regional Trips	--	0.53%	0.53%	TRT-12 Implement Bike-Sharing Programs							VMT reduction of 0.023 miles per day per member	
Promotion of electric bicycle use	Reduced vehicle trips due to the widespread use of electric bicycles	Regional Trips	--	0.79%	0.79%	[none]								
Public Transit Service														
Intra-regional transit capital projects within the Tahoe Basin; currently this only includes south shore water taxi service)	Increased transit mode share, partially drawn from former vehicle trips.	Regional Trips	--	0.51%	1.64%	TST-3 Expand Transit Network	TST-4 Increase Transit Service Frequency/ Speed						0.1%-10.5% or more (1)	
Inter-regional transit service that extends outside the Tahoe Basin.	Reduced commuter and recreational trips.	External Trips	--	0.51%	1.64%	TST-3 Expand Transit Network	TST-4 Increase Transit Service Frequency/ Speed						0.1%-10.5% or more (1)	
Intercept lots at entrances to the Tahoe Basin providing frequent shuttle service into the Region.	Reduced visitor trips.	External Trips	--	2.80%	2.80%	TST-3 Expand Transit Network							0.1%-10.5%	
Microtransit service areas	Reduced trips for all types served by Microtransit service areas.	Regional Trips	--	0.28%	0.45%	TRT-4 Implement Subsidized or Discounted Transit Program	TST-3 Expand Transit Network						0-16% or more (1)	Presumed free based on RTP description
ITS Technologies														
Improved transit coordination between local and regional providers, through simplified trip planning (for example Google Transit).	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Town Center Trips	--	0.68%	0.68%	[none]								

Attachment B: Tahoe Basin RTP Appendix G Table 7 (TRIA Estimates) Comparison to CAPCOA Strategies

FEHR PEERS

Additional RTP strategies not listed in Table 7 also included.

Vehicle Trip Reduction Strategy	Primary Source of Reduced Vehicle Trips	Vehicle Trip Types Impacted	Employer Type	2035 Percent Reductions in Vehicle Trips	2045 Percent Reductions in Vehicle Trips	Comparable CAPCOA Strategies							VMT Reduction (1)	Comment
Improved transit coordination between local and regional providers, through the elimination or shortened wait time of transfers, improvements to ticketing structure and agency cooperation to eliminate "transfer anxiety".	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Town Center Trips	--	0.08%	0.10%	[none]								
Real-time arrival information at transit stops, online, and/or via web-enabled mobile devices.	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	Town Center Trips	--	0.04%	0.04%	[none]								
Enhanced transit trip planning (for example Google Transit).	Increased transit mode share for trips in the corridor/district served by the project, partially drawn from former vehicle trips.	External Trips	--	0.43%	0.42%	[none]								
Regionally implemented dynamic ridesharing (conservative implementation).	Reduced commuter and recreational trips.	External Trips	--	1.00%	1.00%	TRT-3 Provide Ride-Sharing Programs							2.5%-8.3%	
TDM Measures														
Improve existing employer vehicle trip reduction program (carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, parking, and transit use incentives.)	Reduced peak-hour commuter trips.	Town Center Trips	New Employers	1.86%	1.86%	TRT-1 Implement CTR Program - Voluntary	TRT-6 Encourage Telecommuting and Alternative Work Schedules	1] TRT-7 Implement CTR Marketing 2] Launch Targeted Behavioral Interventions	TRT-11 Provide Employer-Sponsored Vanpool/ Shuttle				1.0%-6.0%	
		Town Center Trips	Existing Employers	0.82%	0.82%									
Parking Management														
Parking pricing and parking management strategies including demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc.	Reduced trip generation from managed on- and off-street parking spaces for trips to and from managed areas. Reduced demand due to reduced parking spaces as a result of shared parking requirements or changes to parking standards for new development.	Town Center Trips	--	1.22%	1.22%	PDT-2 Unbundle Parking Costs from Property Cost	PDT-3 Implement Market Price Public Parking	PDT-4 Require Residential Area Parking Permits	TRT-14 Price Workplace Parking				0.5%-14% or more (1)	
Additional strategies from RTP, not included in Table 7														
Enhance transit access to residential neighborhoods, school, and work locations						LUT-5 Increase Transit Accessibility	TST-2 Implement Transit Access Improvements						1] 0%-5.8% 2] 0%-7.3%	

Attachment B: Tahoe Basin RTP Appendix G Table 7 (TRIA Estimates) Comparison to CAPCOA Strategies

FEHR PEERS

Additional RTP strategies not listed in Table 7 also included.

Vehicle Trip Reduction Strategy	Primary Source of Reduced Vehicle Trips	Vehicle Trip Types Impacted	Employer Type	2035 Percent Reductions in Vehicle Trips	2045 Percent Reductions in Vehicle Trips	Comparable CAPCOA Strategies							VMT Reduction (1)	Comment
Education and encouragement programs for biking and walking						[none]								Presumed separate from commute trip reduction program
Marketing travel options for recreational travel						[none]								Presumed separate from commute trip reduction program
Transit priority access						TST-4 Increase Transit Service Frequency/ Speed							0.3%-6.3%	
Mixed-use development						LUT-3 Increase Diversity of Urban and Suburban Developments							1] 0%-12% 2] 0.3%-4%	
Transit-oriented development						LUT-5 Increase Transit Accessibility							1] 0%-5.8% 2] 0%-7.3%	
Mitigation strategies and fee programs to reduce VMT						RPT-3 Require Project Contributions to Transportation Infrastructure Improvement Projects								
Traffic calming						SDT-2 Provide Traffic Calming Measures							0%-1.7%	
Denser land use						LUT-1 Increase Density							0.4% -10.75%	

NOTE:

(1) VMT reduction ranges refer to the cited literature in Attachment A. Where multiple CAPCOA strategies apply, reductions may vary depending on implementation as noted.

Attachment C: Placer County Resort Triangle Transportation Plan Comparison to CAPCOA Strategies

FEHR PEERS

Strategy	Detail	Comparable CAPCOA Strategies											VMT Reduction (1)
Corridor improvements (for transit)	Signal priority modifications, queue jump lanes, bus-only lanes or HOV 4+/HOT lanes)	TST-4 Increase Transit Service Frequency/ Speed											0.3%-6.3%
Commercial center parking management	Includes paid parking and residential permit parking, parking flexibility in the commercial core, and unbundled parking	PDT-2 Unbundle Parking Costs from Property Cost	PDT-3 Implement Market Price Public Parking	PDT-4 Require Residential Area Parking Permits	TRT-14 Price Workplace Parking								2.8%-14.5% or more (1)
Summer recreational parking management	Paid parking at summer beach and recreational parking areas	PDT-3 Implement Market Price Public Parking											2.8%-14.5%
Winter recreational parking management (at winter resorts)	Expansion or implementation of paid parking, expansion of carpool parking capacity and/or increasing the existing 3+ carpool parking to 4+, establishing a paid parking space reservation system	PDT-3 Implement Market Price Public Parking	TRT-8 Implement Preferential Parking Permit Program										2.8%-14.5%
Microtransit service	Fare-free, on-demand	TRT-4 Implement Subsidized or Discounted Transit Program	TST-3 Expand Transit Network										0-16% or more (1)
Regional, employee-based trip reduction program	Incorporating a variety of TDM strategies	PDT-1 Limit Parking Supply	PDT-2 Unbundle Parking Costs from Property Cost	TRT-1 Implement CTR Program - Voluntary	TRT-3 Provide Ride Sharing Programs	TRT-4 Implement Subsidized or Discounted Transit Program	TRT-5 Provide End of Trip Facilities (for bicyclists)	TRT-6 Encourage Telecommuting and Alternative Work Schedules	TRT-8 Implement Preferential Parking Permit Program	TRT-9 Implement Car-Sharing Program	TRT-11 Provide Employer-Sponsored Vanpool/ Shuttle	TRT-12 Implement Bike-Sharing Programs	0.2-14% or more (1)

NOTE:

(1) VMT reduction ranges refer to the cited literature in Attachment A. Where multiple CAPCOA strategies apply, reductions may vary depending on implementation as noted. Quantifying Greenhouse Gas Mitigation Measures (CAPCOA) contains additional guidance about combining strategies within a subcategory (pages 61-63).

Attachment D: Summary of Recommended CAPCOA Strategies

FEHR PEERS

CAPCOA Strategy	Updated VMT reduction compared to CAPCOA (1)	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	Seasonality	In RTP or RTTP strategies?
Project-Level Strategies					
LUT-1 Increase Density	0.4% -10.75%	Adequate	Yes - however, the project must increase residential or employment density by at least 10%.	Year-round	Yes
LUT-3 Increase Diversity of Urban and Suburban Developments	1] 0%-12% 2] 0.3%-4%	Adequate	Yes	Year-round	Yes
LUT-4 Increase Destination Accessibility	0.5%-12%	Adequate	Yes	Year-round	No
LUT-5 Increase Transit Accessibility	1] 0%-5.8% 2] 0%-7.3%	Adequate	Yes - the project must include the TOD design features.	Year-round	Yes
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 [CAPCOA]	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.	Year-round	No
LUT-9 Improve Design of Development	3.0% - 21.3% reduction in VMT due to increasing intersection density vs. typical ITE suburban development [CAPCOA]	Adequate	Yes	Year-round	No
PDT-2 Unbundle Parking Costs from Property Cost	2.6% -13% VMT reduction due to decreased vehicle ownership rates [CAPCOA]	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.	Year-round	Yes
PDT-3 Implement Market Price Public Parking	2.8%-5.5% VMT reduction due to "park once" behavior and disincentive to driving [CAPCOA]	Adequate	Yes - however, the VMT reductions would only apply to visitor or customer trips.	Year-round	Yes
TRT-1 Implement CTR Program - Voluntary	1.0%-6.2% commute VMT reduction due to employer-based mode shift program [CAPCOA]	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.	Year-round	Yes
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 [CAPCOA]	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.	Year-round	No
TRT-3 Provide Ride-Sharing Programs	1%-15% commute VMT reduction due to employer ride share coordination and facilities [CAPCOA]	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.	Year-round	Yes
TRT-4 Implement Subsidized or Discounted Transit Program	0.3%-20% commute VMT reduction due to transit subsidy of up to $6/day [CAPCOA]	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 a transit subsidy program would be building tenant specific and may require monitoring to evaluate the program's effectiveness.	Year-round	Yes
TRT-6 Encourage Telecommuting and Alternative Work Schedules	0.07%-5.5% commute VMT reduction due to reduced commute trips [CAPCOA]	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 telecommuting and alternative work schedules is building tenant specific and may require monitoring to evaluate the program's effectiveness.	Year-round	Yes
1] TRT-7 Implement CTR Marketing 2] Launch Targeted Behavioral Interventions	0.8%-4.0% commute VMT reduction due to employer marketing of alternatives [CAPCOA]	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 CTR marketing and behavioral intervention programs is building tenant specific and may require monitoring to evaluate the program's effectiveness.	Year-round	No

Attachment D: Summary of Recommended CAPCOA Strategies

FEHR PEERS

CAPCOA Strategy	Updated VMT reduction compared to CAPCOA (1)	Strength of Substantial Evidence for CEQA Impact Analysis?	Applicable to Individual Land Use Projects?	Seasonality	In RTP or RTTP strategies?
TRT-11 Provide Employer-Sponsored Vanpool/Shuttle	0.3%-13.4% commute VMT reduction due to employer-sponsored vanpool and/or shuttle service [CAPCOA]	#N/A	#N/A	Year-round	Yes
TRT-14 Price Workplace Parking	0.1%-19.7% commute VMT reduction due to mode shift [CAPCOA]	Adequate - Effectiveness is building/tenant specific.	Yes - however, the effectiveness of pricing workplace parking could be building tenant specific and may require monitoring to evaluate the program's effectiveness.	Year-round	Yes
RPT-3 Require Project Contributions to Transportation Infrastructure Improvement Projects	NA - Grouped Strategy [CAPCOA]	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.	Year-round	No
SDT-2 Provide Traffic Calming Measures	0.25%-1% VMT reduction due to traffic calming on streets within and around the development [CAPCOA]	Adequate	Potentially yes - The requirements for the project-level definition must be met. In general, this strategy would require a project to integrate into a larger overall network of bicycle facilities that would require local and/or regional agency coordination to implement.	Summer; Diminished or no effectiveness in Winter	Yes
TRT-10 Implement a School Pool Program	7.2%-15.8% reduction in school VMT due to school pool implementation [CAPCOA]	Adequate - School VMT only.	Applicable to school project. For residential projects, reduction to school VMT only.	Year-round	No
TRT-13 Implement School Bus Program	5%-30%	Adequate - School VMT only.	Applicable to school project. For residential projects, reduction to school VMT only.	Year-round	No
Regional-Level Strategies					
LUT-2 Increase Location Efficiency	Elasticity -0.05 to -0.25 VMT percent reduction per 1 percent increase in regional accessibility	Adequate	No	Year-round	No
TRT-9 Implement Car-Sharing Program	0.3%-1.6%	Adequate	No - this strategy would require local and/or regional agency coordination to implement.	Year-round	Yes
TST-3 Expand Transit Network	0.1%-10.5%	Adequate	No - expanding the transit network would require local and/or regional agency coordination to implement.	Year-round	Yes
TST-4 Increase Transit Service Frequency/Speed	#N/A	#N/A	#N/A	Year-round	Yes
SDT-1 Provide Pedestrian Network Improvements	0.5%-5.7%	Adequate	No - this strategy would require a project to integrate into a larger overall network of pedestrian facilities that would require local and/or regional agency coordination to implement. Current research supports city and neighborhood level VMT reductions, but none of the literature reviewed contains and evaluation of project-specific reductions.	Summer; Diminished or no effectiveness in Winter	Yes
Bikeshare	57,000-151,000 annual VMT reduction, based on two large US cities. VMT reduction of 0.023 miles per day per member, based on one large US city estimate.	Not a current CAPCOA strategy	No - evidence currently does not show a project-specific VMT reductions, the current studies have shown city-wide VMT reductions from changes in travel modes.	Summer; Diminished or no effectiveness in Winter	Yes

NOTE:
(1) VMT reduction ranges refer to the cited literature in Attachment A. Where multiple CAPCOA strategies apply, reductions may vary depending on implementation as noted. Quantifying Greenhouse Gas Mitigation Measures (CAPCOA) contains additional guidance about combining strategies within a subcategory (pages 61-63).

Attachment C

Placer County December 1, 2020 Memorandum to Board of Supervisors from Ken Grehm and Steve Pedretti re: Vehicle Miles Traveled Thresholds for California Environmental Quality Act (Senate Bill 743)

Attachment C

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M E M O R A N D U M
DEPARTMENT OF PUBLIC WORKS and
COMMUNITY DEVELOPMENT RESOURCE AGENCY
County of Placer

TO: Board of Supervisors DATE: December 1, 2020

FROM: Ken Grehm, Director of Public Works
Steve Pedretti, Director, Community Development Resource Agency

BY: Katie Jackson, Associate Civil Engineer
Nikki Streegan, Senior Planner

SUBJECT: Vehicle Miles Traveled Thresholds for California Environmental Quality Act (Senate Bill 743)

ACTIONS REQUESTED

1. Adopt a resolution to establish thresholds, screening criteria and associated Transportation Study Guidelines for Vehicle Miles Traveled (VMT).
2. Find the action exempt under CEQA Guidelines Sections 15378(b)(5), 15061(b)(3), and Section 15268(a).

BACKGROUND

In 2013, California's Governor signed Senate Bill 743 (SB 743), which established Vehicle Miles Traveled (VMT) as the required metric for transportation impacts for most projects under the California Environmental Quality Act (CEQA) under Public Resources Code Section 21099. The legislative intent of SB 743 is 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 (GHG) emissions. In an effort to further these goals, instead of analyzing how a land development or transportation project changes road congestion, traffic impacts are analyzed based on how the project changes the number of vehicle trips and trip lengths, measured in VMT.

The shift to analysis of transportation impacts through effects on VMT was driven largely by California's air quality and climate change goals. The State has found that it will not be possible to achieve its emissions goals for 2030 and beyond without reducing GHG emissions from transportation and changing how communities and transportation systems are planned, funded, and built. In December 2018, California's Natural Resources Agency certified and adopted revisions to the CEQA Guidelines Section 15064.3, including changes to the transportation section required by SB 743. The CEQA Guidelines identified VMT as the appropriate metric to replace level of service (LOS) for evaluating a project's transportation impacts on the environment. The Governor's Office of Planning and Research (OPR) has provided guidance (Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018), which provides guidance for analysis, but also recognizes that lead agencies have the authority to establish their own thresholds.

Additionally, while LOS can no longer be used to determine significant transportation impacts under CEQA, local agencies can still use LOS as part of General Plan policies, conditions of approval, and other planning requirements.

In 2019, Placer County began working on its SB 743 Implementation Plan with support from the consulting firm Fehr & Peers. The project has included input from the Department of Public Works, Community Development Resource Agency, Environmental Coordination Services, and County Counsel. Technical workshops were held in Eastern and Western Placer County on February 26, 2020 and March 16, 2020, respectively, to discuss the process and options. The item was presented to the Board of Supervisors on May 19, 2020 and to the Planning Commission on May 28, 2020 and public comment was received at both of these meetings. At the May 19, 2020 meeting, the Board provided the following feedback:

- Meet the intent of the law and create flexibility
- Embrace the Board's vision for development
- Create guidance and certainty for all projects, including approved projects (e.g. Specific Plans)
- Consider approach with regional perspective
- Explore a blend between (previously presented) Options 2 and 3

The options discussed below were developed based on OPR's guidance, best industry practice, and thresholds adopted by other similar jurisdictions. The threshold options also take into account Placer County's various land use settings and location of planned future growth. Staff conducted analysis by evaluating case study projects throughout the county and measured each threshold option against the goals identified for this project.

DISCUSSION

Thresholds and screening criteria for VMT need to be established in order to evaluate a project's impact. Thresholds are numerical maximum values for VMT. If a project results in a VMT value greater than the adopted threshold, the project would have a significant impact and feasible mitigation would be required. Screening criteria can be established for projects that are presumed to have a less than significant impact or projects that are expected to have a beneficial impact. If a project reflects characteristics identified in the established screening criteria, the impact on VMT would be considered less than significant and a complete VMT analysis would not be required. As noted previously, Placer County has discretion to establish local thresholds and screening criteria supported by substantial evidence.

Screening Criteria Options

VMT impact assessment can be divided into two different categories: project screening or complete modeling analysis. The purpose of the screening criteria is to determine if a project is likely to result in less than significant VMT impacts, without requiring further analysis. OPR's Technical Advisory provides recommended screening criteria; however, staff evaluated expanding the OPR recommended screening criteria based on factors unique to Placer County, including trip length data, local housing needs, and additional uses that function similar to local serving retail. The following options are presented for adoption, and the merits of expanding OPR's recommended screening criteria are described further below.

Option 1: OPR's Recommended Screening Criteria	Option 2: Expanded Screening Criteria
• Projects under 110 average daily trips (ADT)	• Projects under 110 ADT or 880 daily VMT
• Deed-restricted affordable housing	• Deed-restricted affordable housing and Below Market Rate Housing in East Placer region (unincorporated areas east of Donner Summit, excluding the Tahoe Basin)
• Local serving retail under 50,000 square feet	• Local serving retail and other local serving uses under 50,000 square feet
• Projects located in low VMT generating areas	• Projects located in low VMT generating areas

Addition of 880 VMT

OPR's Technical Advisory recommends a minimum project size for VMT analysis of 110 ADT, roughly the equivalent of an 11-lot subdivision. This screening criteria is solely based on trip generation and does not take trip length into account. As an alternative, Placer County proposes to expand this screening criteria based on local trip length data derived from the California Household Travel Survey (CHTS). For example, projects that generate under 880 daily VMT include the following:

- 17 or fewer single-family dwelling units
- 22 or fewer multi-family dwelling units

- 10,000 square feet or less of office uses
- 22,200 square feet or less of light industrial uses
- 63,200 square feet or less of warehouse uses

Addition of Below Market Rate Housing in East Placer Region
The OPR Technical Advisory recommends screening deed-restricted affordable housing; however, in addition to this criteria, Placer County is proposing to include Below Market Rate Housing in the East Placer Region (unincorporated areas east of Donner Summit, excluding the Tahoe Basin). While VMT thresholds specific to East Placer will be adopted at a separate time, in the interim, the following expansion to the screening criteria would pertain to East Placer, excluding the Tahoe Basin.

Below Market Rate Housing refers to properties that are leased or sold at prices that are below the current market rate. This includes deed-restricted housing and housing that is affordable by design such as multi-family housing. Such units may, or may not, feature deed-restrictions that limit occupancy to income qualifying households (i.e., income-restricted). These units are proposed to be included in the screening criteria because they are created for local workforce by-design, leading to a VMT reduction.

Based on data in the 2016 North Tahoe Truckee Regional Housing Needs Assessment and the 2020 Analysis of Proposed Eastern and Western Placer County Voluntary Deed Restriction Programs, there is a need for more housing to match the jobs in that region. As such, if more Below Market Rate Housing were developed in East Placer where there is a need, additional workforce could be accommodated and trips resulting from housing outside of the region would be reduced.

Addition of Local Serving Uses
OPR's Technical Advisory notes that retail projects tend to redistribute existing shopping trips rather than create new trips. Local serving retail projects can serve to shorten trip lengths for existing trips, thereby reducing VMT. This reasoning holds true for a variety of local serving uses, beyond retail projects. Additionally, local serving uses are generally less than 50,000 square feet in size. As such, neighborhood or local serving uses that are already identified in the zoning code are included as part of the expanded criteria.

Low VMT Generating Areas
Maps of low VMT generating areas can be used to evaluate a proposed project. Projects that are generally consistent in size and land use type compared to their surrounding built environment (i.e., land use type, access to the circulation network, scale, etc.) will have similar VMT values to the existing land uses near the project site. If a project is located in an area with VMT per capita or VMT per employee that is less than or equal to the threshold established for that sub-region, then the project is considered to be located in a low VMT area and can be presumed to have a less than significant impact. No change is proposed relative to this provision for screening and a forthcoming screening tool will help users identify whether the project is located in a low VMT area.

<u>Threshold Options</u>
The OPR Technical Advisory recommends thresholds for three land use types within Metropolitan Planning Organizations (MPOs): residential, office and retail. For residential and office projects, OPR recommends a threshold of 15% below the regional baseline for VMT/capita and VMT/employee, respectively. For retail projects, OPR suggests that a net increase in VMT may be considered a significant impact. Under OPR's recommended threshold, projects in Placer County would be compared to similar existing projects throughout the SACOG or TRPA regions. OPR's recommended thresholds are not appropriate for Placer County because they do not achieve the full legislative intent of SB 743, and would result in unintended consequences in Placer County, as described in Appendix C of the Transportation Study Guidelines. As such, the following threshold options are presented for adoption for Western Placer County, and the merits of each are described further below.

Option 1: 15% below unincorporated County baseline
Under Option 1 projects in Western Placer County would be evaluated against a threshold of 15% below the unincorporated Placer County baseline for VMT per capita, VMT per employee, and other applicable VMT metrics. Retail projects would be evaluated against a threshold of no net increase in VMT.

Under this threshold option, all discretionary projects in unincorporated Placer County would be evaluated against a threshold of 15% below the unincorporated county baseline for similar projects. For example, a new residential subdivision would be evaluated against existing residential throughout unincorporated Placer County. If the VMT anticipated due to the subdivision is 15% or more below the countywide average, the project's VMT impact would be considered less than significant. Use of the unincorporated average is appropriate since that is the geography over which the County has authority for land use and transportation decisions. The OPR Technical Advisory recognizes that retail projects can reduce total VMT by providing shopping destinations closer to homes and workplaces. As such, OPR recommends a threshold of no net increase in VMT for retail projects.

The approach aims to reduce GHG emissions by dissuading growth in rural areas and encouraging growth closer to the incorporated cities, job centers, and developing areas, and is the most consistent with the OPR Technical Advisory guidance because it facilitates growth in developing and established areas of the County (i.e. Granite Bay, North Auburn, Placer Vineyards, Riolo Vineyards, etc.) where trip lengths are shorter. However, this threshold could be difficult to achieve in rural areas of the county due to longer trip lengths and lack of alternative transportation modes. This approach is not sensitive to the variety of different land use contexts in Placer County. This threshold has been adopted by many other agencies throughout California, including El Dorado County.

Option 2: Sub-Regional Approach
Under Option 2, the following thresholds would be applied based on the location of the project:

- Established and Developing: 15% below the unincorporated County baseline for VMT per capita, VMT per employee, or other applicable VMT metric. No net increase in VMT for retail projects.
- Rural East: 5% below the sub-region's baseline VMT per capita for residential and less than or equal to the sub-region's baseline VMT per employee for non-residential. No net increase in VMT for retail projects.
- Rural West: 10% below the sub-region's baseline VMT per capita for residential and less than or equal to the sub-region's baseline VMT per employee for non-residential. No net increase in VMT for retail projects.

The sub-regions for Western Placer County were established based on land use context. Established areas are characterized by an existing mix of residential and non-residential land use, higher density development, and a well-defined roadway network. Developing areas are planned growth areas, where substantial new land development and roadways are expected to be built over the next several decades. Developing areas include West Placer/Dry Creek, Sunset Area, Regional University, and Bickford Ranch. Future proposed specific plans will be incorporated into the Developing sub-region. Rural West encompasses the rural unincorporated land in western Placer County, generally west of Meadow Vista. Rural East includes rural unincorporated land from Meadow Vista to west of Donner Summit.

Projects located in Established and Developing areas would be evaluated against a threshold 15% below the unincorporated countywide average for most projects. Model data indicates that the unincorporated countywide average is projected to decrease by 11.7% for Household VMT per capita and 13.2% for Work VMT per employee. Setting the threshold at 15% will promote development in these areas close to incorporated cities to achieve shorter trip lengths, lower VMT, and reduced GHG emissions. This threshold would apply to over 85% of future residential growth and over 90% of employment growth for the unincorporated County through 2040. Use of the unincorporated average is appropriate since that is the geography over which the County has authority for land use and transportation decisions. Setting a threshold consistent with the County's planned growth is consistent with General Plan goals and policies.

Similarly, thresholds in rural areas are generally based on future growth in those sub-regions. VMT is projected to decrease by 9.8% and 2.6% for Household VMT per capita in Rural West and Rural East,

respectively. Projects in Rural West and Rural East will be evaluated against the baseline VMT of the sub-region where the project is located because trip lengths are inherently longer in rural areas and alternative modes of transportation are generally not available for most trips.

Additionally, the thresholds for non-residential development in rural areas is set to no worse than baseline, primarily to encourage new jobs in these areas. These areas are primarily residential today, so additional employment opportunities, along with local-serving goods and services would improve the overall jobs/housing balance in the area. Improving the jobs/housing balance could ultimately reduce trip lengths for many trips in the rural areas.

This threshold option recognizes that land use context affects a project's ability to achieve VMT reductions and promotes job creation in all areas of the County. Under Option 2, the most stringent thresholds are applied to areas where the majority of future growth is expected to occur. This option would also result in low VMT areas that would streamline analysis for over 70% of infill parcels in the county, more than any other threshold option staff considered. This option is a strategic approach and is unlikely to be used by other lead agencies.

Tahoe Basin

Within the jurisdiction of Tahoe Regional Planning Agency (TRPA), Article VII of the Tahoe Regional Planning Compact, "Environmental Impact Statements," establishes a measure of VMT which is required to be evaluated as part of a project's environmental analysis. Therefore, a portion of the County is subject to two overlapping environmental review standards for project development in the Tahoe Basin: TRPA environmental threshold compliance and SB 743. The County and TRPA are currently working together to create a technical foundation that will inform each agency's project evaluation process with the ultimate goal of creating a seamless, coordinated process for project applicants that addresses both SB 743 and Article VII requirements.

The travel characteristics of the Tahoe Basin are similar to areas outside the Basin, like the Resort Triangle. Additional analysis is needed to establish a threshold for these areas. As a result of this coordinated effort no thresholds are recommended for East Placer (unincorporated areas from Donner Summit to the east, including the Tahoe Basin) at this time.

STAFF RECOMMENDATION

Adopt a resolution to establish thresholds, screening criteria and associated Transportation Study Guidelines for VMT for Placer County, containing Threshold Option 1 (15% below the unincorporated County baseline)) and Screening Criteria Option 2 (Expanded Screening Criteria).

With this recommendation, the County will continue to strive to meet local, regional, and statewide goals. The County will aim to comprehensively address potential VMT impacts at a community level by evaluating strategies and mitigation measures to better connect transportation and land use. These strategies should align with the Placer County General Plan, Housing Strategy and Development Plan, Placer County Sustainability Plan, and other adopted plans to meet the needs of the community. They should also align with strategic initiatives adopted by the Board of Supervisors to create a diversity of housing, develop outcome-focused economic development strategies, and provide land use planning and environmental stewardship.

ENVIRONMENTAL IMPACT

No environmental impact is anticipated from adopting the thresholds, screening criteria and associated Transportation Study Guidelines. Adoption of a VMT threshold of significance is an administrative activity of County government that does not commit the County to approve any specific project that will result in either direct or indirect physical changes in the environment (CEQA Guidelines Section 15378(b)(5)), 15061(b)(3)). Additionally, the replacement of the LOS metric with VMT is required by the state and is therefore a ministerial action that is exempt from CEQA review (CEQA Guidelines Section 15268(a)). Therefore, the adoption of these items does not require further CEQA review.

FISCAL IMPACT

The fiscal impact of this item to the County will be negligible. However, there will likely be a cost increase for projects that are required to conduct a full VMT impact analysis and a LOS analysis. For development projects, the project applicant would pay for the additional effort. For County projects, the County would pay for the additional effort through General Fund or special funds. There may also be an additional cost to either project applicants or the County to implement mitigation measures for those projects that have a VMT impact. Finally, the County could elect to fund a fee nexus study in the future to create a VMT mitigation fee program (local or regional), a mechanism by which the County could collect fees from developers required to mitigate project impacts to pay for County multi-modal transportation programs and improvements.

ATTACHMENT

Attachment 1: Resolution adopting VMT thresholds, screening criteria, and Transportation Study Guidelines
Exhibit A: Transportation Study Guidelines, November 2020

cc:
Ken Grehm, Director, DPW
Steve Pedretti, Agency Director, CDRA
Stephanie Holloway, Senior Engineer, DPW
E.J. Ivaldi, Deputy Director, Planning Division
Crystal Jacobsen, Deputy Director, CDRA Tahoe
Leigh Chavez, Environmental Coordination Services
Shawna Purvines, Principal Planner
Clayton Cook, Deputy County Counsel
Todd Leopold, County Executive Officer

ATTACHMENT 1

Before the Board of Supervisors
County of Placer, State of California

In the matter of: A RESOLUTION CERTIFYING The establishment of thresholds, screening criteria, and associated Transportation Study Guidelines for Vehicle Miles Traveled (VMT).

Resolution No._____

The following resolution was duly passed by the Board of Supervisors of the County of Placer at a regular meeting held on _____, 2020, by the following vote:

Ayes:

Noes:

Absent:

Signed by me after its passage.

_____
Chair, Board of Supervisors

Attest:

_____
Clerk of said Board

WHEREAS, public agencies in California have historically relied on a metric known as "Level of Service" (LOS) to evaluate the transportation impacts of development projects under the California Environmental Quality Act (CEQA); and

WHEREAS, Senate Bill 743, enacted in 2013 and codified in Public Resources Code Section 21099, directed the Governor's Office of Planning and Research (OPR) to develop new CEQA Guidelines to replace LOS with metrics that 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; and

WHEREAS, in 2018, the California Natural Resources Agency certified and adopted new CEQA Guidelines Section 15064.3 that went into effect on July 1, 2020 and identifies vehicle miles traveled ("VMT"), meaning the amount and distance of automobile travel attributable to a project, as the most appropriate metric to evaluate a project's transportation impacts, and OPR provided guidance under a Technical Advisory on Evaluating Transportation Impacts in CEQA; and

WHEREAS, upon certification of the updated CEQA Guidelines, automobile delay, as measured by LOS and other similar traffic congestion metrics, will no longer constitute a significant environmental effect under CEQA; and

WHEREAS, the Guidelines for Implementation of CEQA in Title 14 of the California Code of Regulations ("CEQA Guidelines") encourage public agencies to develop and publish generally applicable "thresholds of significance" to be used in determining the significance of a project's environmental effects; and

WHEREAS, CEQA Guidelines section 15064.7(a) defines a threshold of significance as "an identifiable quantitative, qualitative or performance level of a particular environmental effect, noncompliance 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"; and

WHEREAS, the analysis leading to a recommendation considered the goals, programs, and policies of the Placer County General Plan, Housing Strategy and Development Plan, Placer County Sustainability Plan, and other adopted ordinances and plans, as well as factors unique to Placer County, including the diversity of land use contexts across the geography of Placer County, and other strategic initiatives to create a diversity of housing, develop outcome-focused economic development strategies, and provide land use planning and environmental stewardship, as described in Appendix C of the Transportation Study Guidelines; and

WHEREAS, CEQA Guidelines section 15064.7(b) requires that thresholds of significance must be adopted by ordinance, resolution, rule, or regulation, developed through a public review process, and be supported by substantial evidence; and

WHEREAS, the adoption of VMT as a threshold of significance is an organizational or administrative activity of County government that does not commit the County to approve any specific project that will result in either direct or indirect physical changes in the environment (CEQA Guidelines Section 15378(b)(5)), 15061 (b)(3)), and the replacement of the LOS metric with VMT is required by the state and is therefore a ministerial action that is exempt from CEQA review (CEQA Guidelines Section 15268(a)); and

WHEREAS, the County of Placer, following a public review process consisting of an informational session with the County Board of Supervisors on May 19, 2020; an informational session with the Planning Commission on May 28, 2020, and technical workshops on February 26, 2020 and March 16, 2020; wishes to adopt the VMT thresholds of significance for determining the significance of transportation impacts, along with screening criteria, and Transportation Study Guidelines.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF SUPERVISORS OF THE COUNTY OF PLACER:

1. The above recitals are incorporated herein as findings for establishment of thresholds, screening criteria, and approval of the Transportation Study Guidelines.

2. The Transportation Study Guidelines attached hereto as Exhibit A, are hereby adopted as thresholds of significance for analyzing local transportation impacts under CEQA.

3. The Department of Public Works may modify the Transportation Study Guidelines as necessary to reflect the latest research, data, and substantial evidence appropriate to facilitate implementation of the SB 743 requirements. However, any major policy changes that affect the basic thresholds or screening criteria approved herein shall be brought to the Board of Supervisors for review and approval prior to incorporation into the Transportation Study Guidelines.

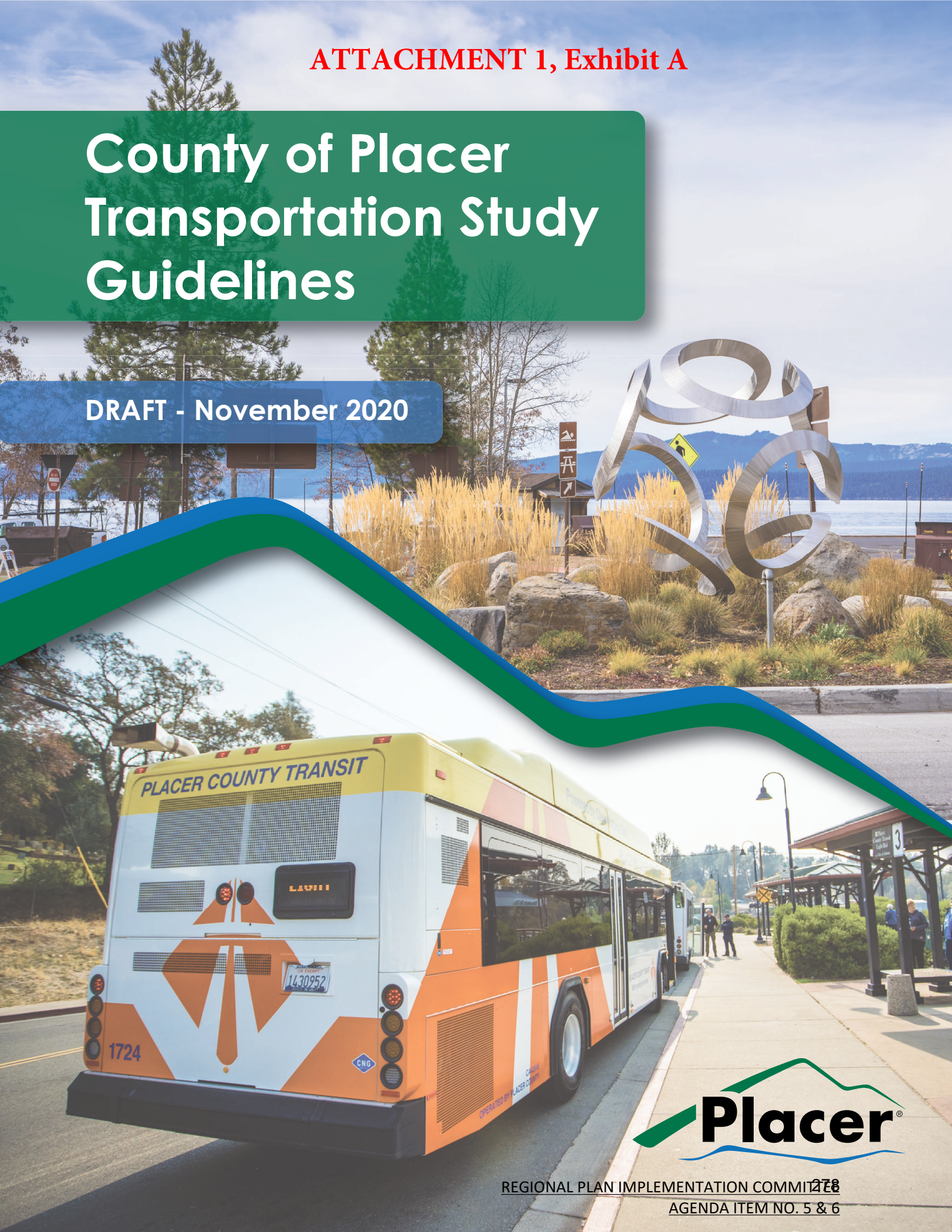
4. The Board of Supervisors finds that this resolution is exempt from the requirements of the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Sections 15378, 15061(b)(3), and 15268(a).

5. This Resolution shall become effective upon adoption by the Board of Supervisors.

ATTACHMENT 1, Exhibit A

County of Placer Transportation Study Guidelines

DRAFT - November 2020



Placer

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Appendix A – Relevant General Plan Goals and Policies

Appendix B – Placer County's SB 743 Approach for Projects under CEQA

Appendix C – VMT Thresholds & Screening Criteria Justification

Appendix D – Impact Analysis Methodology of Assessment Memorandum

Chapter 1: Introduction

These Guidelines are intended to describe the transportation analysis requirements for land development projects and major land plans (e.g., specific plans, community/area plans, etc.) in Placer County. The Guidelines acknowledge significant recent legislative changes that have occurred relative to transportation impact analysis and distinguishes between the path forward for compliance with Placer County General Plan policies versus compliance with the California Environmental Quality Act (CEQA), both of which may be required for an individual project. These Guidelines are subject to revision at any time due to future changes in analysis techniques, policies, guidelines, or statutes.

Purpose

These Guidelines are intended to provide a clear and consistent technical approach to preparing Transportation Studies in Placer County. They establish analysis techniques for Transportation Studies based on the current state-of-the-practice in transportation planning and engineering. The County expects these guidelines to result in studies that provide comprehensive, reasonable, and accurate analysis of potential transportation impacts to the environment and County facilities and services. This information is essential for decision makers and the public when evaluating individual projects.

Placer County will primarily review Transportation Studies based on the guidance presented here. However, each project is unique and the guidance in this document is not intended to be so prescriptive as to be impractical. Not all criteria and analyses described will apply to every project. Early and consistent communication with Community Development Resource Agency (CDRA) and Department of Public Works (DPW) staff is encouraged for all projects.

A Transportation Study may include two types of analysis:

1. A CEQA impact assessment that addresses compliance with the State CEQA requirements and expectations.
2. A local transportation assessment (LTA) that demonstrates project consistency with General Plan goals and policies.

Not all projects will require both a CEQA impact assessment and LTA. Some projects that do not require a CEQA impact assessment would typically only prepare an LTA, while some

minor projects may not require a Transportation Study at all (CEQA impact assessment or an LTA).

Background

California Environmental Quality Act

CEQA *refers to the California Environmental Quality Act. This statute requires analysis and identification of potentially significant environmental impacts associated with state or local action, including approval of new development or infrastructure projects. The process of identifying these impacts is typically referred to as the environmental review process.*

The California Environmental Quality Act (CEQA) "generally requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the extent feasible."[1] CEQA (California Public Resources Code, Division 13 – Environmental Quality) applies to all projects undertaken by a public agency. CEQA defines a "project" as an "activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" (Public Resource Code §21065). This includes actions necessary to be taken by public agencies for private projects, such as the issuance of a lease, permit, license, certificate, or other entitlement (Public Resource Code §21065, subdivision (c)).

CEQA Exemptions

Certain projects are exempt from CEQA review either through an act of the State Legislature (i.e., statutory exemption) or because the project is generally considered not to have potential impacts on the environment (i.e., categorical exemption). Exemptions are listed in the CEQA Guidelines, located at California Code of Regulations §15000-15387.

CEQA Impact Analysis Topics

CEQA Guidelines, Appendix G, "Environmental Checklist Form," includes sample questions that are intended to encourage thoughtful assessment of impacts for over a dozen topic areas, including transportation. The Placer County CEQA checklist largely follows the Appendix G questions with some Placer County-specific modifications. Generally, a CEQA impact assessment shall analyze a project's impact on the transportation system. This includes the project's impact on transit, roadway, bicycle, and pedestrian facilities. Chapter

[1] Governor's Office of Planning and Research. (2020). *CEQA: The California Environmental Quality Act.* Retrieved August 3, 2020 from https://opr.ca.gov/ceqa/

4 of these Guidelines present the methodology and significance criteria to consider when assessing a project's transportation impacts for CEQA purposes.

Senate Bill 743

In 2013, Senate Bill (SB) 743 started a process intended to fundamentally change transportation impact analysis as part of CEQA compliance. SB 743 required the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to establish a new transportation analysis alternative to level of service (LOS) for evaluating transportation impacts. The new transportation analysis criteria "shall promote the reduction of greenhouse gas emissions, the development of multi-modal transportation networks, and a diversity of land uses."[2] SB 743 directed OPR to recommend potential metrics to measure transportation impacts.

In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package. The CEQA Guidelines update added CEQA Guidelines Section 15064.3, which implements SB 743. CEQA Guidelines Section 15064.3 states that "generally, vehicle miles traveled (VMT) is the most appropriate measure of transportation impacts." CEQA Guidelines Section 15064.3, subdivision (c), states that the provisions of this section shall apply statewide as of July 1, 2020.

Per Public Resources Code Section 21099, subdivision (b)(2), automobile delay, as described by LOS or similar measure of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment upon certification of the CEQA Guidelines by the Natural Resources Agency, which occurred in December 2018. In combination, these

LOS *refers to "level of service," a metric that assigns a letter grade to vehicle traffic performance. The typical application of LOS is to measure the average amount of delay experienced by vehicle drivers at an intersection during the most congested time of day and to assign a report card range from LOS A (least delay) to LOS F (most delay). Under prior CEQA criteria, a certain increase in delay or LOS would result in a significant impact, which must be mitigated. However, LOS is no longer considered a significant environmental impact.*

VMT *refers to "vehicle miles traveled," a metric that accounts for the number of vehicle trips generated by a project and the length or distance of those trips. For transportation impact analysis purposes, VMT is generally expressed as VMT per capita or VMT per employee for a typical weekday. Under CEQA, VMT is now considered the most appropriate measure of transportation impacts.*

[2] Public Resources Code Section 21099(b)(1)

sections fundamentally shift required transportation impact analysis procedures under CEQA from LOS to VMT.

In addition to the CEQA Guidelines update package, OPR released a *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) in December 2018. The Technical Advisory provides advice and recommendations to CEQA lead agencies on how to implement the SB 743 changes. This includes technical recommendations regarding the assessment of VMT, thresholds of significance, and mitigation measures, which agencies may use at their discretion. The Technical Advisory states that it is "a resource for the public to use at their discretion" and that "OPR is not enforcing or attempting to enforce any part of the recommendations contained" in the advisory.

General Plan Context

The General Plan sets a vision for the future, defines the community's goals, and sets out policies and implementation actions to progress towards this vision. The Placer County General Plan consists of two documents: the *Countywide General Plan* (which consists of a policy document and land use diagram) and a set of more detailed community plans and area plans covering specific areas of the unincorporated County.

General Plan Policies

The *Countywide General Plan* provides an overall framework for development of the County and protection of its natural and cultural resources. The goals and policies contained in the *Countywide General Plan* are applicable throughout the County. Unincorporated territory not covered by an adopted community plan is subject to the specifications of the Land Use Diagram and Circulation Plan Diagram contained in the *Countywide General Plan*.

Development in Placer County is guided by the goals and policies of the General Plan. These guidelines are developed consistent with the General Plan. Transportation Studies must address General Plan requirements to demonstrate that projects are consistent with the plan. An inconsistency with the General Plan is ground for rejecting a project or requiring an amendment to the plan. Appendix A contains a selection of relevant transportation goals and policies.

Community/Area Plan Policies

Community and Area Plans provide a more detailed focus on specific geographic areas within the unincorporated County. A Community or Area Plan is a policy-level document that establishes anticipated land uses; however, it is usually a generalized plan. The goals

and policies contained in the Community and Area Plans supplement and elaborate upon, but do not supersede, the goals and policies of the Countywide General Plan. Unincorporated territory covered by a Community/Area Plan is subject to the specifications of the land use and circulation plan diagram contained in the applicable community plan. Transportation Studies must address Community/Area Plan requirements, where applicable.

Placer County has 15 Community/Area Plans with individual policy documents. The following documents can be found on the County's CDRA website:

- Alpine Meadows General Plan
- Colfax General Plan
- Foresthill Divide Community Plan
- Horseshoe Bar/Penryn Community Plan
- Meadow Vista Community Plan
- Sheridan Community Plan
- Sunset Area Plan
- Weimar/Applegate/Clipper Gap General Plan
- Auburn/Bowman Community Plan
- Dry Creek/West Placer Community Plan
- Granite Bay Community Plan
- Martis Valley Community Plan
- Ophir General Plan
- Squaw Valley General Plan
- Tahoe Basin Area Plan

Specific Plans

A Specific Plan is a comprehensive planning and zoning document for a defined geographic region of the County. A Specific Plan includes detailed analysis supported by robust data (e.g. number of units, anticipated trips, acres of impact, etc.). It implements the General Plan by providing a special set of development standards applied to a particular geographic area. The following adopted Specific Plan documents can be found on the County's Community Development website:

- Bickford Ranch Specific Plan
- Placer Vineyards Specific Plan
- Riolo Vineyards Specific Plan
- Placer Ranch Specific Plan
- Regional University Specific Plan
- Village at Squaw Valley Specific Plan

The County has also adopted many transportation planning documents. These documents define the vision for Placer County's transportation network, in compliance with the applicable planning documents listed above. Local transportation planning documents include:

- Placer County Capital Improvement Program (CIP)
- Placer County Short Range Transit Plan
- Tahoe Truckee Area Regional Transit (TART) Systems Plan
- Placer County Regional Bikeway Plan
- Resort Triangle Transportation Plan

Regional transportation planning documents include the *Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS)* (Sacramento Area Council of Government, 2019) and Regional Transportation Plans by Placer County Transportation Planning Agency (PCTPA) and Tahoe Regional Planning Agency (TRPA). Additionally, the Airport Land Use Compatibility Plan could affect projects near local airports. For projects near the State Highway System, the transportation analyst should consult with Caltrans for the applicable planning documents.

Is the Project Exempt from CEQA?

Certain projects are exempt from CEQA review either through an act of the State Legislature (i.e., statutory exemption) or because the project is generally considered not to have potential impacts on the environment (i.e., categorical exemption). CEQA exemptions are listed in the CEQA Guidelines Section15260-15333). Project applicants should review potential statutory and categorial exemptions and coordinate with County CDRA staff to determine if any of these exemptions apply to the proposed project. If a project is exempt from CEQA but meets one or more of the triggers for a Transportation Study, the study would only include LTA components.

Types of Projects that Require a Transportation Study

County CDRA and DPW staff will determine the need for a Transportation Study in conformance with CEQA and County policies. The following types of projects, which involve

development in and around Placer County and affect the County's transportation system, may require a Transportation Study:

- Transportation infrastructure modification or expansion, including capital improvement projects (CIP) on County roads and state highways.
- Land use entitlements requiring discretionary approval by Placer County, which include General Plan amendments, Community/Area Plans and any amendments, Specific Plans and any amendments, zoning changes, conditional use permits, minor use permits, parcel maps, variances, design review permits, tentative maps, etc.
- Land use activity advanced by agencies other than Placer County that is subject to the County's review under state and federal law.
- Land use activity advanced by agencies other than Placer County that is inconsistent with the County's General Plan.

If the project falls into one of the categories listed above, the project parameters below will inform whether a Transportation Study is required.

Does the project require a Transportation Study?

Unless waived by the County, a Transportation Study is required when a project requires a permit application which is subject to discretionary approval and any one of the following conditions is met:

- The project has the potential to create a significant environmental impact under CEQA, as determined by County staff.
- The project will substantially alter physical or operational conditions on a County roadway, bikeway, sidewalk, or other transportation facility.
- The project may affect roadway safety.
- The project generates a significant percentage of heavy vehicle trips.
- The project has the potential to generate 110 or more new passenger vehicle trips per day.

If a Transportation Study is required, either by CEQA or County policies, the scope of the Transportation Study will depend on the location and size of the proposed project, the prevailing conditions in the surrounding area, and the technical questions being asked by decision makers and the public. County staff may determine additional triggers for study requirements due to location, project complexity, local transportation system complexity, and other factors.

If a project is consistent with the applicable planning documents and generates less than 200 new passenger vehicle trips per day, the Transportation Study scope can be substantially reduced in consultation with County DPW staff.

Chapter 2: Process Overview

This section provides an overview of the process to develop and review a Transportation Study.

Who is Involved?

The project applicant will be responsible for funding the Transportation Study and selecting the consultant. Transportation Studies must be prepared under the supervision of a qualified professional who has specific training and experience in preparing transportation analysis. Transportation analysts may include licensed traffic engineers, licensed civil engineers, or transportation planners. The qualified professional must possess the ability to forecast, interpret transportation data, and evaluate transportation needs for the development and roadway system.

Transportation Studies will be reviewed by Placer County CDRA and DPW staff. If a project will affect facilities controlled by another jurisdiction, such as Caltrans, incorporated cities, other counties, Union Pacific Railroad, etc., coordination with that jurisdiction may be required. Placer County staff can provide guidance and contact information for other jurisdictions.

Although transportation analysts and reviewers will sometimes have different perspectives, all parties involved in the process should adhere to established engineering ethics and conduct all analysis and reviews objectively and professionally.

Summary of Process

The following summarizes the typical process for completing a Transportation Study in Placer County. During this process, the project applicant and/or their qualified professional may request a meeting or conference call with County staff to clarify study

requirements or comments received on the draft study. It is critical that the transportation analyst coordinate with County staff continuously throughout the planning process to ensure that the County's requirements are met.

Step 1: Pre-Development Meeting

The first step in processing a new development application in the unincorporated areas of Placer County is requesting a Pre-Development Meeting through Environmental Coordination Services (ECS), a department of the Community Development Resource Agency (CDRA). A Pre-Development Meeting is mandatory for all projects requiring a Conditional Use Permit, Subdivision (over four lots), General Plan Amendment, Rezone, or Specific Plan and optional for any other project type where an applicant would like structured staff assistance with the application and permitting process. Applicants must fill out the Pre-Development Meeting Request Form (available on the County's website) and submit it along with a detailed project description, conceptual site plan, and the required fee to ECS. At the Pre-Development Meeting, County staff will provide the applicant with detailed checklists from all relevant divisions and departments which specify the technical information and special studies, including requirements for a Transportation Study, necessary to submit a formal application

County staff may request additional information from the project applicant regarding the transportation characteristics of the proposed project to determine the type and extent of analysis that is needed. If the proposed project is modified in any way, the scope of work and study area may require modification at the County's discretion.

Step 2: Confirm Study Requirements

The transportation analyst will coordinate with County DPW and CDRA staff on the requirements of the Transportation Study. The transportation analyst will review the preliminary project parameters in Chapter 1 of these Guidelines and determine the extent of analysis that is required. County staff shall be consulted to confirm the extent of the study area and overall scope of the study.

The proposed scope of the study will be submitted to Placer County staff for review and comment. The County will either provide an email confirming the scope of the study or identify revisions to the proposed scope of the study. The transportation analyst may request a meeting or conference call to clarify the scoping comments and establish requirements.

Step 3: Prepare Study & Submit Draft

The transportation analyst will prepare a Draft Transportation Study consistent with the requirements established in Steps 1 and 2 and the procedures outlined in these Guidelines. The Draft Transportation Study will be submitted to Placer County for review. The County will provide written comments on the draft study.

Step 4: Finalize Study

The transportation analyst will address all County comments and produce a Final Transportation Study. A record identifying how each comment was addressed shall also accompany the Final Transportation Study. County staff will review the Final Transportation Study and provide written comments again, if needed. Steps 3 & 4 will iterate, until the County's comments are addressed and resolved sufficiently. The project applicant's consultant and/or County staff will prepare the environmental document and conditions of approval incorporating the findings of the Final Transportation Study.

Chapter 3: Scope of the Study

If a Transportation Study is required, either by CEQA or County policies, the scope of the Transportation Study will depend on the location and size of the proposed project, the prevailing conditions in the surrounding area, and the technical questions being asked by decision makers and the public.

Major Components of the Study

The extent and complexity of a Transportation Study can vary greatly. Most Transportation Studies will include a CEQA Impact Assessment and a Local Transportation Assessment, as illustrated in Figure 1. The CEQA Impact Assessment is intended to cover most, but not all, topics on Placer County's CEQA checklist for transportation. The Local Transportation Assessment is intended to cover topics of importance that are not addressed under CEQA.

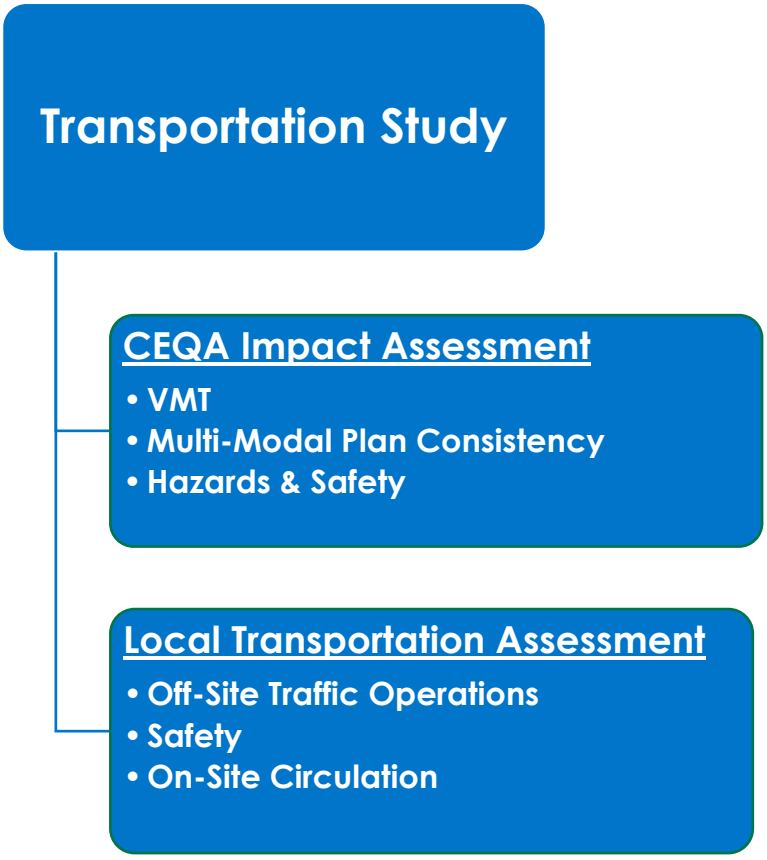


Figure 1: Major Components of a Transportation Study

Study Area

Defining a geographic study area needs to be done through a process that results in substantial evidence that supports the study area delineation. The boundary should extend as far as any potential transportation impact might occur, including across jurisdictional boundaries. The study area should be viewed as the "area of influence" of a specific project. Careful consideration of all modes and facilities (i.e., transit, pedestrian, bicycle, vehicle, rail crossings, etc.) is required when selecting the study area. The extent of the study area for the Transportation Study should be determined based on consultation with County DPW staff (see Step 2 in the Process Overview) and the following guidance:

- If the project is of statewide, area-wide, or of regional significance as defined in Section 15206 of the CEQA Guidelines, then the study area shall consider highways and rail facilities within 10 miles of the project site.
- For potential impacts to VMT, the analysis tools used should be capable of estimating VMT using the full length of trips, without truncating at jurisdictional or other boundaries.
- For potential impacts to pedestrian facilities, the study area should include pedestrian facilities within a minimum of ½-mile of the project site.
- For potential impacts to bicycle facilities, the study area should include bicycle facilities within a minimum of two miles of the project site.

Additional facilities may be studied based on circumstances unique to the project or site. Applicants should consult with the County early regarding any additional study locations based on local or site-specific issues, especially those related to pedestrians, bicycles, and transit.

Analysis Scenarios

The Transportation Study may include the transportation analysis scenarios listed below.

Baseline (Existing) Conditions

- **Baseline Conditions** represented by transportation conditions for all travel modes in the study area based on recent field observations. Traffic volumes for roadway analysis should be based on recent count data. The baseline for CEQA Impact Assessment shall be identified consistent with CEQA Guidelines Section 15125(a).

- **Baseline Plus Project Conditions** represented by project changes to baseline transportation conditions for all travel modes in the study area. Traffic volume forecasts for roadway analysis should reflect baseline conditions plus traffic generated by the proposed project. For re-use or conversion projects, this will involve accounting for any existing use of the site that remains or will be discontinued.

Near-Term Conditions

- **Near-Term Conditions** represented by changes to baseline transportation conditions for all travel modes in the study area resulting from approved, but not yet constructed, projects. Near-Term analysis is not required by CEQA. However, it may be requested by the County when multiple projects are proposed in the same geographic area. Traffic volume forecasts for roadway analysis should reflect existing conditions plus growth due to approved development. This scenario may be skipped if the study area has limited approved developments that haven't been constructed, as determined by County staff.

- **Near-Term Plus Project Conditions** represented by changes to the Near-Term conditions caused by the proposed project. This scenario may be skipped if the Near-Term scenario is not required.

Cumulative (Future) Conditions

- **Cumulative No Project Conditions** represented by transportation conditions for all travel modes in the study area and planned land use development to accommodate population and employment growth anticipated by the cumulative horizon year. In most cases, the project site will likely be vacant under this scenario. In some cases though, this scenario may need to account for any existing uses on the site that could continue and potential increases in development allowed by ministerial approvals only. This scenario may be skipped if the project is consistent with the County General Plan and/or Community/Area Plan, as determined by County staff

- **Cumulative Plus Project Conditions** represented by cumulative conditions, as defined above, plus changes to these conditions caused by the proposed project. This scenario needs to account for whether the project is changing any existing or planned land uses on the site. This scenario may be skipped if the project is consistent with the County General Plan and/or Community/Area Plan; or if the project's cumulative traffic growth was already analyzed in a previous Transportation Study.

Most isolated or small projects consistent with the General Plan or other applicable planning document will be required to complete only the Baseline Conditions analysis. Larger

projects and projects near other proposed development projects may be required to analyze both Baseline and Near-Term Conditions. Cumulative conditions analysis is typically required for projects that are proposing rezoning or General Plan, Community/Area Plan, or Specific Plan changes.

Additional analysis scenarios may be required in the traffic impact analysis dependent on project conditions and setting. For example, other scenarios may be needed to test phasing or other interim conditions, at the discretion of the County.

In some instances, a larger development will be built in phases. If the Transportation Study fully addresses development phasing and a subsequent phase or project is consistent (land use, transportation network, etc.) with the larger development plan, subsequent phases will generally not require supplemental Transportation Studies.

Analysis Time Periods

The determination of analysis time periods will depend on the travel modes and type of project being evaluated. For non-auto travel modes, the analysis may include daily, peak period, or peak hour conditions. For roadway analysis, the analysis time period should be informed by County General Plan and/or Community/Area Plan policies or other standards. For example, some Community/Area Plans have specified peak hour vehicle LOS standards. These may include weekday a.m., midday, and p.m. peak hours as well as Saturday midday or p.m. peak hours. Final determination shall be made in consultation with County staff.

Based on the land use of the proposed project and upon consultation with County, most studies should analyze transportation conditions during the peak hour of the following typical commute time periods:

- Typical Weekday (24 hours)
- Weekday morning peak (7:00 – 9:00 a.m.)
- Weekday evening peak (4:00 – 6:00 p.m.)

For some projects, the County may substitute or require additional peak hour analysis for the following time periods:

- Typical Weekend Day (24 hours)
- Weekday afternoon peak (2:00 – 4:00 p.m.), e.g., near schools

- Friday evening peak (5:00 – 7:00 p.m.), e.g., areas of high weekend destination travel such as the Tahoe Region
- Weekend midday peak (11:00 a.m. – 1:00 p.m.), e.g., areas of high weekend destination travel such as the Tahoe Region, a retail-heavy commercial corridor, etc.
- Weekend evening peak (4:00 – 7:30 p.m.), e.g., areas of high weekend destination travel such as the Tahoe Region

In addition to time periods, the County may identify an appropriate season for analysis. For example, a project associated with winter alpine sports in the Tahoe area may require data reflecting peak winter recreational activity. Projects in the eastern portion of the County, especially those located in the Tahoe Basin will likely have unique analysis periods related to peak seasons and compliance with the TRPA analysis expectations.

The determination of study time periods for the Transportation Study should be made separately for each proposed project based upon the peaking characteristics of project-generated traffic, location, and peaking characteristics of the adjacent street system and land uses. The time period(s) that should be analyzed will depend on whether the study is being used to size transportation infrastructure of identify potential environmental impacts. Final determinations should be confirmed with Placer County DPW staff.

Project analysis time periods are intended to capture frequently reoccurring transportation conditions. Transportation analysis is not intended to capture special events or holiday conditions, unless those conditions affect how the transportation system is designed, operated, or maintained.

Consultation with Other Jurisdictions

If the study area overlaps with other jurisdictions, the transportation analyst must consult with other jurisdictions to verify study locations and to specify the criteria that should be used in the Transportation Study for these locations. County staff can facilitate consultations, if desired. Section 15086 of the CEQA Guidelines shall be followed as the basis for satisfying consultation requirements.

Chapter 4: CEQA Impact Assessment

As stated previously, a Transportation Study may include two components: CEQA Impact Assessment and the Local Transportation Assessment. This section describes the major components of the CEQA Impact Assessment, including VMT assessment, consistency with applicable planning documents, and hazards assessment. This section is not intended to cover all aspects of Placer County's CEQA Checklist for transportation. Topics such as emergency access are assessed elsewhere under CDRA's review process.

CEQA Impact Assessment Criteria

Per the Placer County CEQA checklist, a project may have a significant transportation impact on the environment if it would:

a. Conflict with a program, plan, ordinance, or policy, (except Level of Service) addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities

b. Substantially increase hazards to vehicle safety due to geometric design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

c. Result in inadequate emergency access or access to nearby uses

d. Result in Vehicle Miles Traveled (VMT) which exceeds an applicable threshold of significance, except as provided in CEQA Guidelines Section 15064.3 subdivision (b)

The significance criteria set forth in these guidelines have been developed consistent with the Placer County modified Appendix G checklist questions to evaluate potential project impacts, including temporary impacts associated with construction activities. Table 1 lists the criteria to be applied in assessing transportation-related CEQA impacts; that is, the project would result in significant CEQA impacts if it would trigger any of the listed criteria.

Table 1: CEQA Significance Criteria		
Analysis	**Component**	**Significance Criteria**
VMT Impacts	Roadway	• The project would result in a VMT-related impact per the applicable threshold of significance presented in Table 2 of these Guidelines and VMT impact analysis results.
Multi-Modal Plan Consistency	Transit Service and Facilities	• The project physically disrupts an existing transit service or facility or interferes with implementation of a planned transit service or facility. • The project results in increased travel time for buses that adversely affect on-time performance. • The project results in increased transit ridership demand that results in passenger loads that exceed vehicle loading standards. • The project results in increased potential for safety conflicts involving transit vehicles and other modes of travel.
	Bicycle Facilities	• The project physically disrupts an existing bicycle facility or interferes with implementation of a planned bicycle facility. • The project results in a significant increase in bicyclists on a facility that does not have adequate bicycle facilities, such that conflicts between bicyclists and other travel modes are likely to increase.
	Pedestrian Facilities	• The project fails to provide accessible and safe pedestrian connections between buildings and to adjacent streets and transit facilities. • The project physically disrupts an existing pedestrian facility or interferes with implementation of a planned pedestrian facility. • The project results in an increased presence of vehicles and/or pedestrians on a facility that does not have adequate pedestrian facilities, such that conflicts between pedestrians and other travel modes are likely to increase.
	General Plan Consistency	• The project conflicts or creates inconsistencies with General Plan policies, except an LOS policy.

Table 1: CEQA Significance Criteria		
Analysis	**Component**	**Significance Criteria**
Hazard & Safety Impact	Roadway Design and Users	• The project would create a condition that does not meet current design standards. • The project would substantially increase hazards to vehicle safety due to geometric design features (e.g., sharp curves or dangerous intersections) • The project introduces incompatible users (e.g., farm equipment) to a roadway or transportation facility not intended for those users.
	State Highway Facilities	• The project results in queuing at off-ramps resulting in slow or stopped traffic past the off-ramp gore point. • Project is determined to negatively affect safety of the State highway facilities.

VMT Assessment

Per CEQA Guidelines Section 15064.3, subdivision (a), vehicle miles traveled (VMT) is the most appropriate metric for evaluating transportation impacts. This section describes the VMT metrics, methodology, and significance criteria for evaluating VMT impacts for projects in Placer County.

VMT refers to the amount and distance of vehicle travel attributable to a project. VMT generally represents the number of vehicle trips generated by a project multiplied by the average trip length for those trips. For CEQA transportation impact assessment, VMT shall be calculated using the origin-destination VMT method, which accounts for the full distance of vehicle trips with one end from the project.

VMT does not directly measure traffic operations but instead is a measure of network use or efficiency, especially if expressed as a function of population or employment (i.e., VMT per capita). VMT tends to increase as land use density decreases and travel becomes more reliant on the use of automobiles due to the long distances between origins and destinations. VMT can also serve as a proxy for impacts related to energy use (fuel consumption), air pollution emissions, greenhouse gas (GHG) emissions, safety, and roadway maintenance. The traditional use of VMT in environmental impact analysis is to estimate mobile air pollution emissions, GHG emissions, and energy consumption.

These Guidelines present direction for assessing VMT impacts for land development projects within Placer County in compliance with CEQA Guidelines Section 15064.3. This section addresses several aspects of VMT impact analysis, and is organized as follows:

- **Screening Criteria:** Screening criteria are intended to quickly identify when a project should be expected to cause a less-than-significant VMT impact without conducting a detailed study (see CEQA Guidelines §15063, subdivision (c)(3)(C); 15128; and Appendix G).

- **Significance Thresholds:** Significance thresholds define what constitutes an acceptable level of VMT and what is considered a significant level of VMT requiring mitigation. Selection of metrics and thresholds are governed in Section 21099(b)(1) of CEQA and in CEQA Guidelines Section 15064.7.

- **Analysis Methodology:** These are the procedures and tools for producing VMT forecasts to use in the VMT impact assessment.

- **Mitigation:** Projects that are found to have a significant VMT impact based on the County's significance thresholds are required to implement mitigation measures to reduce impacts to a less than significant level (or to the extent feasible). The Guidelines contain a suite of potential mitigation measures to reduce VMT.

Project Categories

Placer County has a considerable amount of land currently planned for development but not yet in the construction phase. Potential projects can be categorized as follows:

- Category 1: Projects within a previously approved Specific Plan

- Category 2: Projects within a previously approved Community/Area Plan

- Category 3: All other projects

Appendix B contains ECS's draft guidance to project applicants for what VMT analysis may be required for projects in each of these situations.

Projects that are wholly consistent with their land use entitlements will require no further CEQA analysis. Similarly, projects that are consistent with a previously approved Community/Area Plan that included a VMT analysis in their environmental review would require no further VMT analysis. There are currently two plans that included a VMT analysis: the Sunset Area Plan and the Tahoe Basin Area Plan.

However, projects that result in substantial changes to an approved Specific Plan, are in a Community/Area Plan that did not include a VMT analysis, or are inconsistent with or outside of a previously approved Community/Area Plan will be required to analyze potential VMT impacts. For Specific Plan amendments, if additional VMT analysis is warranted, the modified project proposal will be evaluated against the anticipated VMT allocated with the Specific Plan Area land use entitlements for the project site or against the County's adopted VMT thresholds, as determined by County staff.

Screening Criteria

Screening criteria can be used to quickly identify whether sufficient evidence exists to presume a project will have a less than significant VMT impact without conducting a detailed study (see CEQA Guidelines §15063, subdivision (c)(3)(C); 15128; and Appendix G). However, each project should be evaluated against the evidence supporting that screening criteria to determine if it applies. Projects meeting at least one of the criterial below can be presumed to have a less than significant VMT impact, absent substantial evidence that the project will lead to a significant impact.

The Transportation Study shall prepare a VMT analysis or assessment for all land development projects, except for those that meet at least one of the following criteria outlined below. A project that meets at least one of the screening criteria below can be presumed to have a less than significant VMT impact due to project characteristics and/or location and complete VMT analysis would not be required. Placer County DPW staff should be consulted to verify that the less than significant VMT impact presumption is appropriate.

The following screening criteria are applicable for projects in unincorporated Placer County. Refer to Appendix C for screening criteria justification. These screening criteria are subject to revision due to future changes in technical data, policies, guidelines, or statutes.

- **Small Projects:** Defined as a project that generates 110 or fewer average daily vehicle trips or less than 880 VMT on a typical day. The types of projects that generate under 880 daily VMT, based on data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[3] and Placer County trip length data include the following:
    - 17 or fewer single family dwelling units
    - 22 or fewer multi-family dwelling units
    - 10,000 square feet or less of office uses
    - 22,200 square feet or less of light industrial uses
    - 63,200 square feet or less of warehouse uses

- **Affordable Housing:** Defined as a project consisting of deed-restricted affordable housing in unincorporated Placer County or Below Market Rate housing in the East Placer Region (excluding the Tahoe Basin). Below Market Rate housing refers to properties that are leased or sold at prices that are below the current market rate, as determined by CDRA staff. This includes deed-restricted housing and housing that is affordable by design such as multi-family housing. Such units may, or may not, feature deed-restrictions that limit occupancy to income qualifying households (i.e., income-restricted).

- **Local-Serving Non-Residential Development:** Defined as projects consisting of local-serving non-residential uses, unless substantial evidence indicates the project would generate a potentially significant level of VMT. Local serving uses are generally less than 50,000 square feet; however, substantial evidence may be used to establish whether a project over that size is local serving. Examples of local-serving uses include:
    - General retail
    - Grocery store
    - Restaurant or bar
    - Laundry or dry cleaners
    - Personal services (barber or salon)
    - Bank or financial services
    - Medical or dental services
    - Gym, health club, fitness studio
    - Public schools or community college
    - Childcare center

[3] *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2017

- House of worship
- Library
- Civic center or community center
- Police or fire station
- Government support facility
- Community park
- Post office
- Utility facilities (water, sewer, communication, etc.)

- **Projects in Low VMT-Generating Area:** Defined as a residential or office project that is in a VMT efficient area based the Placer VMT Estimation Tool (discussed below). The project must be consistent in size and land use type (i.e., density, mix of uses, transit accessibility, etc.) as the surrounding built environment.

Subject to DPW staff confirmation, a project may be presumed to have a less than significant VMT impact if it meets one or more of the above screening criteria unless other substantial evidence exists that would indicate the project would generate a potentially significant level of VMT.

Significance Thresholds

Projects that do not have a less than significant VMT impact presumption based upon the criteria set forth above must include a detailed analysis of the project's VMT impact in their Transportation Study. The significance thresholds for Western Placer County and recommended VMT metric used to measure VMT are described by land use type in Table 2. Projects that exceed these thresholds would have a significant VMT impact. Refer to Appendix C for threshold justification and a definition of each VMT metric.

Within the jurisdiction of Tahoe Regional Planning Agency (TRPA), Article VII of the Tahoe Regional Planning Compact, "Environmental Impact Statements," establishes a measure of VMT which is required to be evaluated as part of a project's environmental analysis. Therefore, a portion of the County is subject to two overlapping environmental review standards for project development in the Tahoe Basin: TRPA environmental threshold compliance and Placer's CEQA threshold compliance. The County and TRPA are currently working together to create a technical foundation that will inform each agency's project evaluation process with the ultimate goal of creating a seamless, coordinated process for project applicants that addresses both SB 743 and Article VII requirements.

The travel characteristics of the Tahoe Basin are similar to areas outside the Basin, like the Resort Triangle. Additional analysis is needed to establish a threshold for these areas. As a result of this coordinated effort no thresholds are recommended for East Placer

(unincorporated areas from Donner Summit to the east, including the Tahoe Basin) at this time.

Table 1: VMT Thresholds of Significance by Project Type for Western Placer County

Land Use/ Project Type	Recommended Metric[1]	Threshold for Determination of a Significant Transportation VMT Impact[2]
Residential	Household or Home-based VMT per capita	15% below unincorporated County baseline
Commercial Retail	Total VMT	Zero net increase
Office Employment	Work VMT per employee	15% below unincorporated County baseline
Industrial/ Agricultural Employment	Work VMT per employee	
Hotel/ Campground	VMT per room or per site	

Notes:

1. Recommended metric is specified, but other metrics can be utilized, at the discretion of DPW.
2. Projects that exceed these thresholds would have a significant VMT impact. Refer to Appendix C for threshold justification and definition of recommended metrics. The threshold value should be established using same methodology used for analysis of the project. The unincorporated county baseline may exclude the Tahoe Basin or other areas, due to modeling limitations.
3. Recreational projects may be evaluated based on net change in VMT or an efficiency metric depending on the characteristics of the proposed project, as determined by DPW.

These thresholds are subject to revision due to future changes in policies, guidelines, or statutes. Thresholds for East Placer are forthcoming. Cumulative analysis may be required for projects that use absolute analysis metrics (i.e. Total VMT or net change in VMT). Projects that use efficiency metrics, such as VMT/capita or VMT/employee may not be required to analyze cumulative VMT impacts. As stated in the OPR Technical Advisory, "A project that falls below an efficiency-based threshold that is aligned with long-term goals and relevant plans has no cumulative impact distinct from the project impact." In some cases, the cumulative VMT effects of a project may be less than the existing VMT, due to improved land use mix in the study area. In such cases, cumulative VMT may be addressed qualitatively with substantial evidence.

Analysis Methodology

If VMT analysis is required, a variety of analysis methodologies are available for use, including the Placer VMT Estimation Tool, various travel demand models, and/or qualitative assessments. The transportation analyst shall consult with Public Works staff to determine which methodology is most appropriate given the location and characteristics of the proposed project.

Placer VMT Estimation Tool

Placer County has developed the Placer VMT Estimation Tool for use on local land development projects. The Tool is an interactive web-based map that estimates a project's VMT metrics based on the VMT performance of adjacent existing development. The Tool is based on data from the regional travel demand model. The Placer VMT Estimation Tool may be used to assist in determining whether a project qualifies for screening (i.e. if the project is in a low-VMT generating area) and/or to assess a proposed project's VMT impact.

In order to use the Placer VMT Estimation Tool, the project must be generally consistent in size and land use type (i.e., density, mix of uses, transit accessibility, etc.) with the surrounding built environment. Placer County CDRA and/or DPW staff must verify that the project meets this condition for a project applicant to utilize the Placer VMT Estimation Tool. Projects that meet this condition are not required to use the Placer VMT Estimation Tool and may elect to input the project into a valid local or regional travel forecasting model.

The Tool and additional documentation can be accessed from the County's website: <Insert link here when VMT Tool is available>

Travel Forecasting Models

Projects that do not qualify for screening or the Placer VMT Estimation Tool must use a valid local or regional travel forecasting model to prepare VMT estimates. Travel forecasting model options include but are not limited to the SACOG SACSIM 19 activity-based travel forecasting model, the Tahoe Activity-Based (AB) model, Town of Truckee travel forecasting model, SACMET travel forecasting model, and SPRTA travel forecasting model.

When applying a travel forecasting model, the transportation analyst shall review the travel demand model to ensure provides accurate and meaningful results. Based on national guidance contained in the *NCHRP Report 765, Analytical Travel Forecasting Approaches for Project-Level Planning and Design* (Transportation Research Board, 2014), the travel forecasting model should meets the following expectations:

- A travel forecasting model should be sensitive to those policies and project alternatives that the model is expected to help evaluate.
- A travel forecasting model should be capable of satisfying validation standards that are appropriate to the application.
- Project-level travel forecasts, to the extent that they follow a conventional travel model, should be validated following the guidelines of the Travel Model Validation

and Reasonableness Checking Manual, Second Edition from FHWA. Similar guidelines are provided in NCHRP Report 716.

- The model should be subject to frequent recalibrations to ensure that validation standards are continuously met.

The transportation analyst shall review the travel demand model to ensure that the travel forecasting model meets the following criteria to be deemed acceptable for use in VMT impact assessment:

- Completed calibration and validation within the past 5 years – recent calibration and validation is essential for ensuring the model accurately captures evolving changes in travel behavior. Per NCHRP Report 765, "The model should be subject to frequent recalibrations to ensure that validation standards are continuously met."

- Demonstrated sensitivity to VMT effects across demographic, land use, and multimodal network changes – validation reporting will be checked for static and dynamic tests per the *2017 Regional Transportation Plan Guidelines for Metropolitan Transportation Planning Organizations* (CTC, 2017) and *Travel Model Validation and Reasonableness Checking Manual, Second Edition*, (TMIP, FHWA, 2010). The model's validation in the study area should be verified for each forecast time period (i.e., daily, a.m. peak hour, p.m. peak hour, etc.) and for each mode analyzed. The model trip length information and VMT estimates should also be compared to available data to verify accuracy.

- Capable of producing both "project-generated VMT" and "project effect on VMT" estimates for the project – both metrics may be required for complete VMT analysis. Project-generated VMT is useful for understanding the VMT associated with the trips traveling to/from a project site. The 'project's effect on VMT' is more essential for understanding the full influence of the project since it can alter the VMT generation of neighboring land uses.

- Capable of producing regional, jurisdictional, and project-scale VMT estimates – VMT analysis for air quality, greenhouse gases, energy, and transportation impacts requires comparisons to thresholds at varying scales.

- Capable of accounting for full trip lengths for VMT calculations – The OPR *Technical Advisory* states that lead agencies should not truncate any VMT analysis because of jurisdictional or model boundaries. The intent of this recommendation is to ensure that VMT forecasts provide a full accounting of project effects.

- Reasonable land use or socioeconomic forecasts – Models are used to forecast travel demand for a specific horizon year (e.g., 20 years). The land use and

socioeconomic forecasts need to match the horizon year and be based on reasonable market conditions that reflect past and future development trends for the specific study area. Additionally, the model needs to include any reasonably foreseeable development projects.

Whichever model is selected should be used to: (1) establish the baseline VMT without the project, (2) establish the applicable VMT impact significance threshold value, and (3) analyze the project. The travel forecasting model should be run both without and with the project, and model outputs should be processed for comparison according to the thresholds presented in Table 2. For project types where the project-generated VMT is compared to the baseline average, the analysis shall apply the same method to process model outputs to obtain the appropriate VMT per capita metric. For project types where the threshold is based on total regional VMT, the total VMT for the regional shall be produced using the same process both under "without project" and "with project" conditions. This will ensure an apples-to-apples comparison of the baseline VMT condition and the project's VMT estimates when conducting the VMT impact assessment and applying the appropriate VMT threshold, consistent with guidance presented in the Technical Advisory.

The resulting VMT values shall be compared to the appropriate threshold in Table 2 to determine whether the project results in a significant CEQA transportation impact due to VMT.

Other Methodologies

As VMT analysis techniques continue to evolve, other methods, data sources, and approaches may be acceptable to conduct VMT analyses for CEQA documents. For example, VMT estimates developed using travel data from surveys, mobile devices, and credit card transactions may be appropriate in certain circumstances. Also, qualitative assessments supported by economic studies, demographic data, or other forms of substantial evidence may be acceptable.

A qualitative assessment of VMT is a compilation of substantial evidence that describes why the project would or would not have a significant impact on VMT. Qualitative assessments may be used for projects that have unique characteristics that cannot be accurately analyzed in the Placer VMT Estimation Tool or travel demand models. Qualitative assessments can include economic or market analysis, socioeconomic or demographic data, or other substantial evidence to support the significance finding.

Whichever methodology is selected, it is important that the same method, data source, or approach is used for all aspects of the VMT analysis to establish an "apples-to-apples" comparison between thresholds, project VMT estimates, and VMT reduction estimates, consistent with guidance presented in the OPR Technical Advisory.

Mitigation

If a project would result in VMT levels that exceed the thresholds identified in Table 2, the project would have a significant transportation VMT impact. The significant VMT impact must be mitigated by reducing the project's VMT to the extent feasible. Typically, VMT is reduced by implementing strategies that achieve one of the following:

- Reducing the number of automobile trips generated by the project or by the residents or employees of the project.
- Reducing the distance that people drive.

Site-specific strategies that reduce single occupant automobile trips or reduce travel distances are called transportation demand management (TDM) strategies. Placer County will require TDM strategies for projects that meet the triggers outlined in the County's Trip Reduction Ordinance (TRO) or require mitigation for VMT impacts.

There are several resources for determining the reduction in VMT due to TDM measures such as California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010). The project applicant should coordinate with the County CDRA and/or DPW staff to determine appropriate VMT reduction strategies and methods for calculating their effectiveness. Table 3 below contains a list of potential mitigation strategies that can be considered. The substantial evidence and effectiveness of each mitigation measure is dependent on the land use context and other factors that should be considered prior to selecting mitigation measures.

Table 3: Examples of Potential VMT Mitigation Measures

Category	Measure
Project Changes	• Locate the project in an area of the region that already exhibits low VMT. • Locate the project near transit. • Increase project density. • Increase the mix of uses within the project or within the project's surroundings. • Increase connectivity and/or intersection density on the project site. • Increase access to common goods and services, such as groceries, schools, and daycare. • Incorporate affordable housing into the project.
Parking	• Limit parking supply • Unbundle parking costs • Provide parking cash-out programs • Price workplace parking
Transit	• Improve or increase access to transit • Reduce transit headways • Implement neighborhood shuttle • Provide partially or fully subsidized transit passes • Provide incentives or subsidies that increase the use of modes other than a single-occupancy vehicle
Commute Trip Reductions	• Implement a commute reduction program • Provide telework options • Provide on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, showers and locker rooms, and bicycle repair services • Employer or association-sponsored vanpool, circulator, or shuttle • Rideshare program • Provide a guaranteed ride home service to users of non-auto modes
Shared Mobility	• Provide car-sharing, bike sharing, and ride-sharing programs • Shift single occupancy vehicle trips to carpooling or vanpooling by providing ride-matching services or shuttle services • Other shared mobility devices • School carpool program
Neighborhood Enhancement	• Orient the project toward transit, bicycle, and pedestrian facilities • Improve pedestrian or bicycle networks • Include secure bike parking and showers • Traffic calming • Shared use paths

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 and land use context. Generally, with each additional measure implemented, a VMT reduction is achieved, but the incremental benefit of VMT reduction may diminish.

Additional data may be needed to quantify the effects of combining TDM strategies and their effectiveness for a given project and land use context. 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. The project applicant should coordinate with the County CDRA and/or DPW staff to determine appropriate VMT reduction strategies to consider and the appropriate method for calculating their effectiveness.

Additionally, mitigation measures may become acceptable as project applicants and agencies continue to innovate and find new ways to reduce vehicular travel. For example, the Technical Advisory notes that because VMT is largely a regional impact, regional VMT-reduction programs (e.g., VMT bank/exchange programs) may be an appropriate form of mitigation.

Significant and Unavoidable Impacts

Projects that have a significant impact that cannot be mitigated to a less than significant level must provide a detailed statement of overriding considerations and findings to support these considerations in accordance with CEQA Guidelines Section 15091 and 15093.

Multi-Modal Plan Consistency Assessment

The Transportation Study shall evaluate the project's potential adverse effects on transportation facilities and services related to vehicles, transit, bicycles, and pedestrians. The evaluation should consider whether the project would physically disrupt an existing transit, bicycle, or pedestrian facility or service. Similarly, the evaluation should determine whether the project would interfere with the implementation of a planned transit, bicycle, or pedestrian facility or service. This effort will require identifying and mapping existing and planned facilities, and then determining whether the proposed project would cause any changes to those facilities.

Specific analytical topics related to transit, bicycle, and pedestrian that should be included in a CEQA impact assessment are further described below.

Transit Analysis

The transit analysis shall include a description of existing transit facilities nearby and how the project could affect transit facilities and service. The description and analysis of transit facilities will vary for each project depending on the existing and planned transit service and ridership in the project area. At a minimum, the Transportation Study should provide the following information:

- A qualitative description of transit service in the project area, including local bus service, regional bus or rail service (such as Amtrak), or shuttle service, where provided.
- A map showing fixed-route transit service within two miles of the project site.
- Information on route operations, including hours of operations, time between stops of transit vehicles (headways), vehicle capacities, and load factors (i.e., a capacity analysis based on passenger counts).
- Information on transit stops near the project site, such as bus stop locations, bus turn-outs, shelters, benches, etc.

Project effects on the transit system should be evaluated in consideration of system performance standards established by the transit operator, and may include the following:

- Increased potential for disruption of existing transit service or interference with the implementation of a planned transit facility.
- Increased travel time for buses that could adversely affect on-time performance.
- Increased transit ridership demand that results in passenger loads that exceed vehicle loading standards.
- Increased potential for safety conflicts involving transit vehicles and other modes of travel.

If the project has an impact on transit, feasible mitigation measures must be identified. The project applicant and transportation analyst should coordinate any identified transit improvements with Placer County Transit, Tahoe Truckee Area Regional Transit, and/or Sacramento Regional Transit (SacRT). For example, the project should consider transit priority treatments when the analysis determines on-time performance is adversely affected. The project should consider accommodating transit stops to serve existing or proposed transit services, including those identified in an applicable Short Range Transit Plan, Community/Area Plan, Specific Plan, Transit Systems Plan, and/or Regional Transportation Plan for the study area.

The project applicant should coordinate with Placer County Transit, Tahoe Truckee Area Regional Transit, and/or SacRT, as applicable, to determine additional or upgraded transit stop amenities.

Bicycle Analysis

The description and analysis of bicycle facilities will vary for each project depending on the availability and usage. It is expected that urban and suburban locations will have more pedestrian and bicycle travel facilities and will require more detailed analysis than rural

locations. At a minimum, the Transportation Study shall provide the following information:

- A map showing existing and planned bicycle facilities in the study area.
- A description of different bicycle facility types. The Placer County Regional Bikeway Plan should be consulted for a description of the facility types.
- A discussion of bicycle and pedestrian access between the project site, nearby transit stops, and land uses that generate a high number of pedestrians or bicyclists.
- A qualitative discussion based on observations of bicycle and pedestrian activity in the study area and at study area intersections.
- A description of bicycle parking in the Project vicinity, which may include location, type and usage of bicycle parking (racks, lockers, etc.)
- Graphics showing pedestrian and bicycle volumes in the study area and/or at study area intersections, if available.

Project effects on existing and proposed bicycle facilities should be reviewed in consideration of the following:

- Bicycle analysis should primarily focus on bicycle connectivity, bikeshed analysis, presence of adequate facilities, etc. For example, the project results in a significant number of bicycle trips on a roadway that does not have adequate bicycle facilities, such that there may be a potential for increased conflicts between bicyclists and other modes of travel.
- Conflict or interfere with implementation of bicycle projects identified in the Placer County Regional Bikeway Plan and/or applicable Community/Area Plan.
- On-site bike parking supply and provision of end-of-trip support facilities.

The project should construct or reserve space for any planned bicycle facility that is identified in the Placer County Regional Bikeway Plan, or applicable Community/Area Plan or Specific Plan, that would be used by project traffic so that the project supports (and does not interfere with) the future implementation of a planned bicycle facility.

The project should also consider upgrading existing adjacent bicycle facilities by adding upgraded treatments (such as green bike lane paint, buffers, etc., where appropriate) to accommodate an increase in bicycle demand and address potential multi-modal conflicts between vehicles and bicycles.

Pedestrian Analysis

The Transportation Study should include a qualitative description of existing pedestrian facilities in the project vicinity. This would consist of identifying the location of sidewalks, any existing gaps in pedestrian travel networks, and the level of usage.

Pedestrian analysis should primarily focus on pedestrian connectivity, walkshed analysis, presence of adequate facilities, etc. For example, would the project result in a significant increase in additional pedestrian trips where there is a lack of adequate pedestrian facilities (i.e., sidewalk, trail, crosswalk, etc.) to support those trips.

The project should construct sidewalks to close sidewalk gaps adjacent to the project site. The project should consider adding traffic calming and pedestrian-related signal timing changes (such as pedestrian hybrid beacons, leading pedestrian interval signal timing, etc.) to accommodate an increase in pedestrian demand on roadways and intersections adjacent to the project site and address potential multi-modal conflicts between pedestrians and other modes of travel.

Additional Considerations

Particular attention should be made to roadway or intersection widening improvements that address vehicle traffic flow. These improvements may increase pedestrian/bicycle crossing times or increase the potential for vehicle and pedestrian/bicycle conflicts, in addition to potentially inducing vehicle travel that should be accounted for in the CEQA VMT impact assessment. Consideration should also be given to how a project affects accessibility between each travel mode and the surrounding land uses.

For some projects, more detailed quantitative multi-modal analysis may be required. In these cases, the methodology shall be selected in consultation with County staff.

Hazards & Safety Assessment

The Transportation Study should identify any transportation hazards or safety concerns within the project's study area, consistent with CEQA. The project site plan should be reviewed for the following:

- The project would create a condition that does not meet current design standards.
- The project would substantially increase hazards to vehicle, bicycle, or pedestrian safety due to geometric design features (e.g., sharp curves or dangerous intersections)

- The project introduces incompatible users (e.g., farm equipment) to a roadway or transportation facility not intended for those users.

Additionally, Caltrans has issued interim guidance on safety review for the State Highway System. The transportation analyst should coordinate with DPW and Caltrans staff to identify any additional areas of safety analysis required for the project. If applicable, analysis of freeway interchanges should include analysis of off-ramp queuing. Transportation Studies should normally document changes in off-ramp maximum queues and propose mitigation for queues that spill back onto the freeway mainline or exacerbate queues that already or are projected to spill back beyond the gore point onto the freeway mainline.

Chapter 5: Local Transportation Assessment

This chapter provides the analysis procedures for conducting the LTA of the Transportation Study for land development projects in Placer County. The methodology presented in this section includes analysis of off-site traffic operations, safety, and on-site circulation.

Off-Site Traffic Operations Assessment

This section describes the traffic operations analysis methodologies, procedures, and standards. Off-site traffic operations must be analyzed to demonstrate consistency with LOS policies contained in the Placer County General Plan and other applicable documents.

Traffic Operations Data Collection

Accurate data is essential to achieve a high level of confidence in transportation analysis results. Existing traffic conditions data should be collected using the guidelines set forth in Table 4.

Table 4: Baseline Conditions Data Collection Protocol	
Data Set	**Procedure**
Peak period turning movement counts	Collect data for all study intersections on a Tuesday, Wednesday, or Thursday during weeks without holidays, large special events, or heavy construction in the study area that results in temporary travel pattern shifts. Typically, autumn or spring days without rain and when school is in session are preferred. • Care should be taken to collect data on days when schools are in session. • Consult with the County to determine if adjustments are necessary to account for seasonal variation in traffic volumes. • Traffic counts shall not be used if more than two years old at study initiation. If available, County counts may be used but the traffic counts must be adjusted to reflect current year traffic volumes and patterns. • Bicycles and pedestrians should be included in all counts where bicycle/pedestrian activities are present. • Some projects may require vehicle classification or occupancy counts. Consult with the County on a case-by-case basis. Alternative data collection procedures may be considered for projects that have unique temporal or seasonal travel characteristics. The County may also consider utilization of traffic count estimates from mobile device data vendors.
Roadway geometrics	Document existing geometrics from a combination of aerial photography, as-built plans, and site visits.
Travel time and speed	Only as necessary. Collect data using a floating car survey or through speed data provided by a mobile device data vendor.
Signal timing	Request timing from the County and other operating agencies such as Caltrans or adjacent local jurisdictions (i.e., incorporated cities). Verify timing in the field.
Collision data	Obtain County data from DPW staff and Statewide Integrated Traffic Records System (SWITRS) through the local California Highway Patrol or through the following Web site: www.chp.ca.gov/switrs. For study areas that include state highway facilities, collision data should be requested from Caltrans Traffic Accident Surveillance and Analysis System (TASAS) branch.
Mode split	Summarize daily and peak hour mode split from study area or communities adjacent to study area. Data sources could include the Census journey-to-work survey, the SACOG household travel survey, or other available surveys.
Transit routes and use	Map existing transit routes serving the study area and identify stops, service hours, and levels of use. Document amenities (benches, shelters, bicycle parking, etc.) available at transit stops and centers within ¼-mile of non-residential projects and a ½-mile of residential projects.

Table 4: Baseline Conditions Data Collection Protocol	
Data Set	**Procedure**
Bicycle and pedestrian facilities	Map existing bicycle and pedestrian facilities within the study area (include sidewalks, crosswalks, signal heads, push buttons, related signing and striping). Document barriers, deficiencies and high-pedestrian demand land uses including schools, parking, senior housing facilities, and transit stops or centers. Consider using evaluation tools such as www.walkscore.org or similar tools to quantify walkability.

In addition, the following information may be necessary in calibrating the traffic analysis tools used to analyze traffic operations.

- If the project is a redevelopment project with existing uses in operation at the time that the transportation data is collected and the proposed project will terminate the existing use, the trips associated with the existing use should be calculated by conducting driveway counts at all existing site driveways. The site trips should then be distributed to the study intersections and subtracted from the intersection traffic counts to represent the traffic volumes that would be present if the existing use were not in operation.

- Observations of maximum vehicle queues during the study period

It is strongly recommended that the transportation analyst conduct field reconnaissance to support the documentation of existing conditions in the study area.

Generally, a Transportation Study is applicable as long as the traffic volumes in the vicinity of the project have not changed significantly. After two or more years of inactivity, DPW may require the applicant to conduct a supplemental Transportation Study.

Roadway Network Description

The Transportation Study shall provide a map that shows the project site and identifies transportation facilities in the study area. The Transportation Study shall provide a brief description of the study area roadways near the site. At a minimum, the Transportation Study should state the number of travel lanes, direction of travel, the extents of each roadway, posted speed limits, and the relation to the project site. The Transportation Study can also describe typical street cross-sections and other aspects of the streets such as on-street parking, bicycle and pedestrian facilities, median treatment, speed limit, etc. For

State Highway facilities, the latest available traffic counts near the Project site should also be reported[4].

Where relevant, a Transportation Study should document roadway features such as sight distance, intersection lane configurations, presence of closely spaced or offset driveways or intersections, and/or uneven lane utilization.

Trip Generation

Project applicants may be required to submit a vehicle trip generation estimate that identifies the number of new daily and peak hour vehicle-trips added by the proposed project to confirm whether the project would meet the trigger for a Transportation Study. This initial vehicle trip generation estimate may also be used during the scoping of a Transportation Study as described in these guidelines.

The vehicle trip generation estimation for all new or proposed development projects shall include the summation of primary trips and diverted linked trips. Figure 2 illustrates trip types relevant to trip generation and the difference between the total trips generated by the project versus new trips added by the project.

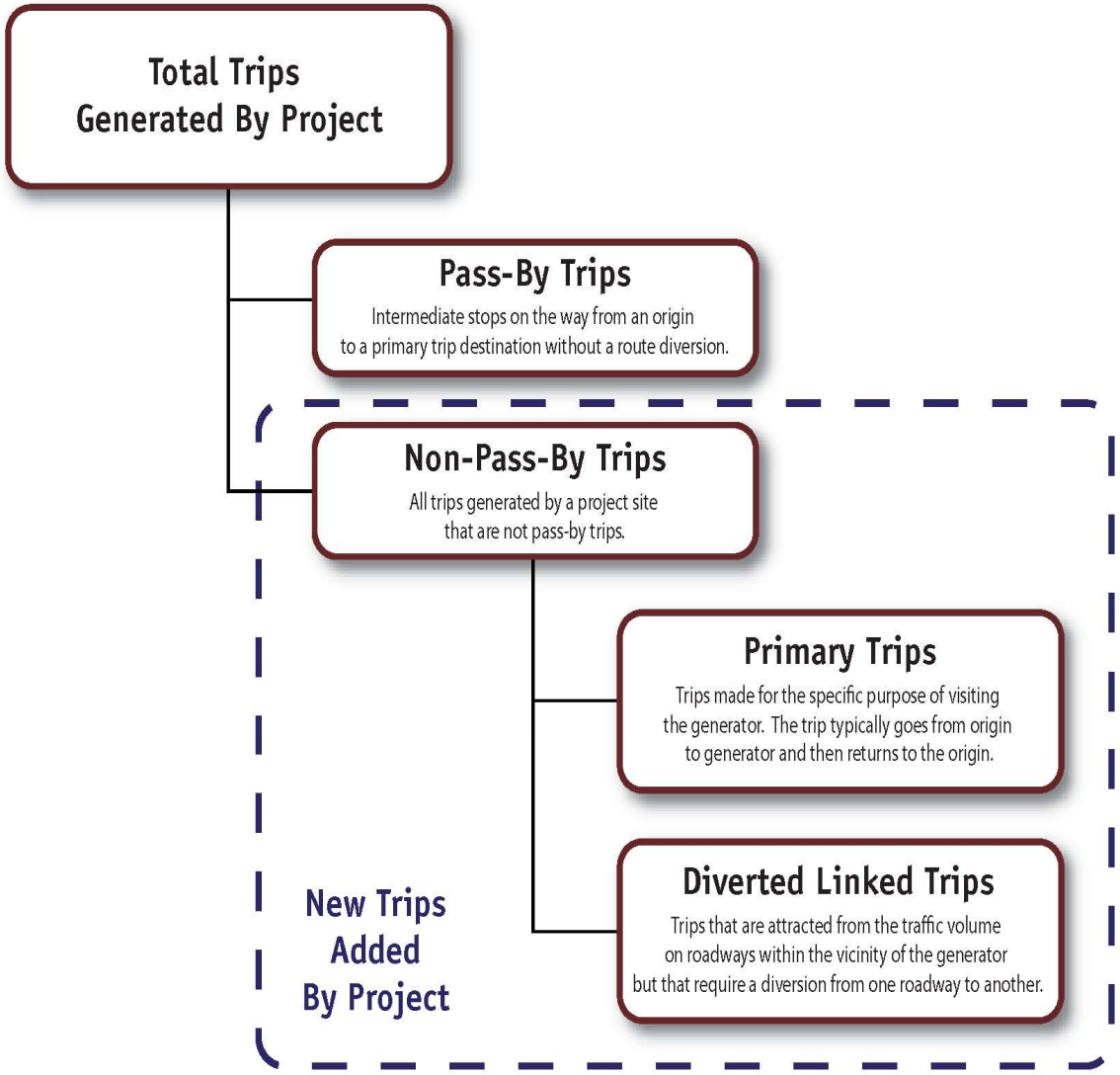
The estimation of new trips generated by the proposed development project may include credit for trips associated with existing uses on the site. Existing uses are typically those actively present on the project site at the time data is gathered for the Transportation Study. The final estimate of new daily and peak-hour trips associated with a proposed development project should represent the net contribution of the proposed project.

Trip generation analysis should follow guidance contained in the ITE *Trip Generation Handbook*.[5] Most projects may use trip generation data from the most recent version of the ITE *Trip Generation Manual*[6]. If the data in the *Trip Generation Manual* is insufficient, trip generation analysis should be based on rates derived from local empirical data, following guidance in the *Trip Generation Handbook*. If multiple trip generation rate sources exist, the study shall provide a comparison and use the rates that best reflect local conditions and applicable regulatory constraints.

[4] Refer to the Caltrans Performance Measurement System (PeMS) website or other relevant sources.

[5] *Trip Generation Handbook, 3rd Edition*, Institute of Transportation Engineers, Washington, D.C., 2014
[6] *Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2017

Figure 2: Trip Generation



The project trip generation rate should not be based solely on one nearby or similar land use facility, unless approved by DPW staff. The sample used for non-standard trip generation rates shall include at least three similar facilities in Placer County or neighboring jurisdictions with similar characteristics, unless approved by DPW staff.

If the study involves comparable sites located in other communities, the applicant must demonstrate to the satisfaction of the County that the sites and uses to be studied are reasonably equivalent to the site and use proposed within the County.

The final trip generation rates used for the project should be a weighted average of the various trip generation rates available. A tabular summary of the final trip generation rate calculation shall be provided.

Traffic Operations Analysis

Vehicle traffic operations analysis shall be analyzed using standard or state-of-the-practice procedures consistent with the latest edition of the Highway Capacity Manual (HCM) published by the Transportation Research Board. This traffic operations analysis will result in an evaluation of LOS conditions at specified intersections, roadways, and State Highway facilities within the Study Area. This LOS analysis will primarily be used to determine local roadway improvements, and per Public Resource Code §21099, subdivision (b)(2), will not constitute a significant impact on the environment under CEQA.

Analysis Parameters

Analysis parameters (e.g., signal phasing, conflicting pedestrian volumes, etc.) for Baseline and Baseline Plus Project conditions shall be based on field measurements taken during traffic count collection or field observation. Near-Term and Cumulative scenarios may require modifications to represent changes anticipated over time.

For new study intersections and under cumulative conditions, Table 5 provides guidance on state-of-the-practice procedures. Consult with the County regarding other analysis parameters not listed in Table 5.

Table 5: Analysis Parameter Recommendations

Parameter	Recommendation
Peak hour factor (PHF)	• Use measured average PHF for the intersection obtained through traffic data collection for baseline and near-term scenarios. For cumulative scenarios and baseline conditions where peak hour factors are not available, refer to the most recent HCM. • If a simulation model is used for analysis, the PHF should be applied for the peak 15-minute period. For the remaining analysis periods, if used, the volume should be adjusted to match the total hourly volume.

Conflicting pedestrians for signalized intersections and roundabouts	Should be based on existing pedestrian counts or observations. Otherwise, refer to the most current version of the HCM to determine the amount of pedestrian activations per cycle into appropriate categories.
Traffic signal cycle lengths	Replicate existing cycle length and phasing (e.g., leading left turns) when possible for Baseline and Near-Term conditions. For new signals and Cumulative conditions, optimize the cycle length based on traffic demand and ensure that minimum pedestrian crossing times are satisfied per the most recent version of the California Manual on Uniform Traffic Control Devices (MUTCD).
Heavy truck percentages	Based on the existing heavy-truck percentage and adjusted to account for future planned development. In general, heavy-truck percentages should be greater on truck routes and main thoroughfares than on local streets. Minimum recommended value is 2%.

Analysis Tools and Methods

Traffic operations analysis for state highways and local roadways shall be conducted using tools and methods approved by Placer County DPW staff. The following section identifies traffic operations software programs that have been vetted by County staff.

Signalized Intersections

Traffic operations at signalized intersections shall be analyzed using standard or state-of-the-practice procedures consistent with the latest edition of the HCM. At isolated intersections that are not heavily congested, deterministic methods that apply HCM equations for each intersection in isolation can be used. There are several software packages that use deterministic methods such as Synchro, Vistro(previously called Traffix), and Highway Capacity Software (HCS). Generally, Placer County DPW prefers Synchro for intersection traffic operations analysis, but other tools or methods (including Vistro and HCS) may be used upon receiving approval from DPW staff.

For intersections that are closely spaced, have a unique geometry, experience high-levels of multi-modal interaction (i.e., high-levels of pedestrian, bicycle, or transit vehicle volumes interacting with automobiles), or are part of a congested corridor, microsimulation analysis should be performed. Additional information about microsimulation benefits and the selection of the appropriate microsimulation software is provided in the Microsimulation Analysis section below.

Unsignalized Intersections

Traffic operations at unsignalized intersections (all-way stop, side-street stop, and roundabout intersections) shall be analyzed using standard or state-of-the-practice procedures consistent with the latest edition of the HCM.

Operational analysis should be reported as follows:

- Roundabouts: Delay and corresponding level of service reported for the entire intersection as an average value.
- All-way stop intersections: Delay and corresponding level of service reported for the entire intersection as an average value.
- Side-street stop intersections: Delay should be calculated as an overall weighted average for movements that yield the right-of-way with the corresponding level of service reported.

The software packages and methods described for signalized intersections also apply to stop-controlled intersections. The SIDRA Intersection software may also be considered for analyzing operations at roundabouts. The LOS for roundabouts shall be determined using the HCM delay LOS thresholds for unsignalized intersections.

The Transportation Study shall include a signal warrant analysis consistent with methodologies outlined in the most recent California Manual on Uniform Traffic Control Devices (MUTCD) for unsignalized intersections that operate (or are projected to operate) at an LOS that does not meet County standards as determined by LOS policy(s) in the Placer County General Plan and/or an applicable Community/Area Plan. The applicable MUTCD signal warrants shall be determined in consultation with Placer County DPW Transportation staff.

Microsimulation Analysis

The County may require the use of microsimulation modeling for congested conditions as recommended by the HCM. Since microsimulation tools can simultaneously evaluate vehicle interactions across a complete network (including the interaction of multiple travel modes, such as automobiles, bicycles, pedestrians, and transit vehicles), they can provide a more complete understanding of traffic operating conditions during peak congested periods and what may happen when a specific bottleneck is modified or eliminated.

Microsimulation can also more accurately evaluate intersections with unique characteristics or in congested systems because the method accounts for how intersections within a system interact with one another. For example, if a vehicle queue extends from an intersection and blocks a different intersection, microsimulation will account for that condition, whereas deterministic methods that apply the HCM in isolation will not. Microsimulation should also be considered when determining required turn lane storage if the transportation analyst believes deterministic methods are not producing reasonable maximum or 95th percentile queue lengths. There are several microsimulation software packages to consider, such as SimTraffic (which is a module of Synchro) and Vissim. It is recommended that the method and software proposed for use is coordinated with County DPW staff as part of the study initiation process.

State Highway System Analysis

In Placer County, the analysis of state highways could include nearby freeways, multi-lane arterials and highways, and two-lane highways. Freeway analysis will typically include basic freeway segments, ramp junctions, weaving sections, and ramp terminal intersections. HCM methods shall be used for basic freeway segments, ramp junctions, and ramp terminal intersections, but Caltrans has alternative analysis methods for weaving sections as defined in the Caltrans *Highway Design Manual* (HDM Section 504.7). The Caltrans District 3 traffic operations branch should be consulted before beginning any analysis of the State Highway System.

In analyzing ramp terminal intersections, the transportation analyst should consider that these intersections are closely spaced in most cases and operate as an integrated set versus as isolated locations. Analysis of freeway interchanges should include off-ramp queuing spillbacks onto freeway mainline. Transportation Studies should normally document changes in off-ramp maximum queues and propose mitigation for queues that spill back onto the freeway mainline or exacerbate queues that already or are projected to spill back beyond the gore point onto the freeway mainline. Freeway interchange analysis should be coordinated with Caltrans.

Roadway Segment Analysis

Vehicle traffic flow on local roadway segments in urban and suburban areas is generally dictated by the traffic operations at intersections. However, traffic demand on roadway segments should be evaluated for the purpose of appropriately sizing roadways. Planning-level documents may report existing and forecasted average daily traffic (ADT) values and compare them to roadway capacity standards, based on state of the practice methodologies.

If required by DPW staff, Transportation Studies would include project-level roadway segment analysis if the project has the potential to exceed the capacity of the roadway segment and the roadway is not yet constructed to its full cross section, as identified in a planning level document. Roadway segment analysis at the project level should utilize the methodologies contained in the latest version of the HCM. The analysis will be used to determine if the project triggers a planned roadway improvement and to assist in logical implementation of roadway improvements.

Methodology of Assessment

Placer County strives to achieve traffic conditions on the County roadway network that are consistent with the level of service (LOS) policies shown in the Placer County General Plan, Community/Area Plans, and Specific Plans. However, the County acknowledges that some roadways and intersections may operate just within or below the County's LOS policies. This results in limited available roadway and/or intersection capacity for small increases in traffic volumes without causing traffic conditions that are inconsistent with County LOS policies. The Placer County General Plan and some Community/Area Plans and Specific Plans further acknowledge the need to balance LOS goals with other community values, and in some cases establish less robust LOS targets in some communities to minimize roadway expansion, encourage multi-modal travel, and reduce long-term maintenance and operations costs.

Additionally, the County has established the Impact Analysis Methodology of Assessment memorandum, contained in Appendix D. The memo describes Placer County's methodology of assessment for traffic operations. The methodology should be applied in conjunction with the applicable LOS standards described in applicable planning documents.

Off-Site Intersection Improvements

When a project is responsible to address a traffic operations deficiency as described above, the Transportation Study should consider the effect of feasible TDM or trip reduction measures on vehicle delay at intersections before considering physical capacity enhancements. If the CEQA impact assessment determines the project would have a significant VMT impact requiring mitigation, the TDM or trip reduction measures identified as mitigation should be considered and included in the LOS analysis.

If physical improvements to the roadway network are necessary to address an LOS deficiency, the transportation analyst should refer to the County's CIP to determine if the required improvements are funded through the County's Traffic Mitigation Fee Program or other regional fee programs. If the improvements are required for the Cumulative Plus Project scenario only and are already included in the CIP, payment of the fee may be considered the project's fair share towards the needed improvements.

If the required improvements are not addressed in a fee program, the transportation analyst shall consider the following improvements and recommend a feasible improvement.

Signalized Intersections

- Signal Timing Improvements/Signal Modifications:
    - Types of signal improvements that can be considered are:
        - Updating signal split times
        - Transit signal priority improvements
        - Right turn overlap phasing
        - Signal phasing changes
        - Intelligent Transportation Systems (ITS) improvements
- Adding or lengthening a turn lane:
    - Considerations for intersection improvements:
        - When considering intersection improvements for circulation, access, and safety for all modes, factors that should be considered include, but are not limited to, conflicting pedestrian movements, existing and proposed bicycle facilities, transit priority, protected or permissive turn movement phasing, number of lanes, speed of prevailing traffic and expected queue lengths.
    - Left Turn Lane:

- No Existing Left-Turn Lane: If the project adds traffic to an individual left turn movement causing the total number of peak hour left turns to exceed 100, consider adding a left turn lane.[7]
- Existing Single Left-Turn Lane: If the project adds traffic to an individual left turn movement causing the total number of peak hour left turns to exceed 300, consider adding a second left turn lane.

◦ Right Turn Lane:

- No Existing Right-Turn Lane: If the addition of a right turn lane will not negatively affect other roadway users, will maintain a comfortable roadway environment, AND the project adds traffic to an individual right turn movement causing the total number of peak hour right turns to exceed 500, consider adding a right turn lane.

◦ Lengthening a Turn Pocket:

- If the project adds traffic to a turning movement and causes the 95th percentile queue to exceed the available turn pocket length, consider lengthening the turn pocket.

- If the addition of turn lanes or signal timing improvements/modifications are insufficient to offset the project's impact on traffic operations, additional through travel lanes may be considered under the following conditions:
  - The additional through travel lanes are consistent with the ultimate roadway cross section identified in the County General Plan and/or applicable Community/Area Plan or Specific Plan
  - The widening would not substantially increase the potential for vehicle and pedestrian/bicycle conflicts
  - The widening would not substantially affect pedestrian/bicycle safety for travel through the intersection
  - The additional travel lanes secondary effects on VMT (i.e., induced travel) should be considered as part of the CEQA impact assessment

[7] FHWA, *Signalized Intersections: Informational Guide*, August 2004. This source also provides additional factors which can be used to determine the need of a single left turn lane or additional left turn lanes including, left-turn volumes on the major and minor approaches, number of lanes, and vehicles per hour.

Unsignalized Intersections

- Considerations for intersection improvements:
    - When considering intersection improvements for circulation, access, and safety for all modes, factors that should be considered include, but are not limited to, conflicting pedestrian movements, existing and proposed bicycle facilities, transit priority, number of lanes, speed of prevailing traffic and expected queue lengths.
- Constructing a roundabout or traffic signal at an all-way stop-controlled intersection:
    - If the project causes the operations at an all-way stop-controlled intersection to degrade, perform an intersection control evaluation that includes an MUTCD signal warrant analysis and a roundabout LOS analysis.
    - Prepare a roundabout conceptual layout (prepared by a consultant qualified/experienced in roundabout design) to determine the geometric impact of a roundabout.
    - Coordinate with the Placer County DPW Transportation staff on appropriate intersection control improvement. Staff may request additional lifecycle safety and mobility analysis.
- Improvements to a roundabout intersection:
    - If the project causes the operations at a roundabout intersection to degrade, determine improvements to the roundabout to reduce vehicle delay, such as metering traffic during peak hours, adding a right turn bypass lane, or multilane segments within the roundabout.
    - If these improvements are insufficient, perform an intersection control evaluation that includes an MUTCD signal warrant analysis to determine whether the intersection is a candidate for signalization.
    - Coordinate with the Placer County DPW Transportation staff on appropriate intersection control improvement. Staff may request additional lifecycle safety and mobility analysis.

Safety Assessment

Transportation safety is an ongoing focus for Placer County. The County maintains a collision data analysis system that is updated and reviewed on an annual basis. Through the County's safety program, locations for detailed engineering investigations are identified and improvements to facilitate safe travel for all modes are implemented on a regular basis, if necessary.

The transportation analyst shall consult with DPW staff to determine if the project would affect a location that is currently the subject of a detailed safety investigation (or an investigation completed in the last 3 years that identified continued evaluation). If a safety evaluation is determined to be necessary with the project, the Transportation Study should indicate whether the proposed project would adversely impact safety, safety actions, or safety projects identified in an applicable transportation safety plan/analysis. If so, the project applicant should coordinate with DPW staff to determine appropriate improvements, if necessary.

On-Site Circulation Assessment

A detailed site review is required for every project that triggers a Transportation Study. Consideration should be given to the following qualitative and quantitative reviews and summarized in the Transportation Study:

- Existence of any current traffic issues in the project area that may affect access to/from the project site or on-site circulation, such as unique or non-standard roadway, intersection or driveway configurations, vehicle queuing that impact site access, multi-modal conflicts, etc.
- Project site design includes frontage improvements consistent with County requirements.
- Applicability of context-sensitive design practices compatible with adjacent neighborhoods or other areas that may be impacted by the project traffic.
- Proximity of proposed site driveway(s) to other driveways or intersections.
- Adequacy of the project site design to fully satisfy truck loading demand on-site, when the anticipated number of deliveries and service calls may exceed 10 per day.
- Adequacy of the project site design to provide sufficient storage for 95th percentile queues at project driveways.
- Adequacy of the project site design to convey all vehicle types.
- Adequacy of on-site vehicle, bicycle, and pedestrian circulation and provision of safe pedestrian paths from residential areas to school sites, public streets to commercial and residential areas, and the project site to nearby transit facilities.
- Project site design resulting in inadequate emergency access or response times.

Appendix A – Relevant General Plan Goals and Policies

This appendix lists relevant goals and policies from the Placer County General Plan that apply to the development of a Transportation Study. Refer to the Placer County General Plan for a full list of transportation goals and policies. The transportation analyst should refer to the Community/Area Plan and/or Specific Plan for additional policies, if applicable.

Streets and Highways – Goal 3.A: To provide for the long-range planning and development of the County's roadway system to ensure the safe and efficient movement of people and goods.

Policies:

3.A.1 The County shall plan, design, and regulate roadways in accordance with the functional classification system described in Part I of this Policy Document and reflected in the Circulation Plan diagram.

3.A.2 Streets and roads shall be dedicated, widened, and constructed according to the roadway design and access standards generally defined in Section 1 of this Policy Document and, more specifically in community plans, specific plans, and the County's Highway Deficiencies Report (SCR 93). Exceptions to these standards may be considered due to environmental, geographical, historical, or other similar limiting factors. An exception may be permitted only upon determination by the Public Works Director that safe and adequate public access and circulation are preserved.

3.A.3 The County shall require that roadway rights-of-way be wide enough to accommodate the travel lanes needed to carry long-range forecasted traffic volumes (beyond 2010), as well as any planned bikeways and required drainage, utilities, landscaping, and suitable separations. Minimum right-of-way criteria for each class of roadway in the County are specific in Part I of this Policy Document.

3.A.7 The County shall develop and manage its roadway system to maintain the following minimum levels of service (LOS), or as otherwise specified in a community or specific plan.

a. LOS C on rural roadways, except within one-half mile of state highways where the standard shall be LOS D.

b. LOS C on urban/suburban roadways except within one-half mile of state highways where the standard shall be LOS D.
c. A LOS no worse than specified in the Placer County Congestion Management Program (CMP) for the state highway system.

Temporary slippage in LOS C may be acceptable at specific locations until adequate funding has been collected for the construction of programmed improvements.

The County may allow exceptions to the level of service standards where it finds that the improvements or other measures required to achieve the LOS standards are unacceptable based on established criteria. In allowing any exception to the standards, the County shall consider the following factors:

- The number of hours per day that the intersection or roadway segment would operate at conditions worse than the standard.
- The ability of the required improvement to significantly reduce peak hour delay and improve traffic operations.
- The right-of-way needs and the physical impacts on surrounding properties.
- The visual aesthetics of the required improvement and its impact on community identity and character.
- Environmental impacts including air quality and noise impacts.
- The impacts on general safety.
- The impacts of the required construction phasing and traffic maintenance.
- The impacts on quality of life as perceived by residents.
- Consideration of other environmental, social, or economic factors on which the County may base findings to allow an exceedance of the standards.

Exceptions to the standards will only be allowed after all feasible measures and options are explored, including alternative forms of transportation.

3.A.9 The County shall strive to meet the level of service standards through a balanced transportation system that provides alternatives to the automobile

3.A.11 The County shall require an analysis of the effects of traffic from all land development projects. Each such project shall construct or fund improvements necessary to mitigate the effects of traffic from the project consistent with Policy 3.A.7. Such improvements may include a fair share of improvements that provide benefits to others.

3.A.13 The County shall assess fees on new development sufficient to cover the fair share portion of that development's impacts on the local and regional transportation system.

Exceptions may be made when new development generates significant public benefits (e.g. low income housing, needed health facilities) and when alternative sources of funding can be identified to offset foregone revenues.

Transit / Alternative Modes of Transportation – Goal 3.B To promote a safe and efficient mass transit system, including both rail and bus, to reduce congestion, improve the environment, and provide viable non-automotive means of transportation in and through Placer County.

Policies:

3.B.1 The County shall work with transit providers to plan and implement additional transit services within and to the County that are timely, cost-effective, and responsive to growth patterns and existing and future transit demand.

Transportation Systems Management (TSM) – Goal 3.C To maximize the efficient use of transportation facilities so as to: 1) reduce travel demand on the County's roadway system; 2) reduce the amount of investment required in new or expanded facilities; 3) reduce the quantity of emissions of pollutants from automobiles; and 4) increase the energy-efficiency of the transportation system.

Policies:

3.C.1 The County shall promote the use of transportation systems management (TSM) programs that divert automobile commute trips to transit, walking, and bicycling.

3.C.2 The County shall promote the use, by both the public and private sectors, of TSM programs that increase the average occupancy of vehicles.

3.C.4 During the development review process, the County shall require that proposed projects meet adopted Trip Reduction Ordinance (TRO) requirements.

Non-Motorized Transportation – Goal 3.D: To provide a safe, comprehensive, and integrated system of facilities for non-motorized transportation.

Policies:

3.D.1 The County shall promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provides connections between the County's major employment and housing areas and between its existing and planned bikeways.

3.D.5 The County shall continue to require developers to finance and install pedestrian walkways, equestrian trails, and multi-purpose paths in new development, as appropriate.

3.D.7 The County shall, where appropriate, require new development to provide sheltered public transit stops, with turnouts.

3.D.8 The CDRA Engineering and Surveying Division and the Department of Public Works shall view all transportation improvements as opportunities to improve safety, access, and mobility for all travelers and recognize cycling, pedestrian, and transit modes as integral elements of the transportation system.

3.D.11 The County shall work to achieve equality of convenience and choice among all modes of transportation – pedestrian, cycling, transit and motor vehicles, through a balanced and interconnected transportation system.

Appendix B – Placer County's SB 743 Approach for Projects under CEQA

MEMORANDUM

TO: Current and Future Applicants

FROM: Environmental Coordination Services Division

DATE: November 10, 2020

SUBJECT: Placer County's SB 743 Approach for Projects under CEQA

At the beginning of 2019, updated California Environmental Quality Act (CEQA) Guidelines went into effect. The new Guidelines require CEQA lead agencies such as Placer County to transition from using "level of service" (LOS) to "Vehicle Miles Traveled" (VMT) as the metric for assessing transportation impacts under CEQA. The state's requirement to transition from LOS to VMT is aimed at promoting infill development, public health through active transportation, and a reduction in greenhouse gas emissions. Pursuant to the Guidelines, any project that did not initiate CEQA public review prior to July 1, 2020 must use VMT rather than LOS as the metric to analyze transportation impacts. LOS will still be used by the County for purposes of determining consistency with general plan and community plan goals and policies but is no longer used for determining significant impacts under CEQA.

Staff has prepared this guidance memo to help applicants understand the County's current approach to SB 743 by project type. The approach has been shaped based on the following goals:

1. Facilitate growth in Placer County
2. Comply with the requirements of SB 743
3. Strive to achieve the GHG reduction measures outlined in the Placer County Sustainability Plan
4. Relatively simple to understand and administer

The County realizes that it may be difficult for individual projects to mitigate VMT impacts on their own. As such, the County will strive to address potential VMT impacts at a community-level by evaluating strategies and mitigation measures to better connect transportation and land use. Land use strategies should strive to match the development of housing with places of employment, retail, recreational, and entertainment uses and be sensitive to unique rural and suburban contexts throughout the County. They should also align with strategic initiatives adopted by the Board of Supervisors to create a diversity of achievable housing, develop outcome-focused economic development strategies, and provide land use planning and environmental stewardship. This strategic land use match will reduce trips within the County; and therefore, minimize VMT.

The County will continue to work with stakeholders to envision development for the future, while striving to meet local, regional, and statewide goals. This vision should align with the Placer County General Plan, Housing Strategy and Development Plan, Placer County Sustainability Plan, and other adopted plans to meet the needs of the community.

The intent of these guidelines is to outline the County's approach for how various types of projects will be analyzed for their transportation impacts. The approach may change over time as court rulings, state guidance or new information is gathered to promote the goals of the program and to adhere to State law.

Because Placer County has a considerable amount of land currently planned for development but not yet in the construction phase, for the purposes of this guidance memo, potential projects have been divided into three major categories: Category 1: projects within a previously-approved Specific Plan Area; Category 2: projects within a previously-approved Community/Area Plan; and Category 3: all other projects. These three major categories are further defined below.

Category 1: Projects Within a Previously Approved Specific Plan Area

There are two possible scenarios for projects that fall within a previously approved Specific Plan Area. These include:

1. Projects consistent with their entitlements
2. Projects proposing a Specific Plan Amendment

Projects moving forward that are wholly consistent with their land use entitlements require no further CEQA analysis. These projects are entitled and may develop consistent with those entitlements.

Projects requesting a Specific Plan Amendment must be considered on a project-by-project basis relative to SB 743 and the County's VMT guidance. These projects must go through the standard CEQA process pursuant to Guidelines Section 15162 to determine whether substantial changes are anticipated due to the proposed amendment which will require additional analysis due to the involvement of new significant environmental effects.

If additional VMT analysis is warranted, the modified project proposal will be evaluated against the anticipated VMT allocated with the Specific Plan Area land use entitlements for the property/area in question using Project Types 1-3 defined below (in Category 3) or against the County's adopted VMT threshold(s), as determined by staff. If a proposed land use change increases VMT beyond that allocated with the Specific Plan or beyond the County's VMT threshold(s), then the change will be considered potentially significant. If the land use change results in lower or equal VMT generation than the previously approved project or if the amended project remains under the County's VMT threshold(s), then the impact will be considered less than significant.

Category 2: Projects Consistent with Their Currently Approved Community Plan/Area Plan

Existing Community Plan areas have approved land uses. Projects consistent with these land uses can rely on their previously approved environmental review if it includes a VMT analysis. There are currently only two Community Plans or Area Plans that include a VMT analysis: the Sunset Area Plan and the Tahoe Basin Area Plan. If a proposed project is consistent with its Community Plan that has an approved VMT analysis then the project

requires no further VMT analysis; however, applicants may be required to provide evidence that a Project's VMT is consistent with the approved Community Plan. Projects that fall within a community plan area that does not include a VMT analysis or projects that are not consistent and seek changes to Community Plans will be required to analyze potential transportation (i.e., VMT) impacts as outlined in "Category 3: All Other Projects" below.

Category 3: All Other Projects

County staff will review proposed projects to determine what level of VMT analysis may be required. The level of analysis will be determined based on the project's characteristics, such as type, size, location, etc. Typical projects in unincorporated Placer County will fall into one of three types based on their individual characteristics:

Type 1: Projects consistent with adopted screening criteria
County staff will initially review projects to determine whether they meet Placer County's adopted screening criteria. If a project meets the screening criteria, County staff recommends that no further transportation analysis is necessary unless there are special circumstances to the project. If a project meets the applicable screening criteria, the transportation impacts of the project would likely be deemed less than significant and no mitigation for VMT impacts would be required.

Screening criteria include the following project types:

- Small projects generating under 110 average daily trips or 880 daily VMT
- Deed-restricted affordable housing and below-market rate housing in East Placer (unincorporated areas east of Donner Summit, excluding the Tahoe Basin)
- Locally serving retail and other locally serving uses, generally defined as projects under 50,000 square feet
- Projects located in low VMT-generating areas

Projects that are generally consistent in size and land use type compared to their surrounding built environment will have similar VMT values to the existing land uses near the project site. As a result, if a proposed project is located within a low VMT-generating area *and has similar features to the surrounding area* it will likely not result in substantial increases in VMT/capita or other efficiency metrics. Placer County is currently developing the Placer County VMT estimation tool that will assist in determining if the project is in a low VMT generating area, see Type 2 below.

Refinement of the screening criteria and eligible project types may occur over time.

Type 2: Projects that qualify to use the Placer County VMT estimation tool

The Placer County VMT estimation tool will assist project applicants with determining if their project is located in a low VMT generating area. Projects that are in low VMT generating areas may be screened out, without further analysis as discussed above. Typically, projects that are generally consistent in size and land use type compared to their surrounding built environment may use the VMT estimation tool to determine if they are in a low VMT generating area. Projects may

also use a qualitative assessment, supported by substantial evidence, to demonstrate no potentially significant impacts.

The VMT estimation tool will be a web-based tool that project applicants and transportation consultants can access through the County's website. The project applicant will enter basic information about the project into the tool, including location, size, proposed land uses, etc. The tool will estimate the project's VMT based on other existing land uses nearby. The tool will also allow the project applicant to test mitigation measures, if needed.

If the estimation tool determines no potentially significant impact, then the project VMT analysis is complete. If the estimation tool determines there is a potentially significant VMT impact, an applicant can revise the project or propose mitigation which would reduce the potentially significant impact to less than significant. If modification or mitigation of the project's impact to a less than significant level is not feasible, the project would be required to complete a full VMT Analysis (see Type 3 below) and/or prepare an EIR. Findings as to why the County should override the significant and unavoidable impact will be required in support of a project approval.

Type 3: Projects that require a full VMT analysis

At the discretion of the County, larger, more complex and/or controversial projects will not be able to take advantage of the streamlining steps outlined above. Instead, these projects will be required to complete a full project-specific VMT analysis using the current SACOG travel demand model (SACSIM) or TRPA Travel Demand model or other tool, as approved by DPW staff, to determine a project's VMT impacts. These models will predict the project's VMT impact. The applicant will be expected to mitigate any project specific impacts related to VMT to the highest extent possible, either through project modification or feasible mitigation. If modification or mitigation of the project's impacts to a less than significant level is not feasible, the project would be required to prepare an EIR. Findings as to why the County should override the significant and unavoidable impact will be required in support of a project approval.

Additional Information

It is important to note that agencies statewide are grappling with how to comply with SB 743. As noted above, it is possible that experience gained by Placer County through implementation of the law as well as the outcome of anticipated court rulings may result in modification to the county's approach. Therefore, while this memo is intended to provide stable guidance on Placer County's approach to complying with SB 743; the County's approach may evolve over time.

It is also important to note that an analysis of LOS may still be required by the County in order to ensure a project is consistent with General Plan and/or Community Plan policies (i.e., to determine whether intersection and/or roadway segment improvements are required as a result of the project). Further, projects remain subject to the Placer County traffic fee program, as applicable.

If you have any questions regarding this guidance, please contact Leigh Chavez with Environmental Coordination Services (530.745.3077), Nikki Streegan with Planning (530.745.3577) or Katie Jackson with the Department of Public Works (530.745.7521). You can also find information regarding the new CEQA transportation metric on the State's Office of Planning and Research (OPR) website at http://www.opr.ca.gov/ceqa/updates/sb-743/. For project-specific inquiries, please contact your project's lead planner.

Sincerely,

LEIGH CHAVEZ
Principal Planner/Environmental Coordinator

cc: Steve Pedretti, Director – Community Development Resource Agency
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Appendix C – VMT Thresholds & Screening Criteria Justification

To implement SB 743, Placer County has developed local VMT thresholds and screening criteria. The VMT thresholds contained in this document will be employed for evaluation of discretionary projects in unincorporated Placer County under CEQA, beginning immediately upon adoption by the Board of Supervisors. The thresholds were developed after thorough technical analysis and outreach performed by County staff and technical experts, Fehr & Peers. The thresholds were selected based on their ability to align with the legislative intent of SB 743 and the County's goals and policies. This document contains the substantial evidence used to establish VMT thresholds unique to Placer County.

Senate Bill 743 – Legislative Intent

The legislative intent, as defined in SB 743, directs lead agencies 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 (GHG) emissions."*

The legislative intent does not specifically require a jurisdiction to meet the State's goals on GHG emissions or VMT reduction, but instead tasks local agencies with coming to a "more appropriate balance" of the various objectives stated above. This justification document will demonstrate how the County's VMT thresholds are consistent with the legislative intent and County's goals and policies.

OPR's Recommended Thresholds Are Not Appropriate for Placer County

The Technical Advisory recommends a VMT threshold of 15% below the regional or citywide average for residential and office land uses. According to OPR, the term regional refers to the Metropolitan Planning Organization (MPO) boundary where the project is located. However, the recommended thresholds are not appropriate for Placer County because they do not achieve the full legislative intent of SB 743, and would result in unwanted and unintended consequences, as described in this section.

The Technical Advisory recommends thresholds based on claims that it would be achievable in a variety of place types and that it would help the State achieve its climate goals. The Technical Advisory cites data supporting this threshold from two documents authored by the California Air Resources Board (CARB): *2017 Scoping Plan – Identified VMT Reductions and Relationship to State Climate Goals* (CARB, January 2019) and *2016 Mobile Source Strategy* (CARB, May 2016). CARB's reports examine statewide data on GHG emissions and outlines a scenario that could result in achievement of the State's climate goals by 2030 and 2050. GHG production from mobile sources, including VMT, is just one of a number of factors that play into the formula for GHG reduction strategies to achieve the State's Climate Goals.

OPR doesn't provide evidence as to why the regional or citywide average is appropriate for thresholds. In fact, the CARB *2017 Scoping Plan* and *2016 Mobile Source Strategy* only references statewide VMT. There is no evidence that regional VMT is more or less appropriate than any other geography (i.e. RTPA, countywide, sub-region, etc.). Therefore, lead agencies should decide the most appropriate geography for use.

Recommended Thresholds Do No Meet Full Legislative Intent

The thresholds recommended by OPR are based solely on GHG emissions reductions, without regard for the full legislative intent of SB 743. CEQA already requires assessment of GHG emissions in a separate section, so the environmental effects of GHG emissions are already disclosed.

There is no evidence connecting OPR's recommended thresholds for new development projects to promotion of public health through active transportation or promotion of infill development. In fact, the County's active transportation network and infill development would be hindered by adoption of OPR's recommended thresholds. Active transportation projects (i.e. bike facilities and pedestrian facilities) are primarily constructed and funded by new development and grant funds. Development projects are required to construct frontage improvements, including active transportation components. Also, development impact fees often serve as the local match funding that is required for many grant programs which might construct active transportation facilities. Without new development projects, which may be hindered by the recommended threshold, implementation of these alternative infrastructure improvements may be significantly hindered.

As further evidence of the effect of OPR's recommended thresholds, the County conducted an analysis of parcels that meet the State's definition of infill development under SB 35. An infill project could be eligible for screening if it were to locate in a Traffic Analysis Zone (TAZ) with VMT less than the adopted threshold. None of the TAZ's in Placer

County would be defined as low-VMT areas under OPR's thresholds for Household VMT/capita; only four TAZ's would fall under OPR's thresholds for Work VMT/employee. Only two infill parcels are in low VMT areas and could be eligible for screening, representing only 4% of the County's total infill parcels. Without the ability to screen out infill developments, they will be required to perform detailed VMT analysis. In most cases, a full EIR would likely be required, because these infill parcels would not be able to reduce VMT to less than significant levels due to unachievable thresholds and few feasible mitigation measures. OPR's recommended thresholds would create further roadblocks for active transportation and infill development, which is contrary to SB 743's legislative intent.

OPR's thresholds also disregard the language of SB 743, where it calls on local agencies to "*more appropriately balance* the needs of congestion management with statewide goals…" (emphasis added). The thresholds suggested by OPR are intended to advance the statewide goals on GHG reduction, but do not attempt to achieve a balance between climate goals and congestion management. Each lead agency has the authority to develop its own unique solutions to this challenge, instead of adopting the Technical Advisory recommendations that present a one-size-fits-all approach.

Recommended Thresholds will Result in Unintended Consequences

Model data demonstrates there are zero TAZ's in unincorporated Placer County that would currently achieve the threshold of 15% below regional average for Household VMT/capita and only four TAZ's would fall under that threshold for Work VMT/employee. OPR's recommended thresholds, combined with relatively few feasible mitigation measures would have unintended consequences in Placer County, including:

- Requiring most projects to prepare an environmental impact report to analyze and disclose impacts measured against an unattainable regional threshold.
- Lengthening review process for most projects, including new housing that could help address the State's current housing crisis.
- Hindering near-term development of housing in areas with lower land costs under existing land use plans.
- Promoting development of very small subdivisions that fall under the recommended screening criteria, rather than comprehensive land use plans and modifications to local land use regulations that can bring jobs and housing closer together.
- Hindering development of new businesses and jobs in suburban and rural areas, that could bring Placer County's jobs/housing balance into better alignment.

- Measuring VMT against areas where the County has no authority or control over transportation and land use decisions.

Placer County Supports SB 743 Legislative Intent

Placer County has numerous goals, policies, plans, and programs that further the legislative intent of SB 743. Placer County has worked to balance congestion management with reduction in GHG emissions, promotion of infill development and development of active transportation facilities. The County's commitment to these initiatives dates back many decades, as demonstrated by the following goals and policies contained in the Placer County General Plan (Adopted August 1994, Updated May 2013).

Balance Congestion Management

- **Transportation Goal 3.A.** To provide for the long-range planning and development of the County's roadway system to ensure the safe and efficient movement of people and goods.

- **Transportation Policy 3.A.9.** The County shall strive to meet the level of service standards through a balanced transportation system that provides alternatives to the automobile.

- **Transportation Goal 3.B.** To promote a safe and efficient mass transit system, including both rail and bus, to reduce congestion, improve the environment, and provide viable non-automobile means of transportation in and through Placer County.

- **Transportation Policy 3.B.9.** The County shall require development of transit services by ski resorts and other recreational providers in the Sierra to meet existing and future recreational demand.

Reduce GHG Emissions

- **Transportation Goal 3.C.** To maximize the efficient use of transportation facilities so as to: 1) reduce travel demand on the County's roadway system; 2) reduce the amount of investment required in new or expanded facilities; 3) reduce the quantity of emissions of pollutants from automobiles; and 4) increase the energy-efficiency of the transportation system.

- **Transportation Policy 3.C.2.** The County shall promote the use, by both the public and private sectors, of TSM programs that increase average occupancy of vehicles.

- **Transportation Policy 3.C.3.** The County shall work with other responsible agencies to develop other measures to reduce vehicular demand and meet air quality goals.

- **Transportation Policy 3.C.4.** During the development review process, the County shall require that proposed projects meet adopted Trip Reduction Ordinance (TRO) requirements.

- **Housing Policy G-2.** The County shall promote land use patterns that encourage energy efficiency, to the extent feasible, and encourage efficient energy use in new development, including but not limited to access to non-auto transit, use of traffic demand management, and water-efficient landscaping.

Encourage Active Transportation

- **Land Use Policy 1.B.7.** The County shall require residential subdivisions to be designed to provide well connected internal and external street and pedestrian systems with clear, unobstructed pedestrian paths of travel.

- **Transportation Policy 3.C.1.** The County shall promote the use of transportation systems management (TSM) programs that divert automobile commute trips to transit, walking, and bicycling.

- **Transportation Policy 3.D.1.** The County shall promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provides connections between the County's major employment and housing areas and between its existing and planned bikeways.

- **Transportation Policy 3.D.5.** The County shall continue to require developers to finance and install pedestrian walkways, equestrian trails, and multi-purpose paths in new development, as appropriate.

- **Transportation Policy 3.D.7.** The County shall, where appropriate, require new development to provide sheltered public transit stops, with turnouts.

- **Transportation Policy 3.D.8.** The CDRA Engineering and Surveying Division and the Department of Public Works shall view all transportation improvements as opportunities to improve safety, access, and mobility for all travelers and recognize cycling, pedestrian, and transit modes as integral elements of the transportation system.

- **Transportation Policy 3.D.11.** The County shall work to achieve equality of convenience and choice among all modes of transportation – pedestrian, cycling,

transit and motor vehicles, through a balanced and interconnected transportation system.

Promote Infill Development

- **Land Use Policy 1.A.4.** The County shall promote patterns of development that facilitate the efficient and timely provision of urban infrastructure and services.

- **Land Use Policy 1.B.2.** The County shall encourage the concentration of multi-family housing in and near downtowns, village centers, major commercial areas, and neighborhood commercial centers.

- **Economic Development Policy 1.M.1.** The County shall concentrate most new growth within existing communities emphasizing infill development, intensified use of existing development, and expanded services, so individual communities become more complete, diverse, and balanced.

- **Economic Development Policy 1.N.2.** The County shall encourage the retention, expansion, and development of new businesses, especially those that provide primary wage-earner jobs, by designating adequate land and providing infrastructure in areas where resources and public facilities and services can accommodate employment generators.

- **Housing Policy A-5**. The County shall facilitate the development of higher-density multi-family development in locations where adequate infrastructure and public services are available by permitting residential uses in commercial zones, allowing flexible development standards, and providing other incentives.

Placer County has various programs, plans, and initiatives already in place that achieve the legislative intent of SB 743. The following programs are a sample and demonstrate the County's commitment to balancing the multiple objectives of SB 743.

- **Placer County Sustainability Plan (PCSP):** This document serves as a GHG emission reduction plan and climate adaptation strategy. The PCSP contains the County's comprehensive approach to reduce GHG emissions through 60+ reduction strategies that span multiple sectors, including transportation. The Plan puts Placer County on track to reduce GHG emissions 20% below 2005 levels by the end of 2020 and strives to reduce emissions though 2030 and beyond. The PCSP brings multiple benefits to Placer County, including lower energy costs, reducing air and water pollution, supporting local economic development, and improving public health, safety, and quality of life. (Adopted January 2020)

- **Placer County Conservation Program (PCCP):** The PCCP is a unique habitat conservation program, recently adopted by Placer County. The program covers over 200,000 acres of western Placer County, with roughly 50,000 acres becoming part of a conservation reserve system. The PCCP minimizes and mitigates the impacts of growth on covered and natural communities and covered species. The program also serves to establish a long-term footprint for planned growth and conservation. (Adopted August 2020)

- **Placer County Transit (PCT) and Tahoe-Truckee Area Regional Transit (TART):** PCT and TART provide fixed route bus service throughout the County and to adjacent communities. PCT serves western Placer County including commuter service to downtown Sacramento. TART serves the greater Resort Triangle area, including the Town of Truckee, Tahoe Basin, and areas in between. TART is currently implementing a two-year free-fare pilot program to increase transit ridership, which initially resulted in 19% more ridership, before the COVID pandemic.

- **Trip Reduction Ordinance (TRO):** The TRO was adopted with the intent to reduce total vehicle emissions in Placer County by reducing the number of single occupancy vehicles for commute trips. The fundamental objective is to increase the average vehicle ridership by requiring employers to encourage employees to use alternative transportation modes. Employers with over 100 employees at a single site are required to compile a transportation plan identifying the transportation control measures in place at their work location. (Adopted July 1993)

- **Placer County Regional Bikeway Plan:** The Plan identifies a vision and goals for bicycling, a network of bikeways to connect the county, and supportive programs and practices to encourage bicycling in Placer County. Improving connections for bicyclists provides additional choices to people traveling, provides new links to key destinations and communities, and can help support active lifestyles through increased physical activity. The Plan develops a regional system of bikeways that connects the six incorporated cities with numerous unincorporated communities. (Updated October 2018)

- **Transportation Demand Management Strategies for North Lake Tahoe:** The TDM uses policies, infrastructure improvements and programs to make it easier to travel without a vehicle for everyday trips. The TDM works with the existing transportation system to expand mobility options and accommodate future growth by effectively managing travel demands of a region through the promotion of biking, walking, scootering, taking transit, and carpooling. Additionally, TDM programs and tools promote more sustainable environmental, health, and community benefits. (Adopted July 2019)

- **Resort Triangle Transportation Plan:** The Plan strives to improve the transportation system so that it is adaptable and more resilient in serving the influx of visitors throughout the year. This is achieved though multimodal strategies that make the most of what currently exists, while strategically investing in improvements that enable reliable, efficient, travel options that broaden the travel choices beyond personal vehicles. (Adopted October 2020)

- **Housing Strategy and Development Plan:** The purpose of this plan is to conduct planning and research to augment affordable housing opportunities in Placer County, identify incentives and amend local regulations toward that effort, and identify critical funding and resources. This effort aligns with State and local planning priorities including to increase the availability of a mix of housing types, improve overall employment growth by resolving housing affordability issues that contribute to labor shortages, and reduce VMT by shortening commute distances for those who commute into Placer County for education or work, but who otherwise live elsewhere. The plan also identifies acceleration of infill development as a tactic to produce more housing by finding funding through infill infrastructure grant programs and evaluating infill incentives. (Adopted August 2017).

Placer County also participates in regional planning efforts through the Sacramento Area Council of Governments (SACOG). Most notably, this includes periodic updates of the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). The MTP/SCS achieves state goals with regard to GHG reduction expectations for the land use and transportation sector by reducing GHG emissions by 19 percent, consistent with the target set by CARB. This corresponds to a 7.8 percent reduction in household VMT per capita for the region and 11.7 percent reduction in household VMT per capita for unincorporated Placer County through 2040. As such, the County's plans and programs, combined with regional efforts to improve land use and transportation efficiency demonstrate efforts to help achieve the State's climate goals.

Placer County VMT Thresholds

Placer County has established the thresholds in Chapter 4 of the Transportation Study Guidelines for evaluation of discretionary projects. The thresholds for Placer County were selected based on their ability to align with the legislative intent of SB 743 and CEQA statute while reflecting the local context and community values of Placer County as outlined in goals and policies of the Placer County General Plan.

This approach will encourage project applicants to build in VMT efficient areas and incorporate VMT reduction strategies into their projects. Additionally, use of the unincorporated average is appropriate, since that is the geography over which the County

has authority for land use and transportation decisions. In addition to the plans and programs listed above, the County's VMT thresholds align with the legislative intent of SB 743 in the following ways:

- **Infill Development:** The thresholds presented above facilitate more infill development than OPR's recommended thresholds. Unincorporated Placer County has limited opportunity for infill development, as defined by SB 35. Of the parcels that meet the State's criteria for infill, 53% would fall into low-VMT generating areas, under Placer County's thresholds. As stated above, under OPR's recommended thresholds only 4% of the infill parcels would be in low VMT generating areas. As a result, the County's VMT threshold would better facilitate infill development by streamlining the VMT analysis and demonstrating a less than significant impact. Furthermore, modeling data indicates VMT levels are generally higher in rural areas of the County and the use of the Countywide average would encourage development in the South Placer area and within established communities, thereby achieving the goal of promoting development in existing communities close to goods and services.

- **Promotion of public health through active transportation:** Active transportation opportunities are achievable in Placer County, despite low-density development in the rural areas. Facilitation of new development will further expand active transportation facilities through completion of frontage improvements, including sidewalks and bike lanes and payment of impact fees which fund improvements identified on the Placer County Regional Bikeway Plan, TRPA's Active Transportation Plan, and various community plans.

- **Reduction of GHG emissions:** The thresholds encourage development of areas near existing goods and services, resulting in shortened trip lengths, lower VMT, and reduced GHG emissions. Generally, the thresholds would dissuade projects in rural areas that result in longer trip lengths. Use of the unincorporated County average will be harder to achieve in rural areas. VMT reduction is difficult in rural areas, where people are highly dependent on vehicles for work, shopping, and recreation trips. Additionally, the screening criteria would only screen out small or low VMT projects within Placer County. Under the GHG thresholds adopted by the Placer County Air Pollution Control District, all of the projects identified under the County's small project screening criteria would fall under the GHG De Minimis level, meaning that the projects would be presumed to have less than significant GHG and VMT impacts.

Furthermore, these local thresholds do not interfere with the State's ability to achieve climate goals. The State has tools and options available to achieve GHG goals across a wide range of industries. Unincorporated Placer County is expected to grow by approximately 40,500 people between 2016 and 2040, according to the 2020 MTP/SCS. During that same time period, the State of California is expected to grow by 4.6 million

people (DOF, 2019 Projections). Placer's growth represents less than 1% of the overall State population growth during that period. Additionally, unincorporated Placer County's estimated VMT growth represents just 5% of the total VMT growth over the six-county SACOG region, according to modeling data from the 2020 MTP/SCS. As such a small proportion of the State's overall growth, VMT in Placer County is unlikely to hinder the State's ability to achieve its climate goals.

The County's thresholds also align with the overall intent of CEQA, as defined in Public Resources Code Section 21001 (d) and (e):

- *"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."*
- *"Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations."*

While the OPR recommended thresholds represent an unattainable standard that would make it challenging to develop the County's active transportation network and streamline infill development, the County's thresholds are designed to better achieve the intent of CEQA and SB 743 at the local level, especially when combined with the County's existing and on-going plans and programs.

Screening Criteria Justification

VMT impact assessment can be divided into three different categories: 1) project screening, 2) a simplified calculation tool or qualitative assessment and 3) complete modeling analysis. The purpose of the screening criteria is to determine if a project is likely to result in less than significant VMT impacts, without requiring a complete VMT analysis. OPR's Technical Advisory provides some recommended screening criteria; however, each jurisdiction that chooses to adopt screening criteria has discretion to establish their own approach.

The screening criteria that has been adopted by Placer County may apply to the following project types: small projects, affordable housing, local serving uses, and projects in low VMT generating areas. This section documents the justification for each screening criteria.

Small Projects: Defined as projects that generate less than or equal to 110 average daily trips or 880 daily VMT. The types of projects that generate under 880 daily VMT, based on

data from the Institute of Transportation Engineers (ITE) Trip Generation Manual and Placer County trip lengths include the following:

- 17 or fewer single family dwelling units
- 22 or fewer multi-family dwelling units
- 10,000 square feet or less of office uses
- 22,200 square feet or less of light industrial uses
- 63,200 square feet or less of warehouse uses

OPR's Technical Advisory recommends a minimum project size for VMT analysis of 110 average daily trips (ADT). This is based on a categorical exemption in CEQA for additions to existing structures up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area (CEQA Guidelines, section 15301, subdivision. (e)(2). Based on ITE trip generation rates, OPR calculates that an office building of this size has the potential to generate approximately 110 ADT and makes a reasonable conclusion that a project generating less than 110 ADT could be considered not to lead to a significant impact.

There are two potential problems with using OPR's recommendations: it results in a relatively low minimum project size for which a VMT analysis is required and it is not based on VMT. The minimum project is relatively low, especially compared to criteria that some agencies use for LOS-based traffic impact studies. The OPR recommendation could result in substantial analysis cost burdens for very small projects. Additionally, OPR's recommendation is not based on VMT and therefore it is important to establish an alternative that identifies a minimum project size based on VMT.

As an alternative, Placer County proposes to expand this screening criteria based on local trip length data and the following methodology: OPR estimated that office uses could generate 110-124 daily trips based on a maximum project exemption size of 10,000 square feet. According to the 2012 California Household Travel Survey (CHTS) the average vehicle trip length for unincorporated Placer County is 8.0 miles. Using this data, the VMT equivalent of OPR's minimum project size is 880 daily VMT.

According to the CHTS, the typical household in Placer County generates 50.9 VMT on an average weekday. Therefore, 17 single family homes would generate 865.3 VMT, which falls below the small project screening criteria. Multi-family dwelling units generate fewer trips than single family dwelling units. Using ITE Trip Generation rates, 22 multi-family dwelling units would also fall below the small project screening criteria.

In order to calculate the other typical types of projects that would fall under 880 daily VMT in unincorporated Placer County, the average trip length (8.0 miles) was multiplied by the average trip rate per thousand square feet by land use (based on the ITE Trip Generation Manual), and then divided into 880 VMT. For example, a light industrial land use is expected to generate 4.96 trips per 1,000 square feet, the equivalent project size based on local trip length data would equal 22,200 square feet. The table below shows the calculations for the types of projects that are expected to generate under 880 daily VMT.

Equivalent Project Size in Placer County			
Land Use (ITE Code)	**Average Trip Rate (per KSF)**	**Equivalent Project Size (square feet)**	**Daily VMT Estimate**
Retail (820)	37.75	2,900	876
Office (710)	9.74	11,300	880
Light Industrial (110)	4.96	22,200	880
Warehouse (150)	1.74	63,200	880

Notes: KSF = thousand square feet of gross floor area. All calculations assume an average trip length of 8.0 miles. Average Trip Rate from ITE Trip Generation Manual, 10th Edition.

The advantage of this alternative for determining minimum project size is that it is based on CHTS data that cites trip lengths and VMT generation per household in unincorporated Placer County. The data is from well-established sources utilized by transportation engineers and planning professionals to determine the effect of projects on the transportation system. These data sources have provided information for projects in unincorporated Placer County and received wide acceptance from the transportation profession, decision makers, and the public.

Furthermore, unincorporated Placer County, excluding the Tahoe Basin, currently generates approximately 5.6 million VMT on a typical weekday, according to the Sacramento Area Council of Governments (SACOG) travel demand model. The SACOG region generates approximately 123 million VMT per day. The screening criteria of 880 daily VMT represents 0.02% of all VMT occurring in unincorporated Placer County today. Therefore, the screening criteria does represent a small project, relative to existing VMT levels.

Under the GHG thresholds adopted by the Placer County Air Pollution Control District, all of the projects identified under the County's small project screening criteria would fall under the GHG De Minimis level, meaning that the projects would be presumed to have less than significant GHG impact.

Affordable Housing: Defined as deed-restricted affordable housing in unincorporated Placer County or Below Market Rate Housing in the East Placer region (unincorporated areas east of Donner Summit), excluding Tahoe Basin

Placer County recommends a conclusion of less than significant for VMT impacts for deed-restricted affordable housing throughout the County or Below Market Rate Housing in the East Placer region, excluding the Tahoe Basin. At this time, this screening criteria includes the unincorporated areas east of Donner Summit, excluding the Tahoe Basin because a collaborative effort is currently underway with the Tahoe Regional Planning Agency, and VMT screening criteria specific to the Tahoe Basin will be adopted at a later date. While the following justification can be applied to the Tahoe Basin, the screening criteria currently applies outside of the Tahoe Basin.

According to the Truckee North Tahoe Regional Workforce Housing Needs Assessment (August 2016), "As a widely recognized domestic and international tourism destination, the Truckee and North Tahoe region faces a broad spectrum of complex housing issues. As in many resort and visitor-oriented communities, large seasonal fluctuations in retail and service-oriented employment, as well as a visitor-oriented real estate market, create a disconnect between the needs of the regional labor force and the housing resources that are made available by the market." Based on this analysis and initiatives by the Mountain Housing Council, a variety of different housing types are needed to accommodate a range of incomes for the Tahoe Region.

While OPR has recommended inclusion of deed-restricted affordable housing, due to the unique housing demands in the East Placer region, Placer County has expanded the criteria to include additional housing and income types for this region. One housing concept, referred to as Achievable Local Housing, targets income level as the key criteria for housing development. Achievable Local Housing is a term adopted in 2017 by the Mountain Housing Council to describe the range of housing needs in the North Tahoe Truckee region with a spectrum of needs ranging from those having no income (i.e. homeless) up to middle income earners (i.e. 195% of the area median income).

The Tahoe Regional Planning Agency later adopted Achievable income limits for each county in the Tahoe Basin. For Placer County, Achievable income limits are defined as 245% area median income or below for single family dwellings and 220% area median income or below for multifamily dwellings. The term Below Market Rate Housing refers to housing types that are leased or sold at prices that are below the current market value. Such units may, or may not, feature deed-restrictions that limit occupancy to income qualifying households (i.e., income-restricted) (Common Housing Terms & Definitions, Mountain Housing Council

Toolkit). This housing type is included in the screening criteria because it is created for local workforce by-design.

The following findings were made according to the Truckee North Tahoe Regional Workforce Housing Needs Assessment, which demonstrate the need for housing to support the region's workforce:

- An analysis of population and household characteristics show that low-income households (with incomes 80 percent or less of the area median) account for around 36.6 percent of all households, while moderate-income households (with incomes of 80 to 120 percent of the area median) account for another 18.3 percent.

- Renter households are significantly more likely to be lower-income and the lowest ownership rates and lowest median income estimates are in Soda Springs and Kings Beach communities (both in unincorporated Placer County).

- In an evaluation of economic and workforce trends, it was found that an estimated 58.6 percent of workers commute in from outside of the Truckee North Tahoe Region, while 46.6 percent live in the area but commute out of these areas for work.

- Workforce housing demand estimates reflect demand from existing residents, non-residents (in-commuter), and seasonal work households and, as such, illustrate a mismatch between the available housing stock and the types of housing that may best suit the needs of the workforce.

- Of the below market rate rental housing complexes in the Truckee North Tahoe Region, all reported zero vacancies and waiting times ranging from six months to two years. Demand is reportedly coming from area employees.

According to the *Analysis of Proposed Eastern and Western Placer County Voluntary Deed Restriction Programs* (BAE Urban Economics, August 2020), the average worker in the Eastern County that lives outside of that area travels approximately 38.8 miles each way for work, or 79.6 miles per workday. By comparison, the average distance traveled by workers who live within the Eastern County is 4.8 miles each way, or 9.6 miles per workday. The research also finds that the unincorporated areas between Donner Summit and North Lake Tahoe have experienced declining availability in the existing housing supply alongside increased housing costs due to the purchase of housing for second homes or short-term rental use. Additionally, the BAE study made the following conclusion,

> Moderate-income households [up to 120% AMI] in the Eastern County would struggle to purchase market rate for-sale housing, including either single-family or condominium units. The estimated gap between what moderate-

income households can afford to pay and market rate single-family housing prices ranges from $141,840 for a two-person household to $577,961 for a five-person household. The difference is notably lower for condominium units, ranging from $3,840 for a two-person household to $355,461 for a five-person household.

The issues of housing affordability, availability, and proximity as compared to job availability highlights a negative impact on VMT that could be resolved by creating more affordable housing in the East Placer. Based on the commute trip data above, the availability of housing closer to the jobs in East Placer means that worker households who relocate into this area could potentially reduce their daily commute by an average of 70 miles per workday, thereby reducing VMT.

Additionally, data collected by the Sacramento Area Council of Governments (SACOG) in the 2018 Regional Household Travel Survey supports these conclusions. The study surveyed trip making characteristics of households in the SACOG region, including Placer County. The data indicates that lower income households generate fewer person trips than high income households, and that low income households take the fewest numbers of trips by passenger car and are most likely to use alternative modes, like walking, bicycling, and transit.

Based on the Truckee North Tahoe Housing Needs Assessment and the VMT data above, if more Below Market Rate Housing were developed where there is a need, additional workforce could be accommodated and trips derived from housing outside of the region could be shortened in the North Tahoe Region. Based on the discussion above, these projects are presumed to have a less than significant impact on VMT. Therefore, Placer County has expanded the OPR recommendation for deed-restricted affordable housing and has provided the evidence in this section to include Below Market Rate Housing for the Tahoe Region.

***Local Serving Non-residential Uses**:* Defined as local serving non-residential projects, generally under 50,000 square feet.

OPR's Technical Advisory notes that retail projects tend to redistribute existing shopping trips, rather than create new trips. Local serving retail projects can serve to shorten trip lengths for existing trips, thereby reducing VMT. This reasoning holds true for a variety of local serving uses, beyond retail projects. Local serving land uses provide more opportunities for residents and employees to shop, dine, and utilize services closer to home and work. Local serving uses can also include community resources that may otherwise be located outside of the local area.

Neighborhood or local serving uses are identified in several implementing zone districts within Placer County plans. These zone districts are designed to provide day-to-day convenience shopping and services for residents of the immediate neighborhood and include neighborhood commercial (C1), general commercial (C2), commercial planned development (CPD) zone, or Service Commercial (SC) zone districts. By improving the proximity of a destination, local serving uses lead to shortened trip lengths and reduced VMT. Therefore, local serving uses may be presumed to have a less than significant impact on VMT. Many uses are allowed in zone districts that are designed to accommodate local services. The table below lists additional local serving uses that may be included as part of the screening criteria.

Examples of Local Serving Uses		
Local Serving Retail & Services	**Educational/Institutional**	**Public Services**
General retail	Public elementary school	Library
Grocery store	Public middle school	Civic Center
Restaurant/bar	Public high school	Police/Fire station
Laundries, dry cleaners	Community college	Community Center
Personal services such as barber, salon	Childcare center	Government support facility
Bank and financial services	House of worship	Community park
Medical/dental services		Post Office
Gas service station		Utility facilities (water, sewer, communication, etc.)
Gym, health club, fitness studio		

Note: Other local serving uses may be eligible for screening at the discretion of the Planning Director or his/her designee. Local serving uses are generally less than 50,000 square feet; however, substantial evidence may be used to establish whether a project over that size is local serving.

Projects located in low VMT generating areas: Maps of low VMT generating areas can be used to evaluate a proposed project. Projects that are generally consistent in size and land use type compared to their surrounding built environment (i.e. land use type, access to the circulation network, scale, etc.) will have similar VMT values to the existing land uses near the project site. If a project is located in a Traffic Analysis Zone (TAZ) with VMT per capita or VMT per employee that is less than or equal to the threshold established for that sub-region, then the project is considered to be located in a low VMT area and can be presumed to have a less than significant impact.

With the help of the Placer County map-based screening tool, users may identify the TAZ in which the project is located and determine whether the project is located in a low VMT area.

Recommended VMT Metric Definitions

Metric	Definition
Total VMT	• The vehicle miles traveled (VMT) of all vehicle-trips (i.e., passenger and commercial vehicles) assigned on the transportation network within a specific geographic boundary (i.e., model-wide, region-wide, city-wide).
Total VMT generated by a project	• The VMT of all vehicle-trips generated by a project; typically traced to the zone or zones in which a project is located. This includes trips that remain within a region (i.e., internal to internal (II)) as well as trips that leave or begin outside of the region (i.e., internal to external (IX) and external to internal (XI)). Travel modelers may use the final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims. When a travel model has multiple assignment periods, OD trip tables and congested skims from each period should be used.
Total VMT per service population	• Same method as above (Total VMT generated by a project) to estimate VMT and then divided by the population and employment of the zone or zones of study. If the travel model uses other person variables to generate vehicle trips from other sources such as students and visitors, then include those variables in the service population. Note that employment is often used as the independent variable for total vehicle trip generation associated with non-residential land uses. This means that vehicle trips made by people other than the employees are accounted for in the trip rate including visitors, customers, vendors, custodians, and delivery companies. For this reason, it is often difficult to draw conclusions about VMT patterns and use of the metric should be limited to analysis scenarios comparing full model runs typically focused on changes at the sub-regional, city, county, or regional scale. • Some trip-based travel models may not use population and employment as trip generation variables. Instead, they will rely on land use input variables. A 'correspondence' between the travel model land use input variables and population and employment rates is required for these types of models to convert land use inputs to population and employment.

Residential (or Household) VMT per resident	• All automobile (i.e., passenger cars and light-duty trucks) vehicle-trips are traced back to the residence of the trip-maker, even non-home-based trips. • Not applicable for trip-based models since non-home-based (NHB) trips aren't tied to the households making them. • Can be calculated either by averaging the daily VMT of all residents or by calculating total VMT, counting total residents, and dividing. • Allocation of responsibility within a jurisdiction (e.g., cities within a county) is straight-forward, since each trip is attached to a resident and each resident has a single home location. • Requires household size determination, which can be subject to debate for different housing types (i.e., single-family, multi-family, and age-qualified housing products). • Commercial vehicle trips (i.e., heavy-duty trucks) are not included. • A related metric is residential VMT per household – denominator is the total number of households instead of the total number of residents. The benefit of this metric form is that it doesn't require an estimate of household size.
Home-Based VMT per resident	• All home-based automobile vehicle trips are traced back to the residence of the trip-maker; non-home-based trips are excluded. • Similar to Total VMT per service population but excludes commercial vehicle trips.
Work VMT per employee	• All automobile vehicle-trips made by employed persons are traced back to the workplace of the trip-maker, even trips that aren't part of the work tour (i.e., all trips from home to work location and the return to home). • Commercial vehicle trips are not included. • Allocation of responsibility within a jurisdiction is straight-forward, since each trip is attached to a worker. But if some workers have multiple work locations then deciding which to count may be an issue.
Total VMT per land use unit (e.g., KSF)	• 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. Use trip estimates or trip tables multiplied by distance skims similar to total VMT generated by a project. The total VMT generated by a project is then divided by the land use input variable (e.g., dwelling unit, thousand square feet (KSF) of floor area, etc.).

Work Tour VMT per employee	• All automobile trips which are part of home-to-work tours or work-based tours are counted. Intermediate stops along the tour between home and work locations should not be used to truncate the total home-to-work tour distance. • Allocation of responsibility within a jurisdiction is straight-forward, since each tour or half-tour should be attached to a specific workplace. • Commercial vehicle trips are not included.
Home-Based Work (HBW) VMT per employee	• All automobile trips between home and work are counted. (A variant might also count work-based other trips.) • Allocation of responsibility within a jurisdiction should be straight-forward except for work-based other trips from one work location to another; even in this case it should be possible to decide which to count. • Commercial vehicle trips are not included.
VMT generated to/from/within a geography	• Vehicle trips with one or both trip-ends within the geographic area of interest are counted. (A variant might count only certain trip purposes.) Accounting can be used to isolate trip ends for assigning responsibility to specific jurisdictions. • Allocation of responsibility within a jurisdiction requires careful definition. For example, a trip from the City of Auburn to City of Roseville would be counted only once in the Placer County total and should appear in *both* the City of Auburn and the City of Roseville city totals. For this reason, this method doesn't allow you to calculate at a disaggregated level and then aggregate up to larger geographies. • Commercial vehicle trips can be included if desired and if data is available.

Appendix D – Impact Analysis Methodology of Assessment Memorandum

MEMORANDUM

DEPARTMENT OF PUBLIC WORKS AND FACILITIES
County of Placer

TO: Placer County Public Works DATE: September 30, 2015

FROM: Ken Grehm, Director

SUBJECT: **IMPACT ANALYSIS METHODOLOGY OF ASSESSMENT**

Placer County, along with surrounding jurisdictions, has experienced significant growth in recent years. The resulting traffic volume increases on County roadways and intersections have outpaced available roadway and intersection infrastructure construction activities. Achieving Level of Service (LOS) policy(s), as shown in the current Placer County General Plan, various Community Plans, and Specific Plans, remains the goal on all Placer County roadway facilities.

Due to overall decreases in operational efficiency and infrastructure construction timing throughout the County, some of the existing transportation networks are occasionally overburdened and traffic operations have declined. Development project proposals which would generate small amounts of new traffic are more and more often expected to fund large improvements because nearby roadways or intersections already operate just within or below the County LOS policies. Available roadway and/or intersection capacities for small increases in traffic volumes can be limited without relatively large infrastructure upgrade requirements. This can cause smaller development projects to become economically infeasible.

Placer County has developed the following methodology of assessment of project impact(s) for County roadway segments and/or intersections associated with LOS standards as defined in the General Plan, Community Plans, and Specific Plans within Placer County. The goal of this methodology of assessment is to ensure that project associated construction mitigation(s) are proportionate to the level of impact a specific project has on an intersection or roadway.

Traffic Impact Analysis:

If necessary, a traffic impact analysis shall be performed which includes the following analysis scenarios; Existing, Existing plus Project, Cumulative, and Cumulative plus Project. The project applicant/consultant shall consult with the Department of Public Works and Facilities prior to beginning the Traffic Impact Analysis (TIA) to finalize a scope of work.

Roadway Segment Assessment Methodology:

A project may be considered to exceed the minimum LOS policies if;

1) A roadway segment operating at or above the established Placer County policy without the project traffic trips will decrease to an unacceptable LOS with the project; **or**

2) A roadway segment currently operating below the established acceptable LOS policy will experience an increase in V/C (volume to capacity) ratio of 0.05 or greater with the project; **or**

3) A roadway segment currently operating below the established acceptable LOS policy experience an increase in ADT of 100 or more project generated trips, per lane.

Signalized Intersection Assessment Methodology:

A project may be considered to exceed the minimum LOS policies if;

1) An intersection operating at or above the established Placer County policies without the project traffic trips will decrease to an unacceptable LOS with the project; **or**

2) An intersection currently operating below the established acceptable LOS policy will experience an increase in the V/C (volume to capacity) ratio of 0.05 (5%) or greater; **or**

3) An intersection currently operating below the established acceptable LOS policy will experience an increase in overall average intersection delay of 4 seconds or greater.

Unsignalized Intersection Assessment Methodology:

A project may be considered to exceed the minimum LOS policies if;

1) An all way stop or side street controlled intersection, which currently operates at or above the established Placer County policies without the project, will deteriorate to an unacceptable LOS with the project and cause the intersection to meet MUTCD traffic signal warrant(s)[1] **or**

2) An all way stop or side street controlled intersection which currently operates below the established acceptable LOS policy and meets MUTCD signal warrant(s)[1] will experience an increase of 2.5 seconds[2] or more with the project.

Further consideration will be given in situations where the existing level of service is just above or at the approved minimum level of service and any increase in vehicle trips, or even daily fluctuations in traffic, will deteriorate the level of service to an unacceptable level. In such cases, it may be determined by the County that part (2) or (3) of the above exceptions is more applicable and should be used to analyze a proposed project's impacts.

1 Applicable MUTCD signal warrants to be determined in consultation with DPW Transportation staff. (2010 HCM)

2 Intersection delay for all-way stop intersections to be defined as the "overall intersection delay". Intersection delay for side street stop intersections to be defined as the "overall weighted average delay for movements yielding the ROW." (2010 HCM)

Attachment D

TRPA December 31, 2020 Memorandum to Melanie Sloan from Michael Conger re: Review of Screening Criteria for Vehicle Miles Traveled

https://www.trpa.org/wp-content/uploads/Attachment-D.-Review-of-Screening-Criteria-for-Vehicle-Miles-Travelled.pdf